"Drezner,Debbie"
<DDrezner@mwdh2o.com>
06/15/2010 02:08 PM

To <CAPSSolarNextEraFPL@blm.gov>
cc "Stites,Catherine M" <CStites@mwdh2o.com>
bcc
Subject Transmittal of comment letter regarding DEIS for NextEra Energy Resources Genesis Solar Energy Project

Allison Shaffer,

Please find attached, Metropolitan Water District of Southern California's comments regarding the subject DEIS. These comments have been submitted within the commenting deadline for the DEIS posted as July 8, 2010 pursuant to the April 9, 2010 Federal Register Notice (75 FR 18204). The original hardcopy of this letter is being sent to you via Federal Express.

Please feel free to contact me via return e-mail or by phone at (213) 217-5687 if you have any questions regarding our submittal.

Thank you,

Debbie Drezner
Environmental Planning Team
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, California 90054-0153 Genesis Solar comment letter.pdf

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

JUNE 15, 2010 **Via Electronic & U.S. Mail**

Mike Monasmith
Siting, Transmission and Environmental
Protection Division
California Energy Commission
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Allison Shaffer
Project Manager
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, California 92262

To Whom it May Concern:

Notice of Availability of the
Draft Environmental Impact Statement/Staff Assessment for the NextEra Energy Resources Genesis Solar Energy Project and Possible California Desert Conservation Area Plan Amendment; CEC Docket No. 09-AFC-8, BLM Docket No. CACA 4880

The Metropolitan Water District of Southern California (Metropolitan) reviewed the Draft Environmental Impact Statement/Staff Assessment (collectively, "DEIS") for the NextEra Energy Resources Genesis Solar Energy Project and Possible California Desert Conservation Area Plan Amendment (Project). The U.S. Bureau of Land Management (BLM) is the lead agency under the National Environmental Policy Act (NEPA) for the DEIS and the California Energy Commission (CEC) is the lead agency (for licensing thermal power plants 50 megawatts and larger) under the California Environmental Quality Act (CEQA) and has a certified regulatory program under CEQA. Under its certified program, CEC is exempt from having to prepare an environmental impact report. Its certified program, however, requires environmental analysis of the project or a "staff assessment," including an analysis of alternatives and mitigation measures to minimize any significant adverse effect the project may have on the environment.

Metropolitan is pleased to submit comments for consideration by BLM and CEC during the public comment period for the DEIS and staff assessment.[1] In sum, Metropolitan provides these comments to ensure that any potential impacts on its facilities in the vicinity of the Project and on the Colorado River water resources are adequately addressed.

[1] Comments on the DEIS and Revised Staff Assessment are due July 8, 2010 per the Federal Register notice. 75 Fed. Reg. 18204 (April 9, 2010). This comment deadline applies to the CEC's Revised Staff Assessment issued June 11, 2010 regardless of whether it is finalized separately from BLM's DEIS as the relevant comment periods may not be reduced or altered retroactively.

Background

Metropolitan is a public agency and regional water wholesaler. It is comprised of 26 member public agencies serving more than 19 million people in six counties in Southern California. One of Metropolitan's major water supplies is the Colorado River via Metropolitan's Colorado River Aqueduct (CRA). Metropolitan holds an entitlement to water from the Colorado River. The CRA consists of tunnels, open canals and buried pipelines. CRA-related facilities also include above and below ground reservoirs and aquifers, access and patrol roads, communication facilities, and residential housing sites. The CRA, which can deliver up to 1.2 million acre-feet of water annually, extends 242 miles from the Colorado River, through the Mojave Desert and into Lake Mathews. Metropolitan has five pumping plants located along the CRA, which consume approximately 2,400 gigawatt-hours of energy when the CRA is operating at full capacity.

Concurrent with its construction of the CRA in the mid-1930s, Metropolitan constructed 305 miles of 230 kV transmission lines that run from the Mead Substation in Southern Nevada, head south, then branch east to Parker, California, and then west along Metropolitan's CRA. Metropolitan's CRA transmission line easements lie on federally-owned land, managed by BLM. The transmission lines were built for the sole and exclusive purpose of supplying power from the Hoover and Parker projects to the five pumping plants along the CRA.

Metropolitan's ownership and operation of the CRA and its 230 kV transmission system is vital to its mission to provide Metropolitan's 5,200 square mile service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

Project Understanding

Genesis Solar LLC, a Delaware limited liability company and wholly owned subsidiary of NextEra™ Energy Resources LLC, proposes to construct, own, and operate the Genesis Solar Energy Project. The Project would be a concentrated solar electric generating facility that would be located in Riverside County, California.

The Project would consist of two independent solar electric generating facilities with a nominal net electrical output of 125 megawatts (MW) each, for a total net electrical output of 250 MW. Electrical power would be produced using steam turbine generators fed from solar steam generators. The solar steam generators receive heated transfer fluid from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun.

The Project proposes use of a wet cooling tower for power plant cooling. Water for cooling tower makeup, process water makeup, and other industrial uses such as mirror washing would be supplied from on-site groundwater wells. Project cooling water blow down would be piped to lined, on-site evaporation ponds.

The Project water needs will be met by use of groundwater pumped from one of two wells on the plant site. Water for domestic uses by project employees will also be provided by onsite

groundwater treated to potable water standards. During construction, the Project proponent anticipates using up to 2,440 acre-feet of water over the course of approximately three years. Following construction and for long-term operations, the average total annual water usage for all four units combined is estimated to be about 1,644 acre-feet per year (afy).

The project is located approximately 25 miles west of the city of Blythe, California, on lands managed by BLM. The project is an undeveloped area of the Sonoran Desert. Surrounding features include the McCoy Mountains to the east, the Palen Mountains (including the Palen/McCoy Wilderness Area) to the north, and Ford Dry Lake, a dry lakebed, to the south. I-10 is located to the south of the Project.

Land Use Issues: Potential Impacts on Metropolitan Facilities

Although Metropolitan has not yet identified any direct land use impacts, the Project is in the general vicinity of Metropolitan facilities, perhaps as close as 4 miles. As described above, Metropolitan currently has a significant number of facilities, real estate interests, and fee-owned rights-of-way, easements, and other properties (Facilities) located on or near BLM-managed land in southern California that are part of our water distribution system. Metropolitan is concerned with potential direct or indirect impacts that may result from the construction and operation of any proposed solar energy project on or near our Facilities. In order to avoid potential impacts, Metropolitan requests that the final EIS and staff assessment include an assessment of potential impacts to Metropolitan's Facilities with proposed measures to avoid or mitigate significant adverse effects.

Metropolitan is also concerned that locating solar projects near or across its electrical transmission system could have an adverse impact on Metropolitan's electric transmission-related operations and Facilities. From a reliability and safety aspect, Metropolitan is concerned with development of any proposed projects and supporting transmission systems that would cross or come in close proximity with Metropolitan's transmission system. Metropolitan requests that the final EIS and staff assessment analyze and assess any potential impacts to Metropolitan's transmission system.

Water Resources: Potential Impacts on Colorado River and Local Water Supplies

Metropolitan is also concerned about the Project's potential direct and cumulative impacts on water resources, specifically potential impacts on Colorado River and local groundwater supplies. As noted above, Metropolitan holds an entitlement to imported water supplies from the Colorado River. Water from the Colorado River is allocated pursuant to federal law and is managed by the Department of the Interior, Bureau of Reclamation (USBR). In order to lawfully use Colorado River water, a party must have an entitlement to do so. *See* Boulder Canyon Project Act of 1928, 43 U.S.C. §§ 617, et seq.; *Arizona v. California*, 547 U.S. 150 (2006).

As noted above, the Project proposes to use approximately 2,440 af of water during construction and 1,644 afy for long-term operations, using groundwater from a groundwater basin that is hydrogeologically connected to the Colorado River, within an area referred to as the "accounting surface." The extent of accounting surface area for the Colorado River was determined by the

U.S. Geological Survey (USGS) and USBR as part of an on-going rule-making process. *See* Notice of Proposed Rule Regulating the Use of the Lower Colorado River Without an Entitlement, 73 Fed. Reg. 40916 (July 16, 2008); USGS Scientific Investigation Report No. 2008-5113. To the extent the Project uses Colorado River water, it must have a documented right to do so.

Entities in California are using California's full entitlement of Colorado River water, meaning that all water is already contracted and no new water entitlements are available in California. In addition, the California contractors have agreed in the 1931 Seven Party Agreement to prioritize the delivery of California's Colorado River water among themselves. Under this priority agreement, the following mitigation alternatives identified in SOIL&WATER-15 are no longer available to Proponents to mitigate impacts to Colorado River water resources: "payment for irrigation improvements in Palo Verde Irrigation District, purchase of water rights within the Colorado River Basin that will be held in reserve, and/or BLM's Tamarisk Removal Program." Instead, Proponents would have to obtain Colorado River water for the Project from the existing junior priority holder, Metropolitan, which has the authority to sell water for power plant use. Mitigation measure SOIL&WATER-15 should be revised accordingly. Metropolitan is willing to discuss the exchange of a portion of its water entitlement subject to any required approvals by Metropolitan's Board of Directors and so long as the Proponents agree to provide a replacement supply through an agreement with Metropolitan. Proponents must fully address the impacts on Colorado River water resources and provide full mitigation for such impacts, including replacement of supply.

Additionally, CEC and BLM should assess the potential cumulative impacts of the use of the scarce Colorado River and local groundwater supplies in light of other pending renewable energy projects within the Colorado River Basin and the local groundwater regions. Metropolitan requests that the final EIS and staff assessment address the Proponent's water supply and any potential direct or cumulative impacts from this use.

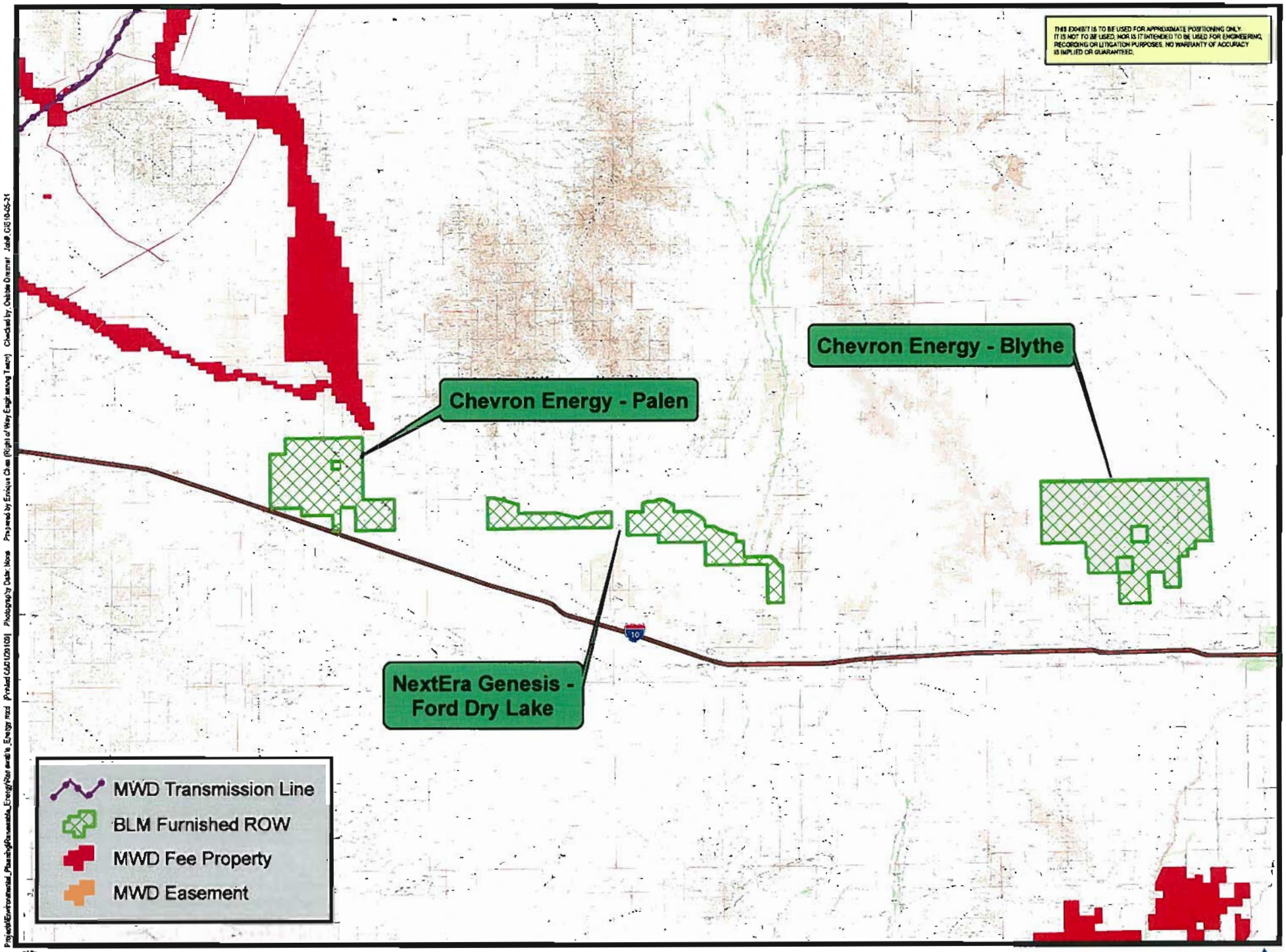
We appreciate the opportunity to provide input to your planning process and we look forward to receiving future environmental and related documentation on this project. If we can be of further assistance, please contact Dr. Debbie Drezner at (213) 217-5687.

Very truly yours,

Delaine W. Shane

Delaine W. Shane
Manager, Environmental Planning Team

DSD/dsd
(Public Folders/EPT/Letters/EPT Final Letters PDF/2010/15-JUN-10A.doc)
Enclosures: Map



The Metropolitan Water District of Southern California
Corporate Resources Group

Renewable Energy Projects
MWD Right of Way

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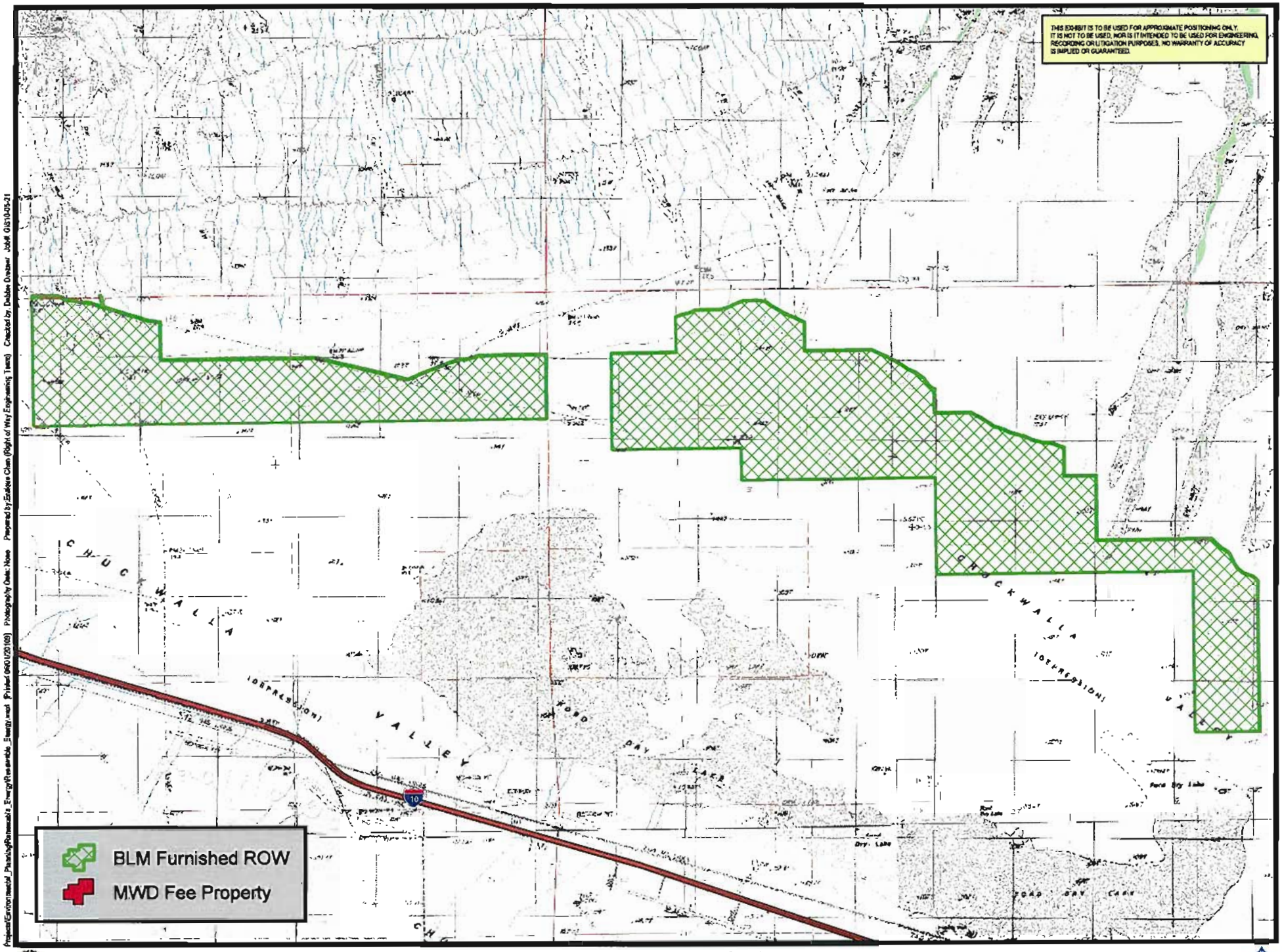

The Metropolitan Water District of Southern California
Corporate Resources Group

Renewable Energy Projects

NextEra - Genesis

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Projects\Environmental_Planning\Renewable_Energy\nextera_Energy.mxd (Printed 06/01/2010) Photography Date: None Prepared by: Eudoxia Chen (Right of Way Engineering Team) Checked by: Debbie Dunzer JobR GIS10-03-21

Terry Cook
<terry@kaiserventures.com>
06/28/2010 09:14 AM

To "CAPSSolarNexteraFPL@blm.gov"
<CAPSSolarNexteraFPL@blm.gov>
cc
bcc
Subject FW: Comment on the Draft EIS for the Nextra Energy Resources Genesis Solar Power Plant, Riverside County, Ca

Resending.

From: Terry Cook
Sent: Monday, June 28, 2010 9:11 AM
To: 'MMonasmi@energy.state.ca.us'; 'CAPSSolarNexteraFPL@blm.gov'
Subject: Comment on the Draft EIS for the Nextra Energy Resources Genesis Solar Power Plant, Riverside County, Ca

Ladies and Gentlemen: This e-mail is on behalf of Kaiser Eagle Mountain, LLC and Mine Reclamation, LLC (collectively "Kaiser). Kaiser is the owner and developer of the Eagle Mountain rail-haul landfill project located near Desert Center in Riverside County, California (the "Landfill Project"). The purpose of this e-mail is to comment on the joint Environmental Impact Statement/Staff Assessment ("EIS") for the Nextra Energy Resources Genesis Solar Power Plant in Riverside County (the "Genesis Project").

Kaiser's current comment on the EIS is limited to the discussion on groundwater contained in the EIS. Specifically, in discussing ground water the EIS for the Genesis Project incorrectly concludes that the Landfill Project will not be in existence. Based upon the incorrect premise that there will not be a Landfill Project, the EIS excludes from the groundwater discussion and analysis the use of water for the Landfill Project and the repopulation of the Eagle Mountain townsite. This is an error in the Genesis Project EIS that requires correction. Kaiser has further appealed the adverse November 2009 federal decision that impacts the Landfill Project. Additionally, regardless of the outcome of any further appeal, Kaiser, along with the BLM, may "fix" the three items the 9th Circuit Court of Appeals found to be deficient. Accordingly, the discussion and the resulting analysis in the Genesis Project EIS must be corrected to include the Landfill Project and its planned groundwater usage.

If you have any further questions or any clarification is necessary, please do not hesitate to contact me.

Terry L. Cook, Esq.
Executive Vice President & General Counsel
Kaiser Ventures LLC
3633 Inland Empire Blvd., Suite 480
Ontario, CA 91764
909.483.8511 (direct)
909.944.6605 (fax)

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June 23, 2010

Allison Shaffer
Project Manager
Palm Springs South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262

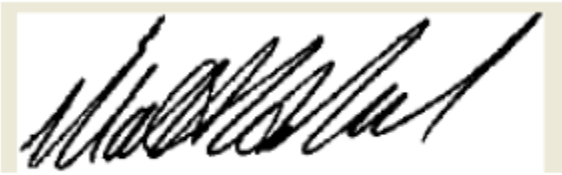
Subject: Comments on Draft EIS/SA for the Solar Millennium Blythe Solar Power Plant (the "Solar Millennium Project")

Dear Ms. Shaffer:

In order to minimize the environmental impacts associated with solar project development, NextEra Energy Resources, LLC ("NextEra") and SolarReserve, LLC ("SolarReserve") request that the Bureau of Land Management ("BLM") and the California Energy Commission ("CEC"), give consideration to establishing a North-South utility corridor through the Solar Millennium Project site (the "Utility Corridor") to accommodate an additional double circuit 230kV line which would run in parallel to the Solar Millennium's planned double circuit 230kV gen-tie to the SCE Colorado River Substation (reference attached conceptual drawings, Exhibits 1 & 2).

This Utility Corridor and additional double circuit 230kV line would allow projects to the north of the Solar Millennium Project to access Colorado River Substation with less environmental and land use impacts than alternatives which would involve creating additional, separate transmission line corridors around Solar Millennium's Project either to the west or to the east. NextEra would also provide a similar transmission right-of-way access along the eastern boundary of McCoy as shown in Exhibit 1, attached. By establishing the Utility Corridor, linear facilities from projects to the north would be combined and minimized, consistent with BLM and CEC best practices guidance for desert renewable energy projects.

Sincerely,



Matt Handel
Vice President Solar Development
NextEra Energy Resources

Tom Georgis
Vice President Development
SolarReserve

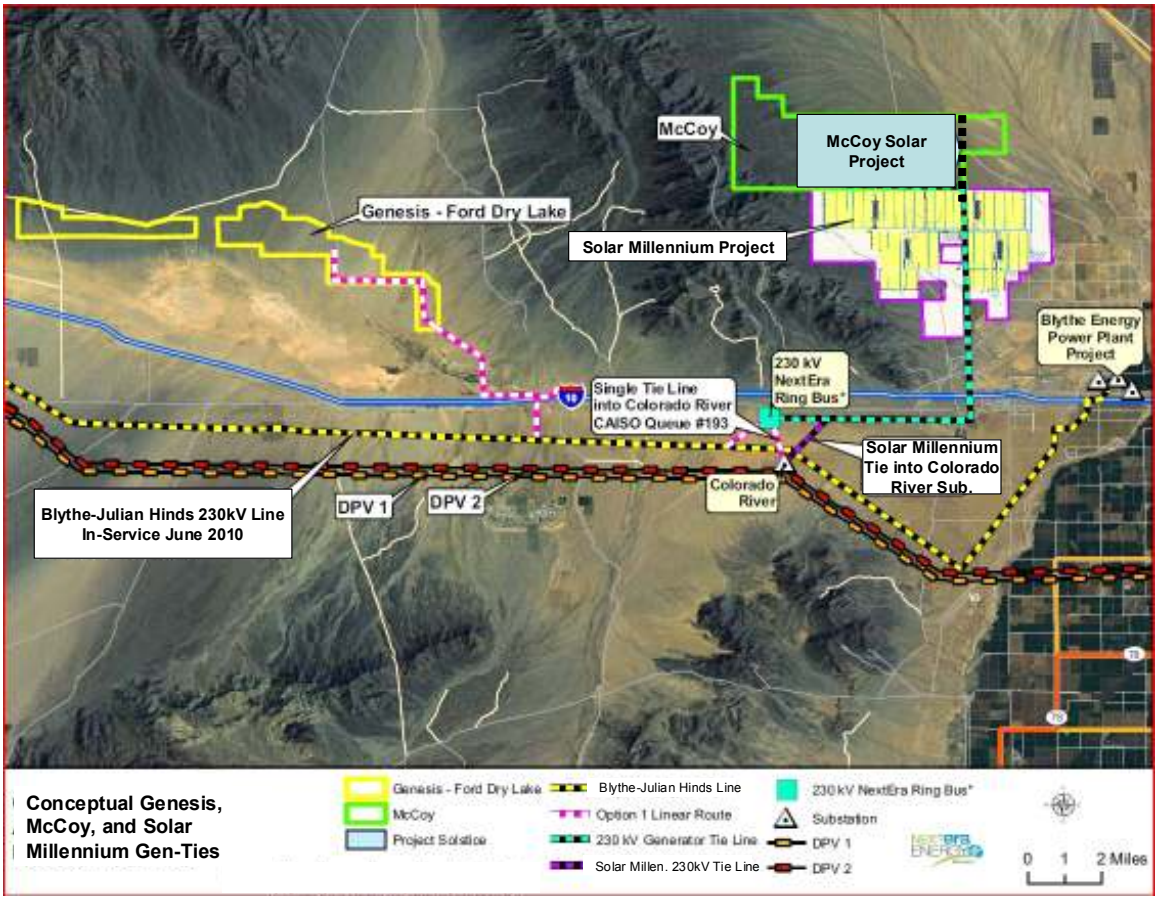


Exhibit 1: Conceptual Gen-tie Diagram

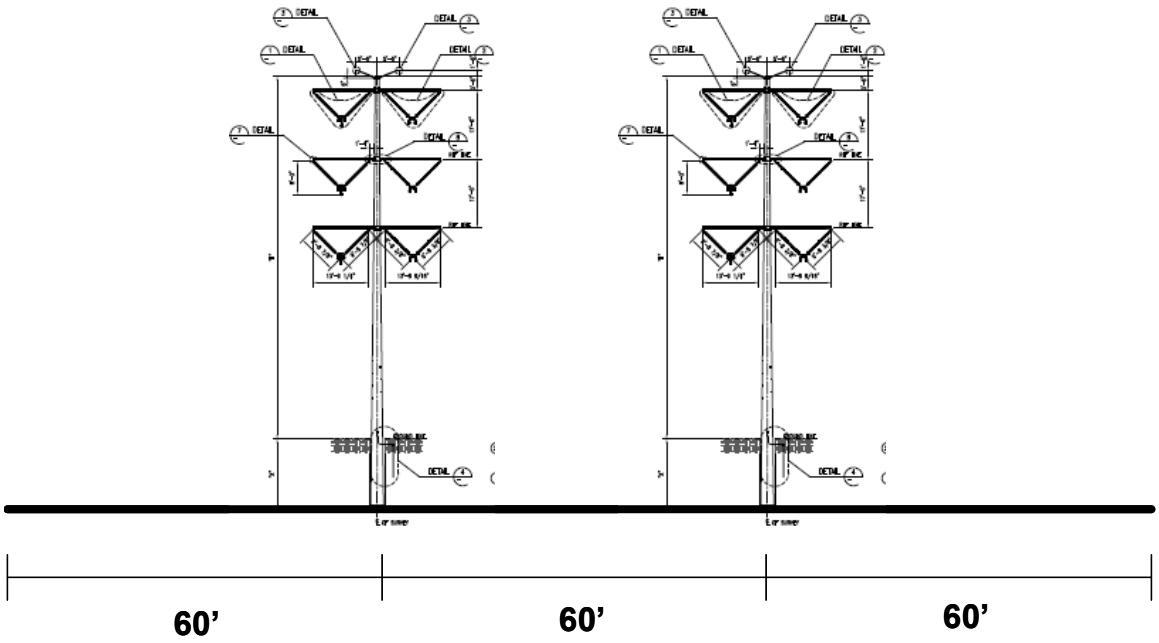


Exhibit 2: Conceptual Transmission ROW Configuration

"Ileene Anderson" <ianderson@biologicaldiversity.org>
07/08/2010 10:02 PM

To <CAPSSolarNextEraFPL@blm.gov>, "'Allison Shaffer'" <Allison_Shaffer@blm.gov>
cc "'Lisa Belenky'" <lbelenky@biologicaldiversity.org>, "'Mike Monasmith'" <Mmonasmi@energy.state.ca.us>, "'Docket Optical System'" <Docket@energy.state.ca.us>,
bcc
Subject CBD comments on Genesis Solar DEIS

Hello Allison Shaffer,
Please find attached to this email, the Center for Biological Diversity's comments on the Genesis Solar Project's DEIS along with 2 attachments. I will be sending you a hardcopy of our comments along with the attachments, as well as a CD with our comment references and the exhibits associated with Attachments 1 &2 via overnight mail.
If you have any questions, please feel free to contact me!
Thanks and best regards,
Ileene Anderson

ILeene Anderson
Biologist/Public Lands Desert Director
Center for Biological Diversity
PMB 447
8033 Sunset Boulevard
Los Angeles, CA 90046
(323) 654-5943
www.biologicaldiversity.org
"Our good fortune will only last as long as our natural resources" Will Rogers
Please consider the impact on the environment before printing this e-mail.
Get the latest on the BP oil spill on the Center's new Gulf Disaster website, updated daily.

CBD comments Genesis DEIS Final 7-8-10.pdf
Attachment 1 - Tom Myers final testimony, declaration, resume.pdf
Attachment 2 - Bill Powers final testimony, declaration, resume.pdf

CENTER *for* BIOLOGICAL DIVERSITY

VIA EMAIL AND FEDERAL EXPRESS OVERNIGHT DELIVERY

July 8, 2010

Allison Shaffer, Project Manager,
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, California 92262
CAPSSolarNextEraFPL@blm.gov

Re: Comments on the Draft Environmental Impact Statement/Staff Assessment for the Genesis Solar Energy Project and Possible California Desert Conservation Area Plan Amendment (CEC Application For Certification (09-AFC-8))

Dear Project Manager Shaffer:

These comments are submitted on behalf of the Center for Biological Diversity's 255,000 staff, members and on-line activists in California and throughout the western states, regarding the Draft Environmental Impact Statement/Staff Assessment Genesis Solar Energy Project ("DEIS") and Possible California Desert Conservation Area Plan Amendment (CEC Application For Certification (09-AFC-8)) ("proposed project"), issued by the Bureau of Land Management ("BLM").

The development of renewable energy is a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, and to assist California in meeting emission reductions set by AB 32 and Executive Orders S-03-05 and S-21-09. The Center for Biological Diversity (the "Center") strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitats, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

As proposed, the project would permanently disturb approximately 1,800 acres of public lands in the Colorado desert that provide habitat for many species including the threatened desert tortoise and the imperiled Mojave fringe-toed lizard. The proposed project also includes a gen-tie

Arizona • California • Nevada • New Mexico • Alaska • Oregon • Montana • Illinois • Minnesota • Vermont • Washington, DC
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tel: (415) 436.9682 ext. 307 *fax:* (415) 436.9683 lbelenky@biologicaldiversity.org *www.BiologicalDiversity.org*

line, and an expansion of the previously permitted but yet un-built Colorado substation. The DEIS for the proposed plan amendment and right-of-way application: fails to provide adequate identification and analysis of all of the significant impacts of the proposed project on the desert tortoise, the Mojave fringe-toed lizard, rare plants including ground water dependent vegetation, microphyll woodlands and other biological resources; fails to adequately address the significant cumulative impacts of the project; and lacks consideration of a reasonable range of alternatives.

Of particular concern is the BLM's failure to include adequate information regarding the impacts to resources and the failure to fully examine the impact of the proposed plan amendment to the California Desert Conservation Act Plan ("CDCA Plan") along with other similar proposed plan amendments and as a result the current piecemeal process may lead to the approval of industrial sites sprawling across the California Desert generally, and the Ford Dry Lake area in particular, within habitat that should be protected to achieve the goals of the bioregional plan as a whole. The DEIS discusses several "no action" alternatives but fails to adequately consider alternative plan amendments that would protect the most sensitive lands in this area from future development. Alternative siting and alternative technologies (including distributed PV) should have been fully considered in the DEIS, because they could significantly reduce the impacts to many species, soils, and water resources in the Colorado desert. Although the area of the proposed project is currently part of the evaluation being undertaken by the BLM for the solar PEIS for solar energy zones, within the "Riverside East" proposed solar energy study area ("SESA"), unfortunately, there has been no environmental documentation yet provided for that process and there is as yet no way to discern if the proposed project siting will be compatible with that planning. In scoping comments on the PEIS, the Center raised concerns about the impacts that development would have to species and habitats and particularly to connectivity. As the Center has emphasized in our comments on the various large-scale industrial solar proposals in the California desert, planning should be done *before* site specific projects are approved in order to ensure that resources are adequately protected from sprawl development and project impacts are avoided, minimized and mitigated.

The Center has been informed that the project applicant has continued to work with the agencies on alternative site configurations that may avoid or minimize some of the impacts of the project, however, the DEIS does not provide that information. Any new site configuration alternative will need to be circulated for public review and comment in a Supplemental or Revised DEIS that should also include additional information on those resources that were inadequately identified and analyzed in the DEIS and additional consideration of off-site alternatives and other alternatives. The Center urges the BLM to revise the DEIS to adequately address these and other issues detailed below and re-circulate the DEIS or a supplemental DEIS for public comment.

Even if the proposed project were to move forward on this site, the Center opposes the proposal to use wet-cooling for this large-scale industrial solar power project. The use of vast amounts of scarce groundwater resources in the Colorado desert is completely inappropriate particularly where alternative dry-cooling technology is available. That dry cooling is clearly a feasible alternative is shown by the fact that other solar companies have relied on dry-cooling in similar proposals and even in far larger proposals.

In the sections that follow, the Center provides detailed comments on the ways in which the DEIS fails to adequately identify and analyze many of the impacts that could result from the proposed project, including but not limited to: impacts to biological resources, impacts to water resources, impacts to soils, direct and indirect impacts from the gen-tie line and substation, and cumulative impacts.

Because the project approval process includes a quasi-judicial process in the California Energy Commission, the Center hereby incorporates by reference all of the materials before the California Energy Commission regarding the approval of this project. BLM is a party to the CEC process, which is being conducted in concert with the BLM approval process, and BLM has access to all of the documents (most of which are also readily accessible on the internet), therefore, BLM should incorporate all of the documents and materials from that process into the administrative record for the BLM decision as well.

I. The BLM's Analysis of the Proposed Plan Amendment and Proposed Project Fail to Comply with FLPMA.

As part of FLPMA, Congress designated 25 million acres of southern California as the California Desert Conservation Area ("CDCA"). 43 U.S.C. § 1781(c). Congress declared in FLPMA that the CDCA is a rich and unique environment teeming with "historical, scenic, archaeological, environmental, biological, cultural, scientific, educational, recreational, and economic resources." 43 U.S.C. § 1781(a)(2). Congress found that this desert and its resources are "extremely fragile, easily scarred, and slowly healed." *Id.* For the CDCA and other public lands, Congress mandated that the BLM "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C § 1732(b).

The sum total of the plan amendment to the CDCA plan is one sentence: Permission granted to construct solar energy facility (proposed PSPP Project). DEIS at A-7. The DEIS then lists the criteria for consideration of the plan amendment and right of way application and BLM's responses to each issue. DEIS at A-7 to A-10. The Center appreciates BLM's effort in this regard (which were absent in other recent environmental documents prepared for large-scale solar projects), however, given the impact of the proposed project on other multiple uses of these public lands at the proposed site as well as other aspects of the bioregional planning, it is clear that BLM may also need to amend other parts of the plan as well and should have looked at additional and/or different amendments as part of the alternatives analysis.

Oddly, unlike other proposed projects in this area (notably the Palen and Blythe projects), BLM did not propose any potential plan amendments that would adopt right of way exclusion areas as part of a mitigation strategy in order to increase protection for the rare plants and animals. For example, by designation of the Palen-Ford Wildlife Habitat Management Area (WHMA) as exclusion areas for rights of way. As established under the NECO plan amendment, "Species would have positive benefits from designation of DWMAs and the Multispecies WHMA through prescriptions aimed at reducing surface disturbance and improving natural communities" (*See* NECO at 4-156). While the Center supports additional protections for species and habitats on public land, if the BLM considers adopting such mitigation in this

instance as well, BLM needs to accurately address the limits of those protections on the ground under the current regulatory and statutory framework that applies to these public lands.

A. The DEIS Fails to Adequately Address the Plan Amendment in the Context of the CDCA Plan.

Unfortunately, the DEIS fails to adequately consider the impacts of the proposed project and plan amendment and reasonable alternatives in the context of FLPMA and the CDCA Plan. FLPMA requires that in developing and revising land use plans, the BLM consider many factors and "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences . . . consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values." 43 U.S.C. § 1712(c). As stated clearly in the CDCA Plan:

> The goal of the Plan is to provide for the use of the public lands, and resources of the California Desert Conservation Area, including economic, educational, scientific, and recreational uses, in a manner which enhances wherever possible—and which does not diminish, on balance—the environmental, cultural, and aesthetic values of the Desert and its productivity.

CDCA Plan at 5-6. The CDCA Plan also provides several overarching management principles:

> MANAGEMENT PRINCIPLES
>
> The management principles contained in the law (FLPMA)—*multiple use, sustained yield, and the maintenance of environmental quality*—are not simple guides. Resolution of conflicts in the California Desert Plan requires innovative management approaches for everything from wilderness and wildlife to grazing and mineral development. These approaches include:
>
> —Seeking simplicity for management direction and public understanding, avoiding complication and confusing in detail which would make the Plan in comprehensive and unworkable.
>
> —Development of decision-making processes using appropriate guidelines and criteria which provide for public review and understanding. These processes are designed to help in allowing for the use of desert lands and resources while preventing their undue degradation or impairment.
>
> —*Responding to national priority needs for resource use and development, both today and in the future, including such paramount priorities as energy development and transmission, without compromising the basic desert resources of soil, air, water, and vegetation, or public values such as wildlife, cultural resources, or magnificent desert scenery. This means, in the face of unknowns, erring on the side of conservation in order not to risk today what we cannot replace tomorrow.*
>
> —*Recognizing that the natural patterns of the California Desert, its geological and biological systems, are the basis for planning*, and that human use

> patterns, from freeways to fence lines, define its boundaries. Only in this way can the public resources can be understood and protected by the Plan that can be publicly comprehended, accepted, and followed.

CDCA Plan 1980 at 6 (first emphasis in original, second emphasis added).

The CDCA Plan anticipated that there would be multiple plan amendments over the life of the plan and provides specific requirements for analysis of Plan amendments. Those requirements include determining "if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element" and evaluating "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection." CDCA Plan at 121. BLM reads this portion of the CDCA plan extremely narrowly and attempts to divorce it from the required NEPA analysis and alternatives. Looking at the CDCA Plan requirement in context with the NEPA review it is clear that the BLM was required to analyze not only whether alternative locations were available that would not require a plan amendment, but also how the proposed amendment would affect desert-wide resource protection and whether alternative locations and alternative plan amendments would avoid or lessen those impacts—BLM fails to address the latter issue and did not look at any site alternatives. The inclusion of multiple "no action" alternatives, a reduced acreage alternative, and a reconfigured alternative as part of the NEPA analysis failed to cure this omission.

The CDCA Plan includes the Energy Production and Utility Corridors Element which is focused primarily on utility corridors with brief discussion of powerplant siting. Even in 1980 the CDCA Plan contemplated that alternative energy projects would likely be developed in the future but did not expressly provide planning direction for solar energy production. Nonetheless, the overarching principles expressed in the Decision Criteria are also applicable to the proposed project here including minimizing the number of separate rights-of-way, providing alternatives for consideration during the processing of applications, and "avoid[ing] sensitive resources wherever possible." CDCA Plan at 93. Nothing in the DEIS shows that BLM considered the landscape level issues and management objectives or alternatives to the proposed plan amendment *in the DEIS*.

In addition, BLM should have considered the impacts to existing land use plans for these public lands across several scales including, for example: in the Chuckwalla valley, in the Colorado Desert in California; and in the CDCA as a whole.

B. The DEIS Fails to Adequately Address Impacts to Multiple Use Class M Lands and Loss of Multiple Use in Favor of a Single Use for Industrial Purposes.

As FLPMA declares, public lands are to be managed for multiple uses "in a manner that will protect the quality of the scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." 43 U.S.C.§ 1701(a)(7) & (8). The CDCA Plan as amended provides for four distinct multiple use classes based on the sensitivity of resources in each area. The proposed project site is in MUC class M lands. DEIS at C.12-38.

Under the CDCA Plan, Multiple-use Class M (Moderate Use) "protects sensitive, natural, scenic, ecological, and cultural resources values. For public lands designated as Class M the CDCA Plan intends a "*controlled balance* between higher intensity use and protection of public lands. This class provides for a wide variety o[f] present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Class M management is *also* designed to conserve desert resources and to mitigate damage to those resources which permitted uses may cause." CDCA Plan at 13 (emphasis added). The proposed project is a high-intensity, single use of resources that will displace all other uses and that will significantly diminish (indeed, completely destroy) of approximately 1,800 acres of habitat including impacting aeolian transport in the dunes ecosystem, directly impacting habitat for desert tortoise, and other impacts to species and habitats. The DEIS does consider alternative configurations that would avoid some impacts to some resources but still fails to consider how the impacts to sand dunes and Aeolian transport along with the loss of a large area of habitat will affect the biological resources of this area. Moreover, BLM does not address how the loss of multiple uses in such a large area might affect other nearby public lands in the CDCA such as creating greater pressures on those land for the remaining multiple uses.

The DEIS does not consider whether and how the new primary access road (or any secondary access road) created for the proposed project may increase off-road vehicle use in this area and thereby significantly increase impacts from ORVs on species and habitats surrounding the proposed project and specifically whether this expanded access would increase unlawful vehicle use in the adjacent wilderness. As another example, the DEIS is unclear as to the extent that the proposal would require changes in the route network resulting a number of routes which would need to be moved—those changes to the route network are simply not addressed in the DEIS (nor are the likely direct, indirect and cumulative impacts of changing those route designations adequately identified or analyzed, as discussed in detail below). Any changes to routes would require BLM to amend the route designations in the area because these routes are part of a network that was adopted through a plan amendment. When BLM does consider these issues, as it must, in a revised or supplemental DEIS, a range of alternatives must be considered in addition to the fact that such changes may increase use of this area by ORVs and change use of the previously existing nearby routes, most likely causing increased use on other nearby routes. BLM should consider limiting access to the primary access route (and any secondary route) in order to help ensure against unauthorized off-road vehicle use in the area. Even if BLM attempts to simply reroute along the fenceline for the proposed project a plan amendment would be required and BLM must then consider that new unauthorized routes to provide connections to the other routes, and/or entirely new unauthorized routes may be created by off-road vehicle users *to avoid the industrial site entirely*. There is no evidence that recreational off-road vehicle users will be content to drive for miles along a fence adjoining an industrial site rather than striking off cross-country to connect with more scenic routes. Past experience shows that the latter is quite understandably a much more likely outcome and BLM should recognize this in analyzing the impacts of this project on the existing route network and any proposal to amend that network. Currently there are very few routes in the general vicinity of the proposed project. The proposed project would actually increase the accessibility of this currently remote area which could put additional pressure on the remaining natural resources.

C. Fails to Adequately Address Other Ongoing Planning Efforts

As noted above, the DEIS fails to adequately address the proposed project in the context of other connected projects (including multiple renewable energy projects, substations and additional transmission lines) and the ongoing PEIS planning process for solar development in six western states undertaken by BLM and DOE. The scoping and early maps for the PEIS did identify this area as a proposed solar energy study area.[1] Unfortunately, that planning process has been slow to move forward. Without prior planning, there is a high risk that the direct, indirect and cumulative impacts of the proposed project in conjunction with others may lead to sprawl development in the area and undermine the planning for renewable energy industrial zones that BLM has undertaken.

Of particular concern is the failure of the DEIS to fully analyze the impacts of the gen-tie line and the Colorado River substation which is listed as a cumulative project but no location is provided and the BLM has failed to explore alternatives that would minimize impacts of the placement of that substation. *See, e.g.,* DEIS at C12.14 (length of the gen-tie unclear). The Devers to Palo Verde No. 2 environmental review preferred alternative (as revised for the California-only line adopted by the CPUC) did not analyze a *substation* in this area. The BLM cannot lawfully piecemeal this project approval. Although the applicant has recently submitted additional information on regarding the substation impacts to the CEC, *that information is not included in the DEIS* and therefore the DEIS must be revised or supplemented. Moreover, the BLM has failed to explain how this site specific approval would interface with, or alternatively undermine, the solar programmatic planning by federal agencies for the western states. This critical issue regarding planning on public lands is not adequately addressed in the DEIS which only mentions the PEIS process briefly, and then includes the PEIS as a foreseeable future project with no explanation (DEIS at B.4-16). The BLM does not analyze how the PEIS could be affected by the approval of this and other projects in the area and does not address how the piecemeal analysis of the substation and gen-tie line may undermine the planning for a solar zone in this area. Such analysis *after the fact* is not consistent with the planning requirements of FLPMA or, indeed, any rational land use planning principles.

D. BLM Failed to Inventory the Resources of these Public Lands Before Making a Decision to Allow Destruction of those Resources

FLPMA states that "[t]he Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values," and this "[t]his inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. § 1711(a). FLPMA also requires that this inventory form the basis of the land use planning process. 43 U.S.C. § 1701(a)(2). *See Center for Biological Diversity v. Bureau of Land Management*, 422 F.Supp.2d 1115, 1166-67 (N.D. Cal. 2006) (discussing need for BLM to take into account known resources in making management decisions); *ONDA v. Rasmussen,* 451 F.Supp. 2d 1202, 1212-13 (D. Or. 2006) (finding that BLM did not take a hard look under NEPA by relying on outdated inventories and such reliance was inconsistent with BLM's statutory obligations to engage in a continuing inventory under FLPMA). It is clear that

[1] http://solareis.anl.gov/documents/maps/studyareas/Solar_Study_Area_CA_Ltt_7-09.pdf

BLM should not approve a management plan amendment based on outdated and inadequate inventories of affected resources on public lands.

As detailed below in the NEPA sections, here BLM has failed to compile an adequate inventory of the resources of the public lands that could be affected by the proposed project *before* preparing the DEIS (including, e.g., rare plants, golden eagle surveys, and other biological resources) which is necessary in order to adequately assess the impacts to resources of these public lands in light of the proposed plan amendment and BLM has also failed to adequately analyze impacts on known resources. Indeed, the DEIS states that surveys are ongoing after the DEIS was issued where protocol level surveys for desert tortoise will be conducted as well as surveys for rare plants and Couch's spadefoot toad See DEIS at C.2-6. Similarly for golden eagles, the DEIS says "the USFWS recommends that the Applicant conduct nest surveys for this species in Spring 2010 (Engelhard pers. comm.)" *See* DEIS at C.2-81. Although the Center understands that golden eagle surveys have now been completed, because that information was not included in the DEIS and no analysis of impacts is provided, the BLM must revise and recirculate the DEIS or a supplement to include that new information.

Therefore, it appears that a revised DEIS or supplemental DEIS must be prepared to include several categories of new information including new survey data about the resources of the site and potential impacts of the project on resources of our public land and water, and that document must be circulated for public review and comment.

E. The DEIS Fails to Provide Adequate Information to Ensure that the BLM will Prevent Unnecessary and Undue Degradation of Public lands

FLPMA requires BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" and "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §§ 1732(b), 1732(d)(2)(a). Without adequate information and analysis of the current status of the resources of these public lands, BLM cannot fulfill its duty to prevent unnecessary or undue degradation of the public lands and resources. Thus, the failure to provide an adequate current inventory of resources and environmental review undermines BLM's ability to protect and manage these lands in accordance with the statutory directive.

BLM has failed to properly identify and analyze impacts to the resources including the impacts from all of the project components. As detailed below, the BLM's failure in this regard violates the most basic requirements of NEPA and in addition undermines the BLM's ability to ensure that the proposal does not cause unnecessary and undue degradation of public lands. *See Island Mountain Protectors*, 144 IBLA 168, 202 (1998) (holding that "[t]o the extent BLM failed to meet its obligations under NEPA, it also failed to protect public lands from unnecessary or undue degradation."); *National Wildlife Federation*, 140 IBLA 85, 101 (1997) (holding that "BLM violated FLPMA, because it failed to engage in any reasoned or informed decisionmaking process" or show that it had "balanced competing resource values").

II. The DEIS Fails to Comply with NEPA.

NEPA is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1(a). In NEPA, Congress declared a national policy of "creat[ing] and maintain[ing] conditions under which man and nature can exist in productive harmony." *Or. Natural Desert Ass'n v. Bureau of Land Mgmt.,* 531 F.3d 1114, 1120 (9th Cir. 2008) (quoting 42 U.S.C. § 4331(a)). NEPA is intended to "ensure that [federal agencies] … will have detailed information concerning significant environmental impacts" and "guarantee[] that the relevant information will be made available to the larger [public] audience." *Blue Mountains Biodiversity Project v. Blackwood,* 161 F.3d 1208, 1212 (9th Cir. 1998).

Under NEPA, before a federal agency takes a "'major [f]ederal action[] significantly affecting the quality' of the environment," the agency must prepare an environmental impact statement (EIS). *Kern v. U.S. Bureau of Land Mgmt.,* 284 F.3d 1062, 1067 (9th Cir. 2002) (quoting 43 U.S.C. § 4332(2)(C)). "An EIS is a thorough analysis of the potential environmental impact that 'provide[s] full and fair discussion of significant environmental impacts and … inform[s] decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.'" *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.,* 387 F.3d 989, 993 (9th Cir. 2004) (citing 40 C.F.R. § 1502.1). An EIS is NEPA's "chief tool" and is "designed as an 'action-forcing device to [e]nsure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government.'" *Or. Natural Desert Ass'n,* 531 F.3d at 1121 (quoting 40 C.F.R. § 1502.1).

An EIS must identify and analyze the direct, indirect, and cumulative effects of the proposed action. This requires more than "general statements about possible effects and some risk" or simply conclusory statements regarding the impacts of a project. *Klamath Siskiyou Wildlands Center v. BLM,* 387 F.3d 989, 995 (9th Cir. 2004) (citation omitted); *Oregon Natural Resources Council v. BLM,* 470 F.3d 818, 822-23 (9th Cir. 2006). Conclusory statements alone "do not equip a decisionmaker to make an informed decision about alternative courses of action or a court to review the Secretary's reasoning." *NRDC v. Hodel*, 865 F.2d 288, 298 (D.C. Cir. 1988).

NEPA also requires BLM to ensure the scientific integrity and accuracy of the information used in its decision-making. 40 CFR § 1502.24. The regulations specify that the agency "must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential." 40 C.F.R. § 1500.1(b). Where there is incomplete information that is relevant to the reasonably foreseeable impacts of a project and essential for a reasoned choice among alternatives, the BLM must obtain that information unless the costs of doing so would be exorbitant or the means of obtaining the information are unknown. 40 C.F.R. § 1502.22. Here the costs are reasonable to obtain information needed to complete the analysis and the BLM must provide additional information in the EIS—through a supplement or revised EIS. Even in those instances where complete data is unavailable, the EIS also must contain an analysis of the worst-case scenario resulting from the proposed project. *Friends of Endangered Species v. Jantzen*, 760 F.3d 976, 988 (9th Cir. 1985) (NEPA requires a worst case analysis when information relevant to impacts is essential and not known and the costs of obtaining the information are exorbitant or the means

of obtaining it are not known) *citing Save our Ecosystems v. Clark*, 747 F.2d 1240, 1243 (9th Cir. 1984); 40 C.F.R. § 1502.22.

A. Purpose And Need and Project Description are Too Narrowly Construed and Unlawfully Segment the Analysis

1. Purpose and Need:

Agencies cannot narrow the purpose and need statement to fit only the proposed project and then shape their findings to approve that project without a "hard look" at the environmental consequences. To do so would allow an agency to circumvent environmental laws by simply "going-through-the-motions." It is well established that NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; *Metcalf v. Daley*, 214 F.3d 1135, 1141-42 (9th Cir. 2000) ("the comprehensive 'hard look' mandated by Congress and required by the statute must be timely, and it must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.") As Ninth Circuit noted an "agency cannot define its objectives in unreasonably narrow terms." *City of Carmel-by-the-Sea v. U.S. Dept. of Transportation*, 123 F.3d 1142, 1155 (9th Cir. 1997); *Muckleshot Indian Tribe v. U.S. Forest Service*, 177 F. 3d 900, 812 (9th Cir. 1999). The statement of purpose and alternatives are closely linked since "the stated goal of a project necessarily dictates the range of 'reasonable' alternatives." *City of Carmel*, 123 F.3d at 1155. The Ninth Circuit recently reaffirmed this point in *National Parks Conservation Assn v. BLM*, 586 F.3d 735, 746-48 (9th Cir. 2009) (holding that "[a]s a result of [an] unreasonably narrow purpose and need statement, the BLM necessarily considered an unreasonably narrow range of alternatives" in violation of NEPA).

The purpose behind the requirement that the purpose and need statement not be unreasonably narrow, and NEPA in general is, in large part, to "guarantee[ ] that the relevant information will be made available to the larger audience that may also play a role in both the decision-making process and the implementation of that decision." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The agency cannot camouflage its analysis or avoid robust public input, because "the very purpose of a draft and the ensuing comment period is to elicit suggestions and criticisms to enhance the proposed project." *City of Carmel-by-the-Sea*, 123 F.3d at 1156. The agency cannot circumvent relevant public input by narrowing the purpose and need so that no alternatives can be meaningfully explored or by failing to review a reasonable range of alternatives.

The BLM's purpose and need for the proposed Genesis project is "respond to Genesis Solar, LLC's application under Title V of Federal Land Policy and Management Act, FLPMA (43 U.S.C. 1761) for a ROW grant to construct, operate, and decommission a solar thermal facility on public lands in compliance with FLPMA, BLM ROW regulations, and other Federal applicable laws." (DEIS at 6; *see also* DEIS at B.2-10 (same with NextEra)), and also states that the "BLM authorities include:

• Executive order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the

> "production and transmission of energy in a safe and environmentally sound manner."
>
> • The Energy Policy Act 2005, which requires the Department of the Interior (BLM's parent agency) to approve at least 10,000 MW of renewable energy on public lands by 2015.
>
> • Secretarial Order 3285, dated March 11, 2009, which "establishes the development of renewable energy as a priority for the Department of the Interior."

DEIS at 7. The DEIS notes that an amendment to the CDCA Plan is needed in order to approve the project but does not clearly identify the plan amendment as a part of the project being evaluated. Rather, the DEIS states: "If the BLM decides to approve the issuance of a ROW grant, the BLM will also amend the CDCA Plan as required." DEIS at 7. BLM's purpose and need is very narrowly construed to the proposed project itself and an amendment to the Plan *for the project only*. The purpose and need provided in the DEIS is impermissibly narrow under NEPA for several reasons, most importantly because it foreclosed meaningful alternatives review in the DEIS. Because the purpose and need and the alternatives analysis are at the "heart" of NEPA review and affect nearly all other aspects of the EIS, on this basis and others, BLM must revise and re-circulate the DEIS.

The DOE purpose and need statement provides:

> The Applicant has applied to the Department of Energy (DOE) for a loan guarantee under Title XVII of the Energy Policy Act of 2005 (EPAct 05), as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, P.L. 111-5 (the "Recovery Act"). DOE is a cooperating agency on this EIS pursuant to an MOU between DOE and BLM signed in January 2010. The purpose and need for action by DOE is to comply with its mandate under EPAct by selecting eligible projects that meet the goals of the Act.

DEIS at 7.

In discussing the cumulative scenario, the DOE loan guarantee program is also described as one of the incentive programs for funding renewable energy projects:

> Example[s] of incentives for developers to propose renewable energy projects on private and public lands in California, Nevada and Arizona, include the following:
>
> ● U.S. Treasury Department's Payments for Specified Energy Property in Lieu of Tax Credits under §1603 of the American Recovery and Reinvestment Act of 2009 (Public Law 1115) - Offers a grant (in lieu of investment tax credit) to receive funding for 30% of their total capital cost at such time as a project achieves commercial operation (currently applies to projects that begin construction by December 31, 2010 and begin commercial operation before January 1, 2017).

> ● U.S. Department of Energy (DOE) Loan Guarantee Program pursuant to §1703 of Title XVII of the Energy Policy Act of 2005 - Offers a loan guarantee that is also a low interest loan to finance up to 80% of the capital cost at an interest rate much lower than conventional financing. The lower interest rate can reduce the cost of financing and the gross project cost on the order of several hundred million dollars over the life of the project, depending on the capital cost of the project.

DEIS at B.3-2.

The Center is well aware that deadlines for funding, particularly for the American Recovery and Reinvestment Act ("ARRA") funds, have driven the pace of the environmental review for this project and others and, while such funding mechanisms are important, deadlines cannot be used as an excuse for rushed and inadequate NEPA review. The BLM and DOE must be concerned with the adequate NEPA review and even if the agencies can properly have an objective of *timely* approval of projects they cannot properly have as purpose and need of the project a *rushed* inadequate environmental impact review.

Moreover, in its discussion of the need for renewable energy production the DEIS fails to address risks associated with global climate change in context of including both the need for climate change mitigation strategies (e.g., reducing greenhouse gas emissions) and the need for climate change adaptation strategies (e.g., conserving intact wild lands and the corridors that connect them). All climate change adaptation strategies underline the importance of protecting intact wild lands and associated wildlife corridors as a priority adaptation strategy measure.

The habitat fragmentation, loss of connectivity for terrestrial wildlife, and introduction of predators and invasive weed species associated with the proposed project in the proposed location may run contrary to an effective climate change adaptation strategy. For example, this project includes a proposal for a new paved road cutting into previously undisturbed habitat and ending at the proposed project site which abuts a designated wilderness area. The proposed project will admittedly impact sand transport and habitat for the Mojave fringe-toed lizard and other species and proposes to use large amounts of pristine groundwater for wet-cooling which also threatens the long-term health of the local ecosystem as well as the groundwater resources of the Chuckwalla Valley and connected aquifers. Siting the proposed project in the proposed location impacting sand dune ecosystems, occupied habitat and important habitat linkage areas, major washes and other fragile desert resources could undermine a meaningful climate change adaptation strategy with a poorly executed climate change mitigation strategy. Moreover, the project itself will emit greenhouse gases and the DEIS contains no discussion of ways to avoid, minimize or off set these emissions although such mitigation is clearly feasible and other technologies have far less or no GHG emissions during operations are also likely to have fewer emissions when calculated on a lifecycle basis. The way to maintain healthy, vibrant ecosystems is not to fragment them and reduce their biodiversity.

2. Project Description

The project description remains incomplete in several ways. First, there is no clear description of the proposed expansion of the Colorado River substation or the impacts it would have. Second, is the outstanding issue of a second access road needed for public and worker safety. The DEIS discusses the need for a second access road but does not provide information about where it would be or the impacts it would have on the environment. The applicant recently suggested a "spur" road off the main proposed access road as the secondary access but it is not yet clear whether the local emergency management authorities in the County would accept this as providing sufficient safety for workers or the public. Moreover, those impacts were not discussed or analyze in the DEIS.

B. The DEIS Does Not Adequately Describe Environmental Baseline

BLM is required to "describe the environment of the areas to be affected or created by the alternatives under consideration." 40 CFR § 1502.15. The establishment of the baseline conditions of the affected environment is a practical requirement of the NEPA process. In *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." Similarly, without a clear understanding of the current status of these public lands BLM cannot make a rational decision regarding proposed project. *See Center for Biological Diversity v. U.S. Bureau of Land Management, et al*., 422 F. Supp. 2d 1115, 1166-68 (N.D. Cal. 2006) (holding that it was arbitrary and capricious for BLM to approve a project based on outdated and inaccurate information regarding biological resources found on public lands).

The DEIS fails to provide adequate baseline information and description of the environmental setting in many areas including in particular the status of rare plants, animals and communities.

The baseline descriptions in the DEIS are inadequate particularly for the areas where surveys are ongoing. As discussed below, because of the deficiencies of the baseline data for the proposed project area, the DEIS fails to adequately describe the environmental baseline. Many of the rare and common but essential species and habitats have incomplete and/or vague on-site descriptions that make determining the proposed project's impacts difficult at best. Some of the rare species/habitats baseline conditions are totally absent, therefore no impact assessment is provided either. A supplemental document is required to fully identify the baseline conditions of the site, and that baseline needs to be used to evaluate the impacts of the proposed project.

C. Failure to Identify and Analyze Direct and Indirect Impacts to Biological Resources

The EIS fails to adequately analyze the direct, indirect, and cumulative impacts of the proposed project on the environment. The Ninth Circuit has made clear that NEPA requires agencies to take a "hard look" at the effects of proposed actions; a cursory review of

environmental impacts will not stand. *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150-52, 1154 (9th Cir. 1998). Where the BLM has incomplete or insufficient information, NEPA requires the agency to do the necessary work to obtain it where possible. 40 C.F.R. §1502.22; *see National Parks & Conservation Ass'n v. Babbitt,* 241 F.3d 722, 733 (9th Cir. 2001) ("lack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it.")

Moreover, BLM must look at reasonable mitigation measures to avoid impacts in the DEIS but failed to do so here. Even in those cases where the extent of impacts may be somewhat uncertain due to the complexity of the issues, BLM is not relieved of its responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset. Even if the discussion may of necessity be tentative or contingent, NEPA requires that the BLM provide some information regarding whether significant impacts could be avoided. *South Fork Band Council of Western Shoshone v. DOI* , 588 F.3d 718 , 727 (9th Cir. 2009).

The lack of comprehensive surveys is particularly problematic. Failure to conduct sufficient surveys prior to construction of the project also effectively eliminates the most important function of surveys - using the information from the surveys to minimize harm caused by the project and reduce the need for mitigation. Often efforts to mitigate harm are far less effective than preventing the harm in the first place. In addition, without understanding the scope of harm before it occurs, it is difficult to quantify an appropriate amount and type of mitigation.

The DEIS also acknowledges that additional special status species surveys will be conducted in 2010 surveys (DEIS at C.2-6). The results of those surveys are not available in the DEIS. Therefore, it is impossible to evaluate the potential impact of the proposed project based on the lack of adequate survey data.

The DEIS recognizes that the project is within a Wildlife Habitat Management Areas (WHMAs) as established under NECO – the Palen-Ford WHMA which was "specifically established to protect the dunes and playas (NECO sensitive habitat types) and the Mojave fringe-toed lizard". (DEIS at C.2-133). In addition numerous other large-scale industrial solar projects are proposed in the Palen-Ford WHMA. No mitigation is proposed to mitigate the identified losses specifically to the Palen-Ford WHMA.

1. Desert Tortoise

The desert tortoise has lived in the western deserts for tens of thousands of years. In the 1970's their populations were noted to decline. Subsequently, the species was listed as threatened by the State of California in 1989 and by the U.S. Fish and Wildlife Service in 1990, which then issued a Recovery Plan for the tortoise in 1994. The U.S. Fish and Wildlife Service is in the process of updating the Recovery Plan, and a Draft Updated Recovery Plan was issued in 2008, however it has not been finalized. Current data indicate a continued decline across the range of the listed species[2] despite its protected status and recovery actions.

[2] USFWS 2009

The original and draft Updated Recovery Plans both recognize uniqueness in desert tortoise populations in California. This particular subpopulation of tortoise at the proposed project site are part of the Eastern Colorado Recovery unit[3]. Recent population genetics studies[4] have further confirmed 1994 Recovery Plan conclusions the Eastern Colorado Recovery unit was one of the most genetically unique recovery units. While the proposed project site may have low desert tortoise densities (the DEIS fails to identify the actual number of desert tortoise estimated to be onsite), this particular recovery unit has also been documented to have the second highest declines in population over the last two years – 37% decline [5]. The DEIS fails to identify and consider the localized impact to this recovery unit that is already in steep decline.

While Bio-10 requires a Desert Tortoise Relocation/Translocation Plan (DEIS at pg. C.2-174), no desert tortoise relocation/translocation plan was included in the DEIS. Recent desert tortoise translocations have resulted in significant short-term mortality up to 45%[6] and unknown long-term survivorship. It is imperative to have this important plan available in the revised DEIS in order for the public and decision makers to be able to evaluate the effectiveness of the proposed strategies.

Mechanisms need to be included to assure that any and all mitigation acquisitions will be conserved in perpetuity for the conservation of the desert tortoise. If those acquisitions are within existing Desert Wildlife Management Areas (DWMAs), higher levels of protection than are currently in place for DWMAs need to be put in place. NEPA mandates consideration of the relevant environmental factors and environmental review of "[b]oth *short- and long-term* effects" in order to determine the significance of the project's impacts. 40 C.F.R. § 1508.27(a) (emphasis added). BLM has clearly failed to do so in this instance with respect to the impact to the desert tortoise.

The 1:1 mitigation ratio of desert tortoise habitat outside of critical habitat is actually inadequate to mitigate for the destruction of habitat. Mitigation presumes that acquisition will be appropriate tortoise habitat (occupied or unoccupied) which is currently existing and providing benefits to the species, to off-set the elimination of the proposed project site. However, this strategy is still *a net loss of habitat* to the desert tortoise, as currently they are using or could use both the mitigation site and the proposed project site. Therefore, in order to aid in recovery of this declining species, at a minimum a 2:1 mitigation ratio should be required as mitigation for the total elimination of desert tortoise habitat on the proposed project site.

If tortoises are relocated or translocated, then the relocation and/or translocation areas need to be secured for tortoise conservation, to preclude moving the animals subsequently if additional projects move forward on the relocation or translocation site(s).

2. Desert Bighorn Sheep and Burro Deer

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[3] USFWS 1994
[4] Murphy et al. 2007
[5] USFWS 2009.
[6] Gowan and Berry 2010.

The DEIS completely dismisses any desert bighorn sheep and burro deer impacts from the proposed project because of the I-10 interstate. While we agree that the I-10 is currently a significant barrier to the movement of bighorn and burro deer (and other species), clearly the DEIS fails to evaluate the opportunity via the propose project to re-establish historic linkage for bighorn sheep and burro deer across the Chuckwalla Valley between the Palen-McCoy Mountains and the Chuckwalla Mountains (Bighorn WHMA). The DEIS simply proposes to add another significant block to bighorn and wildlife movement in the area, without considering ways to ameliorate or improve the existing conditions.

3. Mojave fringe-toed lizard/Sand dunes/Sand Transport System

The proposed project would directly impact 66 acres of Mojave fringe-toed lizard habitat and would interfere with part of a regional sand transport corridor, affecting approximately 453 acres of downwind sand dunes (DEIS at pg. C.2-62). The DEIS inappropriately considers the downwind impact to be indirect impacts, when actually they are direct impacts to habitat. While occupied habitat of stabilized and partially stabilized dunes and playa and sand drifts over playa are proposed to be mitigated at 3:1, the "indirect impacts to MFTL habitat" are only proposed to be mitigated at 0.5:1 (DEIS at pg C.2-65). Other solar energy projects proposed to impact Mojave fringe-toed lizard habitat have identified mitigation ratios of 5:1 and 3:1 for direct impacts to all occupied Mojave fringe-toed lizard habitat. The DEIS fails to identify why different mitigation ratios are being used in different areas, when clearly the direct impacts will affect all occupied habitat of Mojave fringe-toed lizards on the site, as well as directly impact down wind sand deposits as well.

The DEIS also fails to evaluate the impacts of the proposed project on Mojave fringe-toed lizard outside of the project site. As Barrows et al. (2006)[7] found, edge effects are significant for fringe-toed lizards and, in addition, the increase in predators associated with developed edges may also have a significant adverse effect on fringe-toed lizards and other species.

4. Rare and Special Status Plants

As mentioned above, the botanical surveys were one of the inadequate surveys identified, and 2010 surveys were/are being done (DEIS at C.2-3). These incomplete data sets preclude evaluation of the impacts, or more importantly the ability to design the project to avoid and minimize impacts. Clearly a supplemental DEIS is required to present these missing data.

5. Migratory Birds and Raptors

Birds

The DEIS downplays the fatalities that have been documented to occur from birds running into mirrors[8]. The proposed project site includes 60 acres of evaporation ponds (DEIS at ES-5), which also attract birds and small mammals. The DEIS does not quantify the number of

[7] Barrows et al. 2006
[8] McCrary 1986

birds (rare, migratory or otherwise) that use/traverse the project site from the avian point count surveys, nor does it evaluate the impact to birds. McCrary et al.[9] estimated 1.7 birds deaths per week on a 32 ha site with mirrors and a power tower configuration. The proposed project site is approximately 728 ha (over 20 times larger). While it is a solar trough technology and has a different kind of mirror and power plant configuration McCrary et al. evaluated, impacts to avian species from reflective surfaces and power lines[10] are also a concern. Once again, the DEIS incorrectly considers the impacts of collisions of birds into mirrors as indirect impacts (DEIS at C.2-63). The revised DEIS needs to analyze likely impacts to birds from the proposed project and mirror configuration based on the point counts. The failure to provide the baseline data from which to make any impact assessment violates NEPA. This failure to analyze impacts is not only a NEPA violation, but for migratory birds, may also lead to a violation of the Migratory Bird Treaty Act, 16 U.S.C. §§ 703 -711, because migratory birds may be "taken" if the proposed project is constructed. Bio-16 requires an Avian Protection Plan which is proposed to "monitor death and injury of birds from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight, and to implement adaptive management measures to minimize such impacts" (DEIS at pg. C.2-183). However, the Avian Protection Plan is not available to the public and decision makers to allow an assessment of impacts to migratory birds.

Between sixty acres (DEIS at ES-5) and forty-eight acres (DEIS at C.2-95) – the DEIS gives conflicting information - of evaporation ponds are part of the project. While Bio-21 lays out a strategy for netting and monitoring the evaporation ponds, which we support, additional avoidance of impacts to wildlife should be included in the supplemental DEIS that places these ponds in the center of the solar facility, to minimize attraction to wildlife.

Additionally Executive Order 13186 states "Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations." [11] Furthermore the EO states that goals pursuant to the MOU include "3) prevent or abate the pollution or detrimental alteration of the Environment for the benefit of migratory birds, as practicable;" and "(6) ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;". Clearly, the supplemental DEIR needs to adequately identify the migratory bird issues on site and evaluate the impact to those species in light of the guidance in Executive Order 13186.

Burrowing Owls

The DEIS notes that two burrowing owls were located in the proposed project area (DEIS at C.2-79). Preliminary results from the 2006-7 statewide census identified that the Sonoran

[9] Ibid
[10] Klem 1990, Erickson et al. 2005
[11] http://ceq.hss.doe.gov/nepa/regs/eos/eo13186.html

desert harbors few Western burrowing owls.[12] The DEIS fails to evaluate the potential impact of the proposed project on this regional distribution of owls.

While "passive relocation" does minimize immediate direct take of burrowing owls, ultimately the burrowing owls' available habitat is reduced, and "relocated" birds are forced to compete for resources with other resident burrowing owls and may move into less suitable habitat, ultimately resulting in "take". While Bio-18 requires a Burrowing Owl mitigation plan, that plan is not provided. As with other species, the lack of these plans does not enable the evaluation of proposed mitigation. Additionally, the requirements of the plan do not explicitly include long-term monitoring of passively relocated birds in order to evaluate survivorship of passively relocated birds.

Golden Eagle

According to the DEIS, no golden eagles were documented on the project site and the nearest nest is identified as being 14 miles away from the proposed project. However, the Center is aware that subsequent surveys for golden eagle nests were conducted nests were found within 10 miles of the proposed project[13]. The DEIS fails to present exactly how to mitigate the loss of a substantial amount of foraging habitat for the golden eagle. The fact still remains that significant amounts of foraging habitat will decrease carrying capacity of the landscape and could result in a potential loss of habitat needed to support a nesting pair, which would impact reproductive capacity.

Scientific literature on this subject is clear - the presence of humans detected by a raptor in its nesting or hunting habitat can be a significant habitat-altering disturbance even if the human is far from an active nest[14]. Regardless of distance, a straight-line view of disturbance affects raptors, and an effective approach to mitigate impacts of disturbance for golden eagles involves calculation of viewsheds using a three-dimensional GIS tool and development of buffers based on the modeling[15]. Golden eagles have also been documented to avoid industrialized areas that are developed in their territory.[16] Additionally, the DEIS does not actually clearly analyze the impacts to and mitigations for the golden eagle under the Bald Eagle and Golden Eagle Protection Act, which prohibits, except under certain specified conditions, the take, possession, and commerce of such birds.

In addition, the potential impacts to eagles (and other birds) from the gen-tie line are not identified or analyzed including the potential for collisions and electrocution.

6. Badger and Desert Kit Foxes

Badgers and desert kit foxes were identified to occur throughout the project area (DEIS C.2-4). Literature on the highly territorial badger indicates that badger home territories range

[12] IBP 2008
[13] WRI 2010
[14] Richardson and Miller 1997
[15] Camp et al. 1997; Richardson and Miller 1997
[16] Walker et al. 2005

from 340 to 1,230 hectares[17]. Therefore, the proposed project could displace *at least* one badger territory. While surveys prior to construction are clearly essential, even passive relocation of badgers into suitable habitat may result "take". Excluding badger from the site is likely to cause badgers to move into existing badger's territory. The same scenario of passive relocation for kit fox may also result in "take". Studies need to be provided on both on- and off-site badger and kit fox territories if animals are to be passively relocated in order to increase their chances of persistence. At a minimum, the revised or supplemental DEIS should identify suitable habitat nearby if the project is relying on passive relocation as a mitigation strategy in order to get the animals to move into the best available habitat.

7. Cryptobiotic soil crusts and Desert Pavement

The proposed project is located in the Mojave Desert Air Quality Management District area, which is already in non-attainment for PM-10 particulate matter[18]. The construction of the proposed project further increases emissions of these types of particles because of the disruption and elimination of potentially hundreds of acres of cryptobiotic soil crusts. Cryptobiotic soil crusts are an essential ecological component in arid lands. They are the "glue" that holds surface soil particles together precluding erosion, provide "safe sites" for seed germination, trap and slowly release soil moisture, and provide CO_2 uptake through photosynthesis[19].

The FEIS does not describe the on-site cryptobiotic soil crusts. The proposed project will disturb an unidentified portion of these soil crusts and cause them to lose their capacity to stabilize soils and trap soil moisture. The DEIS fails to provide a map of the soil crusts over the project site, and to present any avoidance or minimization measures. It is unclear how many acres of cryptobiotics soils will be affected by the project. The DEIS must identify the extent of the cryptobiotic soils on site and analyze the potential impacts to these diminutive, but essential desert ecosystem components as a result of this project.

While desert pavements are mentioned as occurring on the proposed project site (DEIS at C.9-44), quantitative acreage of pavement are not identified. Disruption of these stabilized soils could have significant impacts on air quality. The impact to air quality from disturbance of desert pavement is not analyzed.

8. Insects

The DEIS fails to address insects on the proposed project site. In fact no surveys or evaluation of rare or common insects are included in the DEIS. Dune habitats are notorious for supporting endemic insects, typically narrow habitat specialists[20].

9. Bats

While no bats were noted on site during general wildlife surveys, no bat-specific surveys were undertaken. With the introduction of 48-60 acres of evaporation ponds, bats may actually

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[17] Long 1973, Goodrich and Buskirk 1998

[18] http://www.mdaqmd.ca.gov/index.aspx?page=214

[19] Belnap 2003, Belnap et al 2003, Belnap 2006, Belnap et al. 2007

[20] Dunn 2005.

be attracted to the proposed project site. The mitigation measure proposed for netting ponds may help to preclude bats from using the ponds also. However, smaller gauge netting may be more useful in keeping bats out of the ponds. Alternatively, for many reasons, the proposed project should be a dry cooled project, minimizing the amount of water and evaporation ponds required. Regardless, no analysis of the impacts to bats is provided in the DEIS. At a minimum, after the analysis is provided in the supplemental DEIS, a Bat Protection Plan needs to be required.

10. Decommissioning and Reclamation Plan

Desert lands are notoriously hard to revegetate or rehabilitate[21] and revegetation never supports the same diversity that originally occurred in the plant community prior to disturbance[22]. The task of revegetating almost eleven square miles will be a Herculean effort that will require significant financial resources. In order to assure that the ambitious goals of the revegetation effort is met post project closure, it will be necessary to bond the project, so that all revegetation obligations will be met and assured. The bond needs to be structured so that it is tied to meeting the specific revegetation criteria.

The project will cause permanent impacts to the on-site plant communities and habitat for wildlife despite "revegetation", because the agency's regulations based on the Northern and Eastern Colorado Plan's rehabilitation strategies[23] only requires 40% of the original density of the "dominant" perennials, only 30% of the original cover. Dominant perennials are further defined as "any combination of perennial plants that originally accounted cumulatively for at least 80 percent of relative density".[24] These requirements fail to truly "revegetate" the plant communities to their former diversity and cover even over the long term. While Bio-23 requires the development of a Decommissioning Plan, that plan is not available for public review. In fact, the DEIS states that "The Applicant's Draft Decommissioning and Closure Plan (Worley Parsons 2010b) provides some of the information requested by staff, but does not include a conceptual revegetation plan that could be used to guide reclamation of the Project site after closure and decommissioning, nor does it provide sufficient information to develop an estimate of the funding needed for those activities" DEIS at C.2-101. BLM's own regulations 43 CFR 3809.550 et seq. require a detailed reclamation plan and a cost estimate, they need to be included in the revised EIS. A comprehensive decommissioning plan must be developed for the whole project site. This plan must be included in the revised or supplement DEIS in order to evaluate its effectiveness as mitigation.

11. Fire Plan

Fire in desert ecosystems is well documented to cause catastrophic landscape scale changes[25] and impacts to the local species[26]. The DEIS mentions the impacts of fire via the

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[21] Lovich and Bainbridge 1999
[22] Longcore 1997
[23] http://www.blm.gov/ca/st/en/fo/cdd/neco.html
[24] Ibid
[25] Brown and Minnich 1986, Lovich and Bainbridge 1999, Brooks 2000, Brooks and Draper 2006, Brooks and Minnich 2007

proliferation of nonnative weeds (DEIS at C.2-21), it fails to analyze the impacts of fire on adjacent natural desert habitat. The DEIS fails to adequately analyze the impact that an escaped fire originated from the proposed project could have on the natural lands adjacent to the project site if it escaped from the site. The DEIS also fails to address the mitigation of this potential impact. Instead it defers it to the Worker Environmental Awareness Program (WEAP) and only requires "a discussion of fire prevention measures to be implemented by workers during project activities" (DEIS at C.2-164). A fire prevention and protection plan needs to be developed and required to prevent the escape of fire onto the adjacent landscape (avoidance), lay out clear guidelines for protocols if the fire does spread to adjacent wildlands (minimization) and a revegetation plan if fire does occur on adjacent lands originating from the project site (mitigation) or caused by any activities associated with construction or operation of the site even if the fire originates off of the project site.

12. Failure to Identify Appropriate Mitigation

Because the DEIS fails to provide adequate identification and analysis of impacts, inevitably, it also fails to identify adequate mitigation measures for the project's environmental impacts. "Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' 42 U.S.C. § 4332(C)(ii), is an understanding that an EIS will discuss the extent to which adverse effects can be avoided." *Methow Valley*, 490 U.S. at 351-52. Because the DEIS does not adequately assess the project's direct, indirect, and cumulative impacts, its analysis of mitigation measures for those impacts is necessarily flawed. The DEIS must discuss mitigation in sufficient detail to ensure that environmental consequences have been fairly evaluated." *Methow Valley*, 490 U.S. at 352; *see also Idaho Sporting Congress*, 137 F.3d at 1151 ("[w]ithout analytical detail to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a 'mere listing' of good management practices"). As the Supreme Court clarified in *Robertson*, 490 U.S. at 352, the "requirement that an EIS contain a detailed discussion of possible mitigation measures flows both from the language of [NEPA] and, more expressly, from CEQ's implementing regulations" and the "omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action forcing' function of NEPA."

Although NEPA does not require that the harms identified actually be mitigated, NEPA does require that an EIS discuss mitigation measures, with "sufficient detail to ensure that environmental consequences have been fairly evaluated" and the purpose of the mitigation discussion is to evaluate whether anticipated environmental impacts *can be avoided*. *Methow Valley*, 490 U.S. at 351-52. As the Ninth Circuit recently noted: "[a] mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination." *South Fork Band Council of Western Shoshone v. DOI* , 588 F.3d 718 , 727 (9th Cir. 2009) (emphasis in original).

Here, the DEIS does not provide a full analysis of possible mitigation measures to avoid or lessen the impacts of the proposed project and therefore the BLM cannot properly assess the likelihood that such measures would actually avoid the impacts of the proposed project.

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[26] Dutcher 2009

D. Key Plans Not Included

The DEIS fails to include key plans for public review. Plans identified in the DEIS and relied upon for adequate mitigation but which are unavailable include:

- Weed Management Plan (DEIS at C.2-181)
- Biological Resources Mitigation Implementation and Monitoring Plan (DEIS at C.2-165)
- Raven Management and Monitoring Plan (DEIS at C.2-181)
- Detailed revegetation plan for temporary disturbance (DEIS at C.2-198)
- Decommissioning and Reclamation Plan (for permanent closure) (DEIS at C.2-197)
- Burrowing Owl Mitigation and Monitoring Plan (DEIS at C.2-185)
- Avian Protection Plan (DEIS at C.2-183)
- Desert Tortoise Relocation/Translocation Plan (DEIS at C.2-174)
- Management Plan for Compensatory Mitigation Lands (DEIS at C.2-192) for tortoise, fringe-toed lizards, drainages etc.
- Special-status Plant Impact Avoidance and Mitigation Plan (DEIS at C.2-187)
- Ground Water Dependent Vegetation Monitoring Plan (DEIS at C.2-199), which should include a remedial action plan if vegetation shows signs of stress
- Couch's Spadefoot Toad Protection and Mitigation Plan (DEIS at C.2-202)

Plans that are not currently required but need to be included:

- Compensatory Mitigation Plan for State Waters
- Desert Tortoise Compensatory Mitigation Plan
- Bat Protection Plan
- Plan for restoring sheet flow to the terrain downslope of the Project boundaries
- Management Plan for Sand Dune/Fringe-toed Lizard
- Fire Plan

All of these plans are key components to evaluating the avoidance, minimization and mitigation to biological resources by the proposed project. Some of these plans were submitted to agencies in draft form, but were not included in the DEIS. Their absence makes it impossible to evaluate the impacts from the proposed project. Each of these plans needs to be included in the supplemental EIS.

E. Impacts to Water Resources— Surface and Groundwater Water Impacts

As the DEIS notes, the proposed project is on an alluvial fan and it may impact a large number of small braided washes and ephemeral streams. DEIS at C.9-1, C.9-35 to 36. These areas provide important habitat values that will be completely lost by the grading proposed for the project site. Moreover, the loss of natural surface water flows and the re-direction of surface waters will have significant impacts to the dunes ecosystems nearby. The impacts on soils and particularly on sand transport from the proposed project have not been adequately addressed in the DEIS.

The Center urges the BLM not to approve any large-scale solar projects in the California Desert that would use wet-cooling as proposed here. The proposal to use an average of 1,644

acre-feet/yr and nearly 50,000 acre-feet over the 30-year life of the project is excessive and wasteful. DEIS at C.9-5.[27] Wet-cooling is also entirely unnecessary as evidenced by other project proposals with similar trough technology that are proposed with dry cooling and would use far less water (e.g. Palen and Blythe) as well as PV alternatives which would use even less water. The Center sponsored testimony for the CEC hearings from hydrologist Tom Myers PhD (Attachment 1) shows that the DEIS overestimates recharge in this area and underestimates the impacts of groundwater pumping under the wet-cooling alternative.

Even with the dry cooling alternative, the amount of water use by the proposed project will be significant in this arid area and the DIES does not contain sufficient information to show that surface resources on other public lands will not be affected by the drawdown of the water table *over the life of the project*. Moreover, the cumulative impacts to groundwater resources from this project and others in the area could be significant annually and over the life of the project.

Reserved Water Rights: As BLM is well aware, the California Desert Protection Act ("CDPA") expressly reserved water rights for wilderness areas that were created under the act including the Palen-McCoy Wilderness and others. 16 U.S.C. §410aaa-76.[28] The CDPA reserved sufficient water to fulfill the purposes of the Act which include to "preserve unrivaled scenic, geologic, and wildlife values associated with these unique natural landscapes," "perpetuate in their natural state significant and diverse ecosystems of the California desert," and "retain and enhance opportunities for scientific research in undisturbed ecosystems." 103 P.L. 433, Sec. 2. The priority date of such reserved water rights is 1994 when the CDPA was enacted. Therefore, at minimum, the BLM must ensure that use of water for the proposed project (and cumulative projects) *over the life of the proposed projects* will not impair those values in the wilderness that depend on water resources (including perennial, seasonal, and ephemeral creeks, springs and seeps as well as any riparian dependent plants and wildlife), including the McCoy Spring which is located within a wilderness area.

The conclusory statements in the DEIS that the use of large amounts of groundwater will not affect McCoy Spring or other water resources are based on conjecture alone and are not adequately supported with data or analysis. DEIS at C.9-36 ("McCoy Spring and Chuckwalla Spring are perennial springs; however, there is no information available regarding the discharge quantity for these springs.") NEPA requires that where there is incomplete information that is relevant to the reasonably foreseeable impacts of a project and essential for a reasoned choice among alternatives, the BLM must obtain that information unless the costs of doing so would be exorbitant or the means of obtaining the information are unknown. 40 C.F.R. § 1502.22. Here the costs are reasonable to obtain information needed regarding these springs and any other

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[27] Using large amounts of water for cooling will also lead to large amounts of evaporative residue "Approximately 6,150 tons of evaporative residue will be accumulated yearly, which equates to approximately 50,000 tons of evaporative residue being removed during each cleanout and a total estimated amount of 214,500 tons over 30 years." DEIS at C.9-52. The removal and disposal of this waste has not been adequately addressed in the DEIS and is entirely avoidable by the use of dry-cooling.

[28] The reservation excluded two wilderness areas with regard to Colorado River water. See 103 P.L. 433; 108 Stat. 4471; 1994 Enacted S. 21; 103 Enacted S. 21, SEC. 204. COLORADO RIVER. ("With respect to the Havasu and Imperial wilderness areas designated by subsection 201(a) of this title, no rights to water of the Colorado River are reserved, either expressly, impliedly, or otherwise.")

nearby springs and to complete the analysis and therefore the BLM must provide additional information in the EIS—through a supplement or revised EIS. The irreplaceable water resources of the CDCA must be protected by the BLM under existing law.

Even where no *express* reservation of rights has been made for waters that are essential to the resources of public lands in the CDCA, the DEIS should have addressed the federal reserved water rights afforded to the public to protect surface water sources on all public lands affected by the proposed project. Pursuant to Public Water Reserve 107 ("PWR 107"), established by Executive Order in 1926, government agencies cannot authorize activities that will impair the public use of federal reserved water rights.

PWR 107 creates a federal reserved water right in water flows that must be maintained to protect public water uses. *U.S. v. Idaho*, 959 P.2d 449,453 (Idaho, 1998) *cert. denied; Idaho v. U.S.* 526 U.S. 1012 (1999); *Cappaert v. U.S.*, 426 U.S. 128, 145 (1976). PWR 107 applies to reserve water that supports riparian areas, reserve water that provides flow to adjacent creeks and isolated springs that are "nontributary" or which form the headwaters of streams. *U.S. v. City & County of Denver*, 656 P.2d 1, 32 (Colo., 1982). Accordingly, BLM cannot authorize activities that will impair the public use of reserved waters covered by PWR 107.

BLM must examine the federal reserved water rights within the area affected by the proposed project and other proposed projects in this area that will cumulatively use significant amounts of groundwater. This examination must include a survey of the any water sources potentially affected by the proposed project. The BLM must ensure that any springs, seeps, creeks or other water sources on public land and particularly within the wilderness areas are not degraded by the proposed projects' use of water and continue meet the needs of the existing wildlife and native vegetation that depend on those water resources.

PWR 107 also protects the public lands on which protected water sources exist. Accordingly, BLM should not only consider the impact of the proposed project's excessive use of groundwater on water sources present on public lands, but also the direct and indirect impacts of the proposed project's excessive and unnecessary use of groundwater on the surrounding lands as well as impacts to the ecosystem as a whole.

The Center is also concerned that the discussion in the DEIS is also incomplete because it fails to address any potential water rights that could arguably be created from use of any amount of groundwater by the proposed project on these public lands. While the Center recognizes that this issue may involve somewhat complex legal issues, at minimum, the BLM must address this question and to ensure that any water rights that could *arguably* be created will be conveyed back to the BLM owner and run with the land at the end of the proposed project ROW term. The BLM must provide a mechanism to insure that in no case will the use of water for the proposed project on these public lands result in water rights accruing to the project applicant that it could arguably convey to any third party. Therefore, any water rights *arguably* created by groundwater pumping on these public lands for the proposed project must not ultimately accrue to any third party for use *off-site or on-site* in the future for any other project. Moreover, BLM should ensure that the applicant will not use the groundwater associated with the project off-site for any purpose.

In sum, the wet-cooling alternative would waste water resources (in violation of California law) and significantly impact resources of these public lands. These impacts have not been adequately or accurately identified or analyzed in the DEIS in violation of NEPA and other laws.

F. The DEIS Fails to Adequately Identify, Analyze and Off-set Impacts to Air Quality and GHG Emissions.

Federal courts have squarely held that NEPA requires federal agencies to analyze climate change impacts. *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 508 F.3d 508 (9th Cir. 2007). As most relevant here, NEPA requires consideration of greenhouse gas emissions ("GHG emissions") associated with all projects and, in order to fulfill this requirement the agencies should look at all aspects of the project which may create greenhouse gas emissions including operations, construction, and life-cycle emissions from materials. Where a proposed project will have significant GHG emissions, the agency should identify alternatives and/or mitigation measures that will lessen such effects.

As part of the NEPA analysis federal agencies must assess and, wherever possible, quantify or estimate GHG emissions by type and source by analyzing the direct operational impacts of proposed actions. Assessment of direct emissions of GHG from on-site combustion sources is relatively straightforward. For many projects, as with the proposed project, energy consumption will be the major source of GHGs. The indirect effects of a project may be more far-reaching and will require careful analysis. Within this category, for example, the BLM should evaluate, GHG and GHG-precursor emissions associated with construction, electricity use, fossil fuel use, water consumption, waste disposal, transportation, the manufacture of building materials (lifecycle analysis), and land conversion. Moreover, because many project may undermine or destroy the value of carbon sinks, including desert soils, projects may have additional indirect effects from reduction in carbon sequestration, therefore both the direct and quantifiable GHG emissions as well as the GHG effects of destruction of carbon sinks should be analyzed.

The discussion of greenhouse gas emissions ("GHG") in the DEIS notes that the solar project will produce GHGs primarily from the auxiliary gas boilers (however the emissions from the Heat Transfer Fluid ("HTF") heaters are not listed). The GHG emissions from the boilers during project operations is estimated to be 3,520 metric tons CO2 equivalent (however the emissions from the HTF heaters are not listed), with the metric tons CO2 equivalent annually for total operations emissions (including all sources) of 4,133 metric tons CO2 equivalent annually. DEIS at C.1-73 (Greenhouse gas table 3). The boilers and heaters are stated to be for start up or freeze protection(DEIS at C.1-73), but the DEIS assumes that they may be allowed to be used for very long periods of time – up to 14 hours per day for the boilers up to 1,000 hours per year. *See* DEIS at C.1-52 (no clear limits on the HTF heaters is provided). With an average of 3 hours per day of use the limits for the auxiliary heaters appear to be reasonably in line with the use for start up however no clear explanation is provided regarding the GHG produced by the HTF heaters or the likely time period for use of such heaters. The DEIS also fails to adequately explore whether an alternative solar technology (such as PV) would reduce greenhouse gas emissions both during

operations and over the life-cycle of the components of the proposed project. There is no discussion of reducing these sources by using alternative fuels or highly efficient vehicles and equipment on site and no discussion of providing off sets for these GHG emissions.

Another GHG emission source for this proposed project is SF6 from electrical equipment leakage. DEIS at C.1-73. However, the DEIS does not mention additional sources of SF6 from transmission lines associated with the project. Moreover, leakage of SF6 is of particular concern as it is many times more potent greenhouse gas than CO2—indeed, its potential as a GHG has been estimated at 23,900 times that of CO2 (for a 100 year time horizon) and it can persist in the atmosphere far longer than CO2 as well—up to 3,200 years.[29] The DEIS fails to state the actual amount of SF6 that is estimated to leak from equipment and provides only that 3.4 MTCO2E is expected in emissions each year. No information is provided on the calculation. Moreover, the DEIS does not analyze any alternatives to avoid or minimize the long-term emissions of this powerful GHG from operations and no mitigation measures are provided. The DEIS also does not explain if the figure includes SF6 leakage associated with the gen-tie line or not.

The GHG emissions from the construction phase of the project are stated to be over 52,974 metric tons CO2 equivalent (Greenhouse gas table 2, DEIS C.1-72). Again, there is no discussion of reducing these emissions by using more efficient equipment or vehicles during construction.

The DEIS also fails to adequately address other air quality issues including PM10 both during construction and operation which is of particular concern in this area which is a nonattainment area for PM10 and ozone. It is clear that extensive on-site grading will result in significant amounts of bare soils and increased PM10 may be introduced into the air by wind and that the use of the area during construction and operations will lead to additional PM10 emissions from the site. Although some mitigation measures are suggested they are not specific and enforceable and because the extent of the impact has not been adequately addressed as an initial matter there is no way to show that the mitigation measures proffered will reduce the impacts to less than significance.

BLM fails to identify any significant GHG emissions and therefore does not provide for avoidance, minimization, or mitigation. BLM has also failed to include the loss of carbon sequestration from soils in its calculations or to provide a lifecycle analysis of GHG emissions that include manufacturing and disposal. Moreover, it is undisputed that in the near-term GHG emissions will increase emissions during construction, and in the manufacturing and transportation of the components. BLM fails to consider any alternatives to the project that would minimize such emissions or to require that these near-term emissions be off set in any way.

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[29] P. Forster et al., *Changes in Atmospheric Constituents and in Radiative Forcing, in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Solomon, S., et al. eds., Cambridge University Press 2007) at p. 212, Table 2.14.

Although the proposed project may reduce GHG's overall it will also emit GHGs during both construction and operations that are not accounted for or off-set, BLM completely fails to explore this aspect of the impacts of the project in the DEIS in violation of NEPA.

G. The Analysis of Cumulative Impacts in the DEIS Is Inadequate

A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. The Ninth Circuit requires federal agencies to "catalogue" and provide useful analysis of past, present, and future projects. *City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142, 1160 (9th Cir. 1997); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809-810 (9th Cir. 1999).

"In determining whether a proposed action will significantly impact the human environment, the agency must consider '[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.' 40 C.F.R. § 1508.27(b)(7)." *Oregon Natural Resources Council v. BLM,* 470 F.3d 818, 822-823 (9th Cir. 2006). NEPA requires that cumulative impacts analysis provide "some quantified or detailed information," because "[w]ithout such information, neither courts nor the public . . . can be assured that the Forest Service provided the hard look that it is required to provide." *Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1988); *see also id*. ("very general" cumulative impacts information was not hard look required by NEPA). The discussion of future foreseeable actions requires more than a list of the number of acres affected, which is a necessary but not sufficient component of a NEPA analysis; the agency must also consider the actual environmental effects that can be expected from the projects on those acres. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995-96 (9th Cir. 2004) (finding that the environmental review documents "do not sufficiently identify or discuss the incremental impact that can be expected from each [project], or how those individual impacts might combine or synergistically interact with each other to affect the [] environment. As a result, they do not satisfy the requirements of the NEPA.") Finally, cumulative analysis must be done as early in the environmental review process as possible, it is not appropriate to "defer consideration of cumulative impacts to a future date. 'NEPA requires consideration of the potential impacts of an action *before* the action takes place.'" *Neighbors*, 137 F.3d at 1380 *quoting City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1313 (9th Cir. 1990) (emphasis in original).

The DEIS identifies many of the cumulative projects but does not meaningfully analyze the cumulative impacts to resources in the California desert from the many proposed projects (including renewable energy projects and others). Moreover, because the initial identification and analysis of impacts unfinished, the cumulative impacts analysis cannot be complete. For example, the identification of plant communities on site is unfinished and incomplete as is the evaluation of the impacts of the second access road and the Colorado River substation expansion, the cumulative impacts are also therefore inadequate.

The DEIS also fails to consider all reasonably foreseeable impacts in the context of the cumulative impacts analysis. *See Native Ecosystems Council v. Dombek, et al,* 304 F.3d 886 (9th Cir. 2002) (finding future timber sales and related forest road restriction amendments were "reasonably foreseeable cumulative impacts"). The DEIS also fails to provide the needed analysis of how the impacts might combine or synergistically interact to affect the environment in this valley or region. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995-96 (9th Cir. 2004).

The NEPA regulations also require that indirect effects including changes to land use patterns and induced growth be analyzed. "Indirect effects," include those that "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include *growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems*." 40 C.F.R. s.1508.8(b) (emphasis added). *See TOMAC v. Norton*, 240 F. Supp.2d 45, 50-52 (D.D.C. 2003) (finding NEPA review lacking where the agency failed to address secondary growth as it pertained to impacts to groundwater, prime farmland, floodplains and stormwater run-off, wetlands and wildlife and vegetation); *Friends of the Earth v. United States Army Corps of Eng'rs*, 109 F. Supp.2d 30, 43 (D.D.C. 2000) (finding NEPA required analysis of inevitable secondary development that would result from casinos, and the agency failed to adequately consider the cumulative impact of casino construction in the area); *see also Mullin v. Skinner*, 756 F. Supp. 904, 925 (E.D.N.C. 1990) (Agency enjoined from proceeding with bridge project which induced growth in island community until it prepared an adequate EIS identifying and discussing in detail the direct, indirect, and cumulative impacts of and alternatives to the proposed Project); *City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential that it would create).

Among the cumulative impacts to resources that have not been fully analyzed are impacts to desert tortoise, impacts to Mojave fringe-toed lizard and sand dunes ecosystems, impacts to golden eagles, and impacts to water resources. The cumulative impacts to the resources of the California deserts has not been fully identified or analyzed, and mitigation measures have not been fully analyzed as well.

H. The EIS' Alternatives Analysis is Inadequate

NEPA requires that an EIS contain a discussion of the "alternatives to the proposed action." 42 U.S.C. §§ 4332(C)(iii),(E). The discussion of alternatives is at "the heart" of the NEPA process, and is intended to provide a "clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. §1502.14; *Idaho Sporting Congress*, 222 F.3d at 567 (compliance with NEPA's procedures "is not an end in itself . . . [but] it is through NEPA's action forcing procedures that the sweeping policy goals announced in § 101 of NEPA are realized.") (internal citations omitted). NEPA's regulations and Ninth Circuit case law require the agency to "rigorously explore" and objectively evaluate "all reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added); *Envtl. Prot. Info. Ctr. v. U.S. Forest Serv.*, 234 Fed.

Appx. 440, 442 (9th Cir. 2007). "The purpose of NEPA's alternatives requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Envtl. Defense Fund, Inc. v. U.S. Army Corps of Engrs.*, 492 F.2d 1123, 1135 (5th Cir. 1974). An agency will be found in compliance with NEPA only when "all reasonable alternatives have been considered and an appropriate explanation is provided as to why an alternative was eliminated." *Native Ecosystems Council v. U.S. Forest Serv.,* 428 F.3d 1233, 1246 (9th Cir. 2005); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228-1229 (9th Cir. 1988). The courts, in the Ninth Circuit as elsewhere, have consistently held that an agency's failure to consider a reasonable alternative is fatal to an agency's NEPA analysis. *See, e.g., Idaho Conserv. League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992) ("The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate.").

If BLM rejects an alternative from consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. § 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record. *See Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999); *Idaho Conserv. League*, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); *Citizens for a Better Henderson*, 768 F.2d at 1057.

Here, BLM too narrowly construed the project purpose and need such that the DEIS did not consider an adequate range of alternatives to the proposed project. Moreover, the project description remains incomplete as there is the outstanding issue of a second access road. The applicant recently suggested a "spur" road off the main proposed access road but it is not yet clear whether the local emergency management authorities in the County would accept this as providing sufficient safety for workers or the public.

The alternatives analysis is inadequate even with the inclusion of a reduced acreage alternative and the dry cooling alternative. Additional feasible alternatives should be considered which would avoid all of the dunes habitat as well as alternatives that would have looked at alternative sites for the Colorado River substation to avoid impacts to additional resources. In addition a phased alternative should have been included which would allow the portions of the project that have the fewest impacts to move forward while also affording the project proponent time to find and acquire permits for more appropriate sites for one or more additional phases of the project reconfigured on other BLM lands or on previously degraded disturbed lands in this area (for example such as the lands discussed in the Gabrych Alternative) and also to explore other off-site alternatives.

The document also includes other alternatives that were stated as being "Site Alternatives Evaluated only under CEQA" which includes the proposed site and one off-site alternative – the Gabrych Alternative which is on active farmland in the Blythe area. The document eliminated from consideration a distributed renewable energy alternative. The BLM (as well as the CEC) should have also looked alternative siting on previously degraded lands such as nearby farmlands, distributed solar alternatives, and other alternatives that could avoid impacts of the proposed project as well as impacts of the associated transmission lines and substations. In

addition, as discussed above, the BLM should have looked at alternatives for construction and operations that would reduce GHG emissions by using alternative technology and/or on site conservation measures and offsets. The Center sponsored testimony from Bill Powers in the CEC process (Attachment 2) which shows that a distributed PV alternative is viable and should have been fully considered in the DEIS.

The BLM failed to consider any off-site alternative that would significantly reduce the impacts to biological resources including dunes ecosystems, key movement corridors, golden eagles, and others. Because such alternatives are feasible, on this basis and other the range of alternatives is inadequate. The Center urges the BLM to revise the DEIS to adequately address a range of feasible alternatives and other issues detailed above and then to re-circulate a revised or supplemental DEIS for public comment.

In addition, in order to meet the DOE's purpose and need states that: "The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for action by DOE is to comply with their mandate under EPAct by selecting eligible projects that meet the goals of the Act." DEIS at B.2-11. Assuming for the sake of argument alone that these are proper project objectives, the DEIS should have considered alternatives that would provide funding to other types of projects. Such alternatives could include, for example, conservation and efficiency measures that both avoid and reduce energy use within high-energy use load-centers including the Los Angeles area and the Inland Empire.

Alternative measures could include funding community projects for training and implementation of conservation measures such as increased insulation, sealing and caulking, and new windows for older buildings and new or improved technologies for accomplishing these important goals. For example, air conditioning creates the largest demand for energy during peak times and there already exist methods to reduce the energy use from air conditioning but implementation has lagged well behind technology. Conservation and efficiency measures are an excellent and quick way of reducing demand in both the short- and long-term and reduce the need for additional power sources. In addition, many of the existing conservation and efficiency measures can provide immediate jobs and training in high population areas with significant unemployment (particularly among low skilled workers and youth).

The existence of these and other feasible but unexplored alternatives shows that the BLM's analysis of alternatives in the DEIS is inadequate.

IV. Conclusion

Thank you for your consideration of these comments. In light of the many omissions in the environmental review to date, we urge the BLM to revise and re-circulate the DEIS or prepare a supplemental DEIS before making any decision regarding the proposed plan amendment and right-of-way application. In the event BLM chooses not to revise the DEIS and provide adequate analysis, the BLM should reject the right-of-way application and the plan amendment. Please feel free to contact us if you have any questions about these comments or the documents provided.

Sincerely,

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Attachment 1: Testimony of Tom Myers and exhibits (exhibits provided on CD)
Attachment 2: Testimony of Bill Powers and exhibits (exhibits provided on CD)

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STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of:	
APPLICATION FOR CERTIFICATION FOR THE GENESIS SOLAR ENERGY PROJECT	DOCKET NO. 09-AFC-8

INTERVENOR CENTER FOR BIOLOGICAL DIVERSITY

Testimony of Tom Myers

Re: Impacts to Water Resources from the Proposed Genesis Solar Energy Project

Docket 09-AFC-8

Summary of Testimony

The proposed project will have a significant impact to water resources that have not been adequately addressed to date. The SA and Revised SA and the hydrology reports from the applicant's contractor vastly underestimate the impacts the proposed project will have on the groundwater balance and flow systems of Chuckwalla Valley and the nearby Colorado River. As an initial matter, the recharge to the basin is overstated by many times which leads to a significant overestimate of the perennial yield. Moreover, the discussion of the deep aquifer and the impacts of the proposed pumping of up to 1650 af/y on the shallow aquifer are based on unsubstantiated assumptions of the aquifer and inaccurate groundwater modeling. As a result, the identification and analysis of impacts of the proposed water use is inadequate.

The proposed project in itself as well as in conjunction with other cumulative projects would significantly impact groundwater resources and cause far larger drawdown of the aquifer than acknowledged in the SA and Revised SA.

Qualifications

My qualifications are provided on my Resume attached to this Testimony and as discussed below.

I have over 25 years of experience as a hydrogeologist, primarily in Nevada but also including California and the Mojave Desert. Approximately 16 of those years have been

as an independent consultant based in Nevada and working throughout the western United States, including the Great Basin and Mojave Desert of California.

I have a Ph.D and M.S. in Hydrology/Hydrogeology from the University of Nevada Reno. I have a B.S. in Civil Engineering from the University of Colorado. I have continuing education in various aspects of hydrogeology, including fractured rock analysis, groundwater monitoring, and environmental forensics from MidWest Geosciences and National Groundwater Association.

I have published articles on hydrological issues, including groundwater modeling, stochastic modeling, and river morphology in peer-reviewed scientific journals such as the *Journal of Hydrology* and presented papers/posters at professional meetings of hydrologists and water resource professionals.

I have provided expert testimony on hydrological issues and water resources in proceedings before the Nevada State Engineer, Nevada State Environmental Commission, and Billings Federal District Court.

Statement

The project applicant's Groundwater Resources Investigation (GWRI) and Supplement Groundwater Resources Investigation (SGWRI) are inaccurate. The Discussion of Water Resources in the Staff Assessment (SA) and Revised SA are also incomplete and inaccurate. This statement is a review of those documents and is organized into three broad categories: Water Balance, Groundwater Model, and Impact on the Colorado River, along with a References section.

Water Balance

The GWRI discusses various aspects of the water balance and perennial yield for Chuckwalla Valley. With the exception of discharge, the GWRI grossly overestimates all of the water balance components, as explained in the following comments.

1) Water balance is a simple concept in that inflow equals outflow. In groundwater hydrology, it is common to consider water balance at steady state or for pre-development conditions. In this case for predevelopment conditions, recharge plus interbasin inflow equals discharge through evapotranspiration (ET) and springs plus interbasin outflow.
2) The GWRI (at 34) estimates discharge to evapotranspiration (ET) at Palen Lake to be approximately 350 af/y. The discharge is mostly through exfiltration. This estimate is reasonable.
3) The GWRI (at 31) estimates interbasin outflow to Palo Verde Valley to be approximately 400 af/y. This estimate also appears reasonable although it is not possible to examine the original reference. Rather, considering the cross-section from the GWRI, Figure 4, the flow passes a trapezoidal area about 1500 foot thick at its thickest point and about six miles wide for an area about 35,000,000 ft^2 or

4) The estimate for interbasin inflow from Pinto and Orocopia Valley, at 3500 af/y, is very high. To be correct there must be that much recharge in those valleys. Considering the discussion below on recharge for Chuckwalla Valley, such an estimate appears to be very high. Also, the width of the boundary with Chuckwalla Valley, shown on GWRI Figure 6, appears to be less than the boundary with Palo Verde Valley which had been estimated to have just a little more than one-tenth of the estimated inflow from Pinto Valley.
5) Pumping is not part of the pre-development, steady state discharge. It should not be included in the GWRI Table 3-5.
6) Ignoring the pumpage (discussed in the GWRI (at 26-30)), the natural discharge from the valley appears to be approximately 750 af/y.
7) Recharge and interbasin inflow therefore must balance the steady state discharge.

The GWRI has a long discussion on recharge trying to justify an estimate that exceeds the natural discharge by ten times or more. For many reasons, the estimate of recharge is incorrect.

8) The in-basin recharge estimate is grossly too high, based on a comparison with other methods used in the southwest and based on a detailed consideration or understanding of the principles of recharge.
9) The applicant cites favorably the Maxey-Eakin method as an empirical method used in arid basins throughout the Southwest (GWRI, at 23). The report fails to note that application of the method in the Chuckwalla Valley would yield an estimated recharge equal to zero. This is because the Maxey-Eakin method established a recharge efficiency coefficient equal to zero for precipitation zones less than 8 inches/year (in/y) (Avon and Durbin, 1994, at 100). (I used Avon and Durbin (1994) to reference the Maxey-Eakin method because it best describes the methodology and assesses its accuracy.)
10) The GWRI criticizes the Maxey-Eakin recharge methodology citing to Lerner et al (1990); the reference list does not include the citation for this reference so the basis of the criticism cannot be assessed.
11) Avon and Durbin (1994, at 109) estimated new coefficients, finding that for basins with precipitation less than 8 inches the coefficients would be 1.1%; the GWRI does not mention this. Thus, Avon and Durbin's coefficient for areas with less than 8 in/y precipitation implicitly acknowledges that recharge will occur in any basin because there will be wetter years with runoff that does infiltrate into the fans causing recharge. If 1.1% applies to the Chuckwalla basin, the recharge would be about 3465 af/y, or about 1/3rd the value estimated in the GWRI (at 24).
12) Another methodology used in the Southwest and developed by the US Geological Survey is the Anderson method (Anderson, 1995) which also limits recharge to basins which have average precipitation in excess of eight inches (*Id*., at A16).
13) The GWRI references a US Geological Survey study to claim that basinwide recharge rates, for arid Southwestern basins, vary from 3 to 7% of the basinwide precipitation (GWRI, at 23). The citation is to USGS (2007), which is a

14) The USGS recharge sites described in Constantz et al (2007) differ substantially from Chuckwalla Valley in that they have significantly higher elevation and would have significantly less potential ET (PET) than does the Chuckwalla Valley. The Mojave River site faces north and the Amargosa River site is both higher and significantly further north. Both would lead to lower PET than in Chuckwalla Valley. More PET would increase the amount of exfiltration of the infiltrated runoff, thereby decreasing the amount of alluvial fan infiltration which actually becomes recharge.
15) The Mojave River and Amargosa River sites (Constantz et al 2007) are closest in climate and geology to the Chuckwalla Valley. The altitude of the two gages is 1003 and 1234 m amsl (3290 and 4048 ft, respectively), which exceeds the elevation of the lower end of Chuckwalla Valley by from 3000 to 3800 feet. Both of these USGS study watersheds have significantly higher elevation areas which likely have much higher precipitation than does the higher elevations in the Chuckwalla Valley.
16) Waste water and irrigation return flow is not part of the steady state recharge.

The overall groundwater budget discussion mixes development stresses and natural fluxes, as if they should balance (GWRI, at 34, 35). When development occurs, the new discharge initially causes groundwater to be released from storage. As the water table or potentiometric surface lowers, the new discharge begins to capture natural discharge from some area. In this case, it appears the basin is currently being pumped at rates exceeding the perennial yield, as noted below.

17) The GWRI cites a perennial yield estimate of 12,200 af/y, based on Hanson (1992). This reference is a letter, not a peer-reviewed or even agency-reviewed analysis of the amount of water available from the basin. It should not be considered authoritative and should not be relied upon when considering water availability.
18) The GWRI does not estimate perennial yield, but provides a groundwater balance table to suggest that the amount of water available is of the order of the Hanson perennial yield.
19) The groundwater budget table (GWRI, Table 3-5 at 35) shows substantial pumpage – most is in western Chuckwalla Valley. The 1992 groundwater contour map (GWRI, at Figure 11) does not include this area around Desert Center. The hydrographs presented for western Chuckwalla Valley do not continue into the 21st century, the time period for which most of the reported pumping has occurred. Therefore, there is no estimate of the drawdown which must be occurring. At no point does the GWRI consider this flux from storage to the water balance. It would be part of a current water balance for the valley, but the GWRI does not present such a water balance.

20) Using the Avon and Durbin (1994) Maxey-Eakin coefficient estimate and accepting for the sake of argument the 3500 af/y inflow from Pinto and Oracopia Valley, the total natural inflow to the valley would be 6965 af/y. Subtracting the 350 af/y ET discharge at Palen Lake, the interbasin flow to Palo Verde Valley would be 6615 af/y, which would require a conductivity of 28 ft/d, based on the cross-section for flow to Palo Verde Valley described in comment 3. This is much higher than any average that could be obtained using conductivity values in the GWRI. It is therefore reasonable to conclude that overall inflow to the basin is overestimated and that natural discharge is underestimated.
21) If an average of the inflow and outflow estimates is used, the flux through the valley would be an average of 6965 af/y and 750 af/y, as derived above in comments 2, 3, and 20, or about 3850 af/y. Note that this would require a discharge to Palo Verde Valley of 3500 af/y which would require conductivity equal to 14.8 ft/d, still a very high value. Based on this estimate, the project would pump, and consumptively use, about 41% of the natural flux through the basin.
22) Based on the estimate of 3850 af/y as pre-development flux through Chuckwalla Valley, the perennial yield is currently exceeded by the existing pumping near Desert Center and the prison. There is no water available in the Chuckwalla Valley based on the concept of perennial yield for the basin based on the average from comment 21 and the pumping estimates in the GWRI (at Table 3-5).

The summary of the water budget for the valley is as follows. The valley is arid with little in-basin recharge and interbasin flow passing through from upgradient to the Colorado River floodplain. The estimated fluxes that can be considered predevelopment values presented in the GWRI do not balance. The estimated inflow from Pinto/Oracopia Valleys is about three times the estimated ET discharge and interbasin flow to Palo Verde Valley; add any of the in-basin recharge estimates from the GWRI and the natural inflow to the basin far exceeds the natural discharge – a situation that cannot be correct, which demonstrates the GWRI contains errors that were not considered within the document.

Comments 21 and 22 lay out an argument for a perennial yield that is much less than the 12,000 af/y discussed in the GWRI and referenced by the SA. Using an average flux through the valley based on the pre-development estimates of recharge and discharge, the proposed pumping is about 41% of the perennial yield or flux through the basin. Current pumpage exceeds this natural flux by more than two times. Adding the project to the existing demands of 10,475 af/y (GWRI, Table 3-5), more than 12,000 af/y would be removed from the basin annually. This is about 3.1 times a reasonable perennial yield estimate of 3850 af/y.

Groundwater Model

The applicant's groundwater model is insufficient to predict the impacts of this project. It is poorly designed and calibrated. The following comments are specific to its development and use.

23) The authors call the model impact modeling (GWRI, at 44) which means they are only considering drawdown from pumping and not trying to implement the conceptual flow model of the valley. The model considers neither recharge nor discharge. The model does not account for the heterogeneous aquifers in the basin.
24) There is no justification for the number of layers chosen for the model. The model assumes each layer extends continuously over the entire model domain which ignores the heterogeneity present in the basin. Every layer with low conductivity is assumed to provide an unbroken barrier across the entire domain, again without justifying data.
25) The supplemental GWRI also indicates the layers are not continuous. "The general sequence of sediments described above appears substantially similar to other closely logged borings in the eastern Chuckwalla Valley; however, the **depths of specific coarse grained units cannot be widely correlated** based on the available data. Based on this observation and the results of the pumping test of units in the middle Bouse Formation, described below, **coarse grained units in this part of the basin appear to be of relatively limited lateral continuity**" (SGWRI, at 4).
26) If the coarse grained unit are of "limited lateral continuity", as indicated in the quote in the previous bullet, it is absolutely unjustified to model the coarse units as continuous layers, as was done in the model.
27) If the depths of the units cannot be "widely correlated", also as noted in bullet 25, dividing the domain into a dozen layers with valleywide continuity is absolutely unjustified.
28) The geophysical log provided for well OBS-2 does not justify the layering or assigned/calibrated conductivity values at the well, except, possibly the confining clay layer observed 260 to 280 ft bgs. However, the model simulates that clay in layers 3 and 4, which are 39 feet thick (GWRI, at Figure 21), not the 20 feet observed on the log.
29) All layers below the clay, in the model, have horizontal conductivity high enough to yield sufficient water to the proposed well ($Kh \geq 0.1$ ft/d), but the assigned vertical conductivity is very low, leading to a high vertical anisotropy and a tendency for the model to prevent vertical flow.
30) The geophysical log shows substantial poorly graded sand between 360 and 410 ft bgs. This zone should have the highest conductivity, based on gradation, but spans part of layers 7 and 8 with $Kh=3$ ft/d. Deeper layers which show more clay interbedded with the sand have higher conductivity, near 15 ft/d. The proposed pumping would be constructed in these lower layers. The model layers do not match nor are justified by the geophysical log; the high horizontal and low vertical conductivity values for layers that do not correspond with the geophysical log, could limit the drawdown so that most is limited to deeper layers.
31) The model simulates clay in layers 3 and 4. Because of its extremely low vertical conductivity, it controls the drawdown in overlying layers. The model assumes that the clay layer separating the Bouse formation from the overlying alluvium extends over the entire model domain. This assumption is absolutely without justification because the report provides **no supporting data** to show it is

The model calibration was based on a seven-day pump test completed for near the proposed project location. The GWRI presents a substantial amount of sensitivity analysis, which apparently is an attempt to substitute for a decent flow model of the basin and to adequately calibrate/validate it. The following comments demonstrate the problems with the calibration and sensitivity analysis and explain why it is no substitute for an accurate model.

32) The calibration effectively considers groundwater level responses measured during a 7-day pump test at one point in the valley. The **calibration is for essentially a single point** when the model is of a large basin.
33) The calibration pump test pumped at 87 gpm but the project will pump at 1000 gpm. The **pump test does not stress the aquifer sufficiently** to assess how it would perform with pump rates closer to that required for this project.
34) The pump test well was screened between 350 and 550 feet bgs (lithologic log for TW-1 in GWRI App 2), but the proposed pumping well will be screened from 800 to 1800 ft bgs. **Thus, the calibration data available for this project is for pumping an aquifer layer not targeted for pumping for this project**.
35) Fluctuations in the observed data for OBS #2_270 and Transducer #2_315 indicate that **barometric pressure may have affected the values**. The report does not indicate whether barometric pressure adjustments were made. Because the level changes for these wells were less than 1.5 feet, the variability induced by not considering pressure changes could have biased the calibration.
36) The calibration sensitivity analysis (GWRI, at Tables 4-4, 4-5) shows that the results depend on the chosen vertical conductivity in the clay layer. Drawdown in the layer 3 and layer 5 observation wells was roughly 2.5 to 3 times higher for a one order of magnitude increase in clay layer vertical conductivity. Although the absolute values are small, the drawdown in the unconfined well OBS-1 is **36 times greater** for the same increase in clay layer vertical conductivity. **The model depends on the (supposedly) calibrated vertical conductivity to limit drawdown in the unconfined alluvial layer**.
37) The validation model runs using the prison wells (GWRI, at 52) do not prove the model's ability to predict drawdown. **A three-day validation does not compare with a 33-year simulation period**. After just three days, the simulated drawdown varies from observed by from 15 to 25% - this is not reasonably close – based on the sensitivity analyses completed in the GWRI they suggest the transmissivity is off by a factor of 10, at least. The residuals in the validation are that the simulation underestimated the drawdown (GWRI, App 8, figures for WP-38 and -39)

The GWRI presents drawdown estimates for specific locations, a map of drawdown, and predicted changes in boundary flows. Because the model is based on so little data and lots of unwarranted assumptions, there is little confidence in the results. The sensitivity analyses actually demonstrate the lack of confidence in the predictions and the boundary

flows show that the impacts even with the "calibrated" data are significant. The following comments demonstrate the uncertainty in the predictions and the certainty that impacts are significant.

38) The magnitude of boundary flow changes is estimated with the model to be about 20% of the pumping rate after just 33 years (GWRI, Table 4-9). Even if pumping ceases at 33 years, the changes in boundary flow will continue to increase as drawdown recovers. This magnitude of change shows that this project will have a major effect on the water balance of the Chuckwalla Valley and significantly change flows to and from adjoin basins, such as the Palo Verde Valley (the Colorado River floodplain aquifer).
39) The GWRI (at 64) inappropriately calls this decrease in flow to Palo Verde Valley "insignificant" without considering the water budget of that valley. The decrease in flow is about 80% of the predicted 400 af/y flow to Palo Verde Valley (GWRI, at 31). This is most definitely significant. See also the discussion on water budget above.
40) Increasing the vertical conductivity in the clay layers 3-6 tripled the drawdown in the water table aquifer. The magnitude of the changes remains small which demonstrates the importance of the clay layering in the model to the results presented in the GWRI. The assumed clay layer in the model is necessary to "protect" surface aquifers and prevent deep pumping from drawing salty water into the deeper layers.
41) Decreasing the horizontal conductivity in the pumping layer to one tenth the "calibrated" value increased drawdown at the pumping well from about 10 to 70 feet. By itself, this is a huge difference in drawdown. However, this change increased the drawdown in the water table by more than six times, over twice as much as lowering the vertical conductivity, because the increased drawdown at the well increased the gradient drawing flow from the water table layer.
42) The GWRI completely fails to consider the effects of different drawdown by layer because it does not report the changes in flux among layers; because the project seeks to prevent drawing salty near-surface water into the deeper layers, the report should have honestly presented this important aspect of the sensitivity analysis.

An accurate full groundwater model of the project is needed. There appears to be sufficient well and pumping data available in Chuckwalla Valley, and presented in the appendices of the GWRI, to develop a proper groundwater model using justifiable assumptions. Considering the magnitude of the proposed pumping with the flux in the water balance for the valley, a full groundwater model is the only way to estimate the long-term impacts of the project.

Impact on the Colorado River

The Chuckwalla Valley is tributary to the Colorado River, which means that all of the flux from the valley will eventually reach the river. It also means that all of the pumpage will eventually be lost to the Colorado River. This is basic water balance analysis.

However, it will take a long time and the management of the Colorado River is generally based on consideration of more finite time frames.

The GWRI applied Leake et al (2008) and found that the proposed pumping will occur in an area where just 1% of the pumping will be depleted from the Colorado River after 100 years. They are wrong. The one percent value would have been based on the lower transmissivity estimate by Leake et al (2008); this estimate is inaccurate because based on flow and cross-section values discussed in comment 3, the transmissivity is about 15,750 ft^2/d (although through the valley it would be variable). This is between the values used by Leake et al (2008), which suggests the depletion from the Colorado River from the proposed pumping would be between 1 and 10%.

Conclusions

I would like to summarize my conclusions as follows:

Current pumping in Chuckwalla Valley far exceeds the perennial yield, which has been estimated in the past and it the GWRI to be much higher than it should have been estimated. This project would make the pumping in the valley exceed a more reasonable perennial yield estimated by more than three times. The groundwater model used by the applicant is insufficient for analyzing the impacts and is biased, through clay layering in the model, to underestimate the drawdown. All of the water withdrawn for this project will eventually deplete flows in the Colorado River because the only interbasin discharge from Chuckwalla Valley is to Palo Verde Valley, an alluvial valley in significant connection with the Colorado River.

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Declaration of Tom Myers

Re: Impacts to Water Resources from the Proposed Genesis Solar Energy Project

Docket 09-AFC-8

I, Tom Myers, declare as follows:

1) I am currently a Hydrologic Consultant and have held this position for 16 years.

2) My relevant professional qualifications and experience are set forth in the attached resume and the testimony above and are incorporated herein by reference.

3) I prepared the testimony attached hereto and incorporated herein by reference, relating to the impacts of the proposed project on water resources.

4) I prepared the testimony above and incorporated herein by reference relating to the proposed Genesis Solar Energy Project in Riverside County, California.

5) It is my professional opinion that the testimony above is true and accurate with respect to the issues that is addressed.

6) I am personally familiar with the facts and conclusions described within the testimony above and if called as a witness, I could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: ____June 16, 2010_____ Signed: Thomas J Myers

At: ___Reno, NV_____

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Statement of Qualifications

Tom Myers is a researcher and consultant in hydrogeology and water resources. Tom specializes in groundwater modeling, hydrogeology, environmental forensics, regulatory compliance, water rights, NEPA analysis, and environmental and water policy. He focuses on mining and water resource development issues, coal-bed methane development and groundwater contamination.

With a Ph.D. and M.S. in hydrology/hydrogeology and more than 28 years experience as a consultant, government planner, academic researcher, teacher and advocate for environmental responsibility and good science, Tom brings a strong technical, regulatory, and public relations background to his work. His work includes major hydrology studies for federal government, hydrogeologic assessments for county governments, expert and evidence reports for use in litigation and administrative hearings, expert witnessing for private industry and nonprofit groups, and testimony to Congress and National Academy of Science. Tom has testified as an expert before the Nevada State Engineer and State Environmental Commission. He has provided evidentiary testimony before federal court in Billings MT.

Because of his experience as a watchdog of government agencies and different industries, Tom has a unique background from which he draws on as a consultant. For example, he has worked to locate the source of pollution from many mines or to determine the cause of drawdown at private wells. He combines a strong technical background with a working knowledge of state environmental and federal NEPA, BLM mining, water law and Clean Water Act regulations which enables him to work with attorneys and conservation groups.

Tom's experience and training uniquely qualifies him to provide diverse and affordable services to clients ranging from nonprofit conservation groups to law firms, industry and governments in many areas of hydrogeology and environmental and water policy. His client base includes nonprofit conservation groups, Native American tribes, the federal government and private industry.

Client List

NON-PROFIT ORGANIZATIONS	***GOVERNMENTAL ENTITIES***
Natural Resources Defense Council	Pima County, AZ
Great Basin Resource Watch	White Pine County, NV
Greater Yellowstone Coalition	Anaconda-Deer Lodge County, MT
Great Basin Water Network	Town of Indian Springs, NV
Keep Local Water Local	Bureau of Land Management, Carson City, NV
Citizens Looking at Impacts of Mining	University of Nevada, Reno
Defenders of Wildlife	***PRIVATE INDUSTRY***
Northern Plains Resource Council	Yonkee and Toner, LLC, Sheridan WY
McCloud Watershed Council	Public Resource Associates, Reno, NV
	Kuipers and Associates, Butte, MT

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Curriculum Vitae

Objective: To provide diverse research and consulting services to nonprofit, government, legal and industry clients focusing on groundwater modeling, hydrogeology, environmental forensics and compliance, NEPA analysis, federal and state regulatory review, fluvial morphology and environmental and water policy.

Education

Years	Degree	University
1992-96	Ph.D. Hydrology/Hydrogeology	University of Nevada, Reno Dissertation: Stochastic Structure of Rangeland Streams
1990-92		University of Arizona, Tucson AZ Classes in pursuit of Ph.D. in Hydrology.
1988-90	M.S. Hydrology/Hydrogeology	University of Nevada, Reno Thesis: Stream Morphology, Stability and Habitat in Northern Nevada
1981-83		University of Colorado, Denver, CO Graduate level water resources engineering classes.
1977-81	B.S., Civil Engineering	University of Colorado, Boulder, CO

Special Coursework

Years	Course	Sponsor
2009	Fractured Rock Analysis	MidWest Geoscience
2005	Groundwater Sampling Field Course	Nielson Environmental Field School
2004	Environmental Forensics	National Groundwater Association
2004 and -5	Groundwater and Environmental Law	National Groundwater Association
1998	MapInfo GIS Systems	MapInfo Corporation Tutorial
1993	Applied Fluvial Morphology	Wildlands Hydrology
1988	Fortran Programming	University of Nevada, Las Vegas

Professional Experience

Years	Position	Duties
1993-Pr.	Hydrologic Consultant	Surface, groundwater and systems modeling, hydrogeology studies, stream restoration design, watershed modeling studies and expert testimony for industry, nonprofit groups, and government agencies.
1999-2004	Great Basin Mine Watch Executive Director	Responsible for reviewing and commenting on mining projects with a focus on groundwater and surface water resources, preparing appeals and litigation, writing reports about mining, fundraising, organizational development, supervision and personnel management.
1992-1997	University of Nevada, Reno Research Associate	Research on riparian area and watershed management including stream morphology, aquatic habitat, cattle grazing and low-flow and flood hydrology.
1990-1992	University of Arizona, Tucson Research and Teaching Assistant	Research on rainfall/runoff processes and climate models. Taught lab sections for sophomore level "Principles of Hydrology". Received 1992 Outstanding Graduate Teaching Assistant Award in the College of Engineering
1988-1990	University of Nevada, Reno Research Assistant	Research on aquatic habitat, stream morphology and livestock management.
1983-1988	US Bureau of Reclamation, Boulder City, NV Hydraulic Engineer	Performed hydrology planning studies on topics including floodplains, water supply, flood control, salt balance, irrigation efficiencies, sediment transport, stream morphology, flood frequency, rainfall-runoff modeling and groundwater balances.
1981-1983	Faulkner-Kellogg and Assoc., Lakewood Co Design Engineer	Basic drainage, grading and subdivision design. Flood control studies.

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STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the Matter of:	
APPLICATION FOR CERTIFICATION FOR THE GENESIS SOLAR ENERGY PROJECT	DOCKET NO. 09-AFC-8

THE CENTER FOR BIOLOGICAL DIVERSITY

OPENING TESTIMONY

TESTIMONY OF BILL POWERS, P.E.

June 18, 2010

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I. Introduction

My testimony addresses: 1) the inadequate analysis of the distributed photovoltaic (PV) alternative to the proposed Genesis Solar Energy Project (GSEP) in the Revised Staff Analysis (RSA), and 2) the proposed Westlands Water District Competitive Renewable Energy Zone, located on retired farmland in the Central Valley and served by 5,000 MW of existing transmission capacity, as a superior alternative location for central station solar projects like GSEP.

I am a registered professional mechanical engineer in California with over 25 years of experience in the energy and environmental fields. I have permitted five 50 MW peaking turbine installations in California, as well as numerous gas turbine, microturbine, and engine cogeneration plants around the state. I organized conferences on permitting gas turbine power plants (2001) and dry cooling systems for power plants (2002) as chair of the San Diego Chapter of the Air & Waste Management Association. I am the author of the October 2007 strategic energy plan for the San Diego region titled "San Diego Smart Energy 2020." The plan uses the state's Energy Action Plan as the framework for accelerated introduction of local renewable and cogeneration distributed resources to reduce greenhouse gas emissions from power generation in the San Diego region by 50 percent by 2020. I am the author of several 2009 articles in Natural Gas & Electricity Journal on use of large-scale distributed solar PV in urban areas as a cost-effective substitute for new gas turbine peaking capacity.

II. Rooftop PV Is at the Top of the Energy Action Plan Loading Order

The RSA states, in discussing the conservation and demand-side management alternative to GSEP, that cost-effective energy efficiency is the resource of first choice in meeting California's energy needs (p. B.2-84):

> "Conservation and demand-side management consist of a variety of approaches to reduce of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. In 2005 the Energy Commission and CPUC's Energy Action Plan II declared cost effective energy efficiency as the resource of first choice for meeting California's energy needs."

The CEC and the CPUC developed the "Energy Action Plan" in 2003 to guide strategic energy decisionmaking in California. The Energy Action Plan establishes the energy resource "loading order," or priority list that defines how California's energy needs are to be met. Energy Action Plan I was published in May 2003.[1] Energy Action Plan I describes the loading order in the following manner (p. 4):

> "The Action Plan envisions a "loading order" of energy resources that will guide decisions made by the agencies jointly and singly. First, the agencies want to optimize all strategies for increasing conservation and energy efficiency to minimize increases in electricity and natural gas demand. Second, recognizing that new generation is both necessary and desirable, the agencies would like to see these needs met first by renewable energy resources and distributed generation. Third, because the preferred resources require both sufficient investment and adequate

[1] Energy Action Plan I: http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF

time to "get to scale," the agencies also will support additional clean, fossil fuel, central-station generation. Simultaneously, the agencies intend to improve the bulk electricity transmission grid and distribution facility infrastructure to support growing demand centers and the interconnection of new generation."

Energy Action Plan I, Under "Optimize Energy Conservation and Resource Efficiency," states (p. 5):

> "Incorporate distributed generation or renewable technologies into energy efficiency standards for new building construction."

Energy Action Plan I identifies rooftop PV as a de facto energy efficiency measure with this statement. As noted in the GSEP RSA (p. B.2-84), energy efficiency is at the top of the loading order. Energy Action Plan I also states, Under "Promote Customer and Utility-Owned Distributed Generation," (p. 7):

> "Distributed generation is an important local resource that can enhance reliability and provide high quality power, without compromising environmental quality. The state is promoting and encouraging clean and renewable customer and utility owned distributed generation as a key component of its energy system. Clean distributed generation should enhance the state's environmental goals. This determined and aggressive commitment to efficient, clean and renewable energy resources will provide vision and leadership to others seeking to enhance environmental quality and moderate energy sector impacts on climate change. Such resources, by their characteristics, are virtually guaranteed to serve California load. With proper inducements distributed generation will become economic.
>
> - Promote clean, small generation resources located at load centers.
> - Determine system benefits of distributed generation and related costs.
> - Develop standards so that renewable distributed generation may participate in the Renewable Portfolio Standard program."

Energy Action Plan I prioritizes rooftop PV as the preferable renewable resource, but indicates obliquely that it is costly and that in any case distributed PV is not eligible to participate in the Renewable Portfolio Standard (RPS) program. Therefore investor-owned utilities have no incentive to develop distributed PV resources. Since Energy Action Plan I was approved in 2003, PV cost has dropped dramatically. Commercial distributed PV is half the cost it was in 2003 and costs continue to drop. Residential PV is following quickly behind. Distributed PV is also now eligible for the RPS program.[2]

Energy Action Plan II was adopted in September 2005.[3] The purpose of Energy Action Plan II is stated as (p. 1): "EAP II is intended to look forward to the actions needed in California over the next few years, and to refine and strengthen the foundation prepared by EAP I." Energy Action Plan II reaffirms the loading order stating (p. 2):

> "EAP II continues the strong support for the loading order – endorsed by Governor

[2] CPUC Press Release – Docket A.08-03-015, *CPUC Approves Edison Solar Roof Program*, June 18, 2009. "The energy generated from the project will be used to serve Edison's retail customers and the output from these facilities will be counted towards Edison's RPS goals."

[3] Energy Action Plan II: http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF

Schwarzenegger – that describes the priority sequence for actions to address increasing energy needs. The loading order identifies energy efficiency and demand response as the State's preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, we rely on renewable sources of power and distributed generation, such as combined heat and power applications. To the extent efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, we support clean and efficient fossil-fired generation."

The CEC's *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report* (December 2009), underscores the integration of building PV as a critical component of "net zero" energy use targets for new residential and commercial construction, under the heading "Energy Efficiency and the Environment," explaining:[4]

> "With the focus on reducing GHG emissions in the electricity sector, energy efficiency takes center stage as a zero emissions strategy. One of the primary strategies to reduce GHG emissions through energy efficiency is the concept of zero net energy buildings. In the 2007 IEPR, the Energy Commission recommended increasing the efficiency standards for buildings so that, when combined with on-site generation, newly constructed buildings could be zero net energy by 2020 for residences and by 2030 for commercial buildings.
>
> A zero net energy building merges highly energy efficient building construction and state-of-the-art appliances and lighting systems to reduce a building's load and peak requirements and includes on-site renewable energy such as solar PV to meet remaining energy needs. The result is a grid-connected building that draws energy from, and feeds surplus energy to, the grid. The goal is for the building to use net zero energy over the year."

The GSEP RSA acknowledges the state's commitment to net zero residential and commercial buildings, stating (RSA, p. B.2-84):

> "The CPUC, with support from the Governor's Office, the Energy Commission, and the California Air Resources Board, among others, adopted the California Long-Term Energy Efficiency Strategy Plan for 2009 to 2020 in September 2008 (CPUC 2008). The plan is a framework for all sectors in California including industry, agriculture, large and small businesses, and households. Major goals of the plan include:
>
> - All new residential construction will be zero net energy by 2020;
> - All new commercial construction will be zero net energy by 2030;
> - Heating, ventilation, and air conditioning industries will be re-shaped to deliver maximum performance systems;
> - Eligible low-income customers will be able to participate in the Low Income Energy Efficiency program and will be provided with cost-effective energy efficiency measures in their residences by 2020."

The RSA is flawed in its failure to identify rooftop PV as a higher priority in the Energy Action Plan loading order, and California's long-term energy efficiency strategy plan, than utility-scale remote solar resources like GSEP. Rooftop (or parking lot) distributed PV is an integral component of the long-term energy efficiency strategy plan adopted by the CPUC in 2008.

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[4] CEC, *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report*, December 2009, p. 56.

Energy Action Plan II declares cost-effective energy efficiency as the resource of first choice for meeting California's energy needs. The CEC rejection of distributed PV as a superior alternative to the proposed GSEP solar thermal projects ignores the integral role of distributed PV in the CEC's own definition of energy efficiency and net zero buildings in the 2009 IEPR.

III. RSA Rationale for Eliminating Rooftop PV is Flawed

The RSA correctly describes that a distributed rooftop PV alternative has essentially no environmental impact, stating (p. B.2-68):

- Distributed solar PV is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required and there would be few associated biological impacts.
- Relatively minimal maintenance and washing of the solar panels would be required.
- Because most PV panels are black to absorb sun, rather than mirrored to reflect it, glare would be minimal relative to reflective technologies (like GSEP)
- Additionally, the distributed solar PV alternative would not require the additional operational components, such as dry-cooling towers, substations, transmission interconnection, maintenance and operation facilities with corresponding visual impacts.

The RSA then eliminates distributed PV, citing a number of reasons why achieving 250 MW of distributed PV is not a feasible substitute for GSEP (RSA, p. B.2-69):

- Would require accelerated deployment of distributed PV at more than double the historic rate of deployment under the California Solar Initiative.
- Would require lower PV cost - distributed PV is higher cost than central station solar thermal.
- Integrating large amounts of distributed PV on distribution systems throughout California presents challenges – will require development of a new transparent distribution planning framework.

Each of these justifications for elimination of distributed PV is flawed, as explained in the following paragraphs.

A. Distributed PV Is Already Being Deployed at a Much Faster Rate in California than Central Station Solar Thermal

The RSA notes that more than 540 MW of distributed PV was in operation in California through May 2009, and that the PV installation rate doubled between 2008 and 2007. California has approximately 360 MW of installed solar thermal capacity as of June 2010. With the exception of the 5 MW eSolar power tower demonstration project that came online in 2009 (p. B.2-68), all of this solar thermal capacity was installed between 1984 and 1990.[5]

[5] CEC, Large Solar Energy Projects webpage: http://www.energy.ca.gov/siting/solar/index.html

The RSA correctly describes that both SCE and PG&E, the two largest investor-owned utilities (IOU) in California, are constructing large distributed PV projects (p. B.2-67). SDG&E has a much smaller distributed PV project in development. The 500 MW SCE urban PV project was approved by the CPUC in June 2009. The 500 MW PG&E distributed PV project was approved by the CPUC in April 2010. These projects are RPS-eligible and will consist of a 250 MW IOU-owned component and a 250 MW third-party component. The power purchase agreement (PPA) between GSEP and SDG&E is same type of contract mechanism that will be used by SCE and PG&E to contract for the 250 MW third-party component of their respective distributed PV projects.

Progress in distributed PV installation rates under the California Solar Initiative (CSI) program provides no insight into the ability of the solar industry to carry-out multiple large-scale distributed PV projects simultaneously, in the range of 250 to 500 MW each, in California. The CSI program is not the vehicle that will be used to build these projects. These projects will be built under long-term PPAs between the distributed PV project developer and a utility within the framework of the RPS program.

An example is the PPA between PG&E and Sempra Generation for 10 MW of fixed thin-film PV in Nevada.[6] Sempra Resources is the holding company that owns both Sempra Generation and SDG&E. The PG&E/Sempra PPA is a technology-differentiated renewable energy contract at a price incrementally higher than the market price referent (MPR) to assure that the project developer, Sempra Generation, makes a reasonable return on its investment. The contract is in effect the equivalent of a technology differentiated feed-in tariff for solar power. No incentives beyond the federal investment tax credit and accelerated depreciation available to any solar energy project were necessary. No incentives beyond those already available would be necessary to build 250 MW of distributed PV under a long-term PPA to substitute for GSEP.

Sempra Generation touts the cost of power generated by its 10 MW PV installation in Nevada as "the lowest cost solar energy in the world."[7] The company specifically mentions solar thermal projects like GSEP as producing higher-cost solar energy and being commercially unproven, stating:[8]

> "Sempra has also evaluated solar thermal power technologies, which use a field of mirrors to concentrate the sunlight to produce heat for electricity generation. The company has found that using solar panels is the cheaper option, (CEO) Allman said. He noted that some of the solar thermal power technologies, such as the use of a central tower for harvesting the heat and generating steam, have yet to be proven commercially."

SCE has a similar RPS-eligible PPA with NRG for the output of a 21 MW fixed thin-film PV array in Blythe, California.[9] This project began operation in December.

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[6] CPUC Resolution E-4240, *Approval of a power purchase agreement (PPA) for generation from a new solar photovoltaic facility between PG&E and El Dorado Energy*, LLC (Sempra Generation), May 18, 2009.

[7] GreenTech Media, *Sempra Wants 300 MW Plus of Solar in Arizona*, April 22, 2009. "The electricity we are getting out of the 10-megawatt is the lowest cost solar energy ever generated from anywhere in the world." (CEO Michael Allman).

[8] Ibid.

[9] First Solar press release, *First Solar Sells California Solar Power Project to NRG*, November 23, 2009.

B. IOUs and California's Energy Policy Makers Acknowledge the Obvious Benefits of Large-Scale Distributed PV Projects as a Direct Complement/Substitute for Remote Central Station Renewable Energy and Associated Transmission

SCE expressed confidence in its March 2008 application to the CPUC for a 250 to 500 MW urban PV project that it can absorb thousands of MW of distributed PV without additional distribution substation infrastructure, stating "SCE's Solar PV Program is targeted at the vast untapped resource of commercial and industrial rooftop space in SCE's service territory"[10] and "SCE has identified numerous potential (rooftop) leasing partners whose portfolios contain several times the amount of roof space needed for even the 500 MW program."[11]

SCE stated it has the ability to balance loads at the distribution substation level to avoid having to add additional distribution infrastructure to handle this large influx of distributed PV power.[12] SCE explains:

> "SCE can coordinate the Solar PV Program with customer demand shifting using existing SCE demand reduction programs on the same circuit. This will create more fully utilized distribution circuit assets. Without such coordination, much more distribution equipment may be needed to increase solar PV deployment. SCE is uniquely situated to combine solar PV Program generation, customer demand programs, and advanced distribution circuit design and operation into one unified system. This is more cost-effective than separate and uncoordinated deployment of each element on separate circuits."[13]

SCE also notes that it will be able to remotely control the output from individual PV arrays to prevent overloading distribution substations or affecting grid reliability:[14]

> "The inverter can be configured with custom software to be remotely controlled. This would allow SCE to change the system output based on circuit loads or weather conditions."

As SCE states, "Because these installations will interconnect at the distribution level, they can be brought on line relatively quickly without the need to plan, permit, and construct the transmission lines."[15] This statement was repeated and expanded in the CPUC's June 18, 2009 press release regarding its approval of the 500 MW SCE urban PV project:[16]

> Added Commissioner John A. Bohn, author of the decision, "This decision is a major step forward in diversifying the mix of renewable resources in California and spurring the development of a new market niche for large scale rooftop solar applications. Unlike other generation resources, these projects can get built quickly and without the need for expensive new transmission lines. And since they are built on existing structures, these projects are extremely benign from an environmental standpoint, with neither land use, water, or air emission impacts. By authorizing both utility-owned and private development of these projects we hope to get the best from both types of ownership structures, promoting competition as well as fostering the rapid development of this nascent market."

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[10] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Application*, March 27, 2008, p. 6.
[11] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Testimony*, March 27, 2008, p. 44.
[12] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Application*, March 27, 2008, pp. 8-9.
[13] Ibid, p. 9.
[14] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Testimony*, March 27, 2008, p. 27.
[15] Ibid, p. 6.
[16] CPUC Press Release – Docket A.08-03-015, *CPUC Approves Edison Solar Roof Program*, June 18, 2009.

The CPUC made a similar observation with its approval of the PG&E 500 MW distributed PV project in April 2010:[17]

> "This solar development program has many benefits and can help the state meet its aggressive renewable power goals," said CPUC President Michael R. Peevey. "Smaller scale projects can avoid many of the pitfalls that have plagued larger renewable projects in California, including permitting and transmission challenges. Because of this, programs targeting these resources can serve as a valuable complement to the existing Renewables Portfolio Standard program."

The use of the term "smaller scale" in the CPUC press release is a misnomer. Clearly a 500 MW distributed PV project is larger-scale than the 250 MW GSEP solar thermal project. Individual rooftop PV arrays in a large distributed PV project are functionally equivalent to single rows of reflective mirrors in a solar thermal project. Each rooftop or row is a small contributor to a much bigger whole.

C. IOUs Need Only Provide a Basic Level of Existing Information on Individual IOU Substation Capacities to PV Developers to Interconnect Over 13,000 MW of Distributed PV with Minimal Interconnection Cost

The CPUC has also calculated, for the entire inventory of approximately 1,700 existing IOU substations, the amount of distributed PV that could be accommodated with minimal interconnection cost based on the following reasoning:[18]

> "Rule 21 specifies maximum generator size relative to the peak load on the load at the point of interconnection at 15%. So, for example, if a generator is interconnected on the low side of a distribution substation bank with a peak load of 20 MW, the maximum Rule 21 interconnection criteria would allow a 3 MW system (3 MW = 15% * 20 MW).
>
> However, the 15% criterion, which is established for all generators regardless of type, was adjusted to 30% for the purposes of determining the technical potential of PV. The 15% limit is established at a level where it is unlikely the generator would have a greater output than the load at the line segment, even in the lowest load hours in the off-peak hours and seasons (such as the middle of the night and in the spring). Since the peak output for photovoltaics is during the middle of the day, PV is unlikely to have any output when loads are lowest. Therefore, a 30% criterion was used for technical interconnection potential estimates. The discussion was held with utility distribution engineers, however, we did not consider formal engineering studies or Rule 21 committee deliberation since the purpose of the analysis was only to define potential."

As a component of the DG FIT development process, the CPUC requested data on peak loads at all IOU substations from the IOUs and compiled that information graphically as shown in Figure

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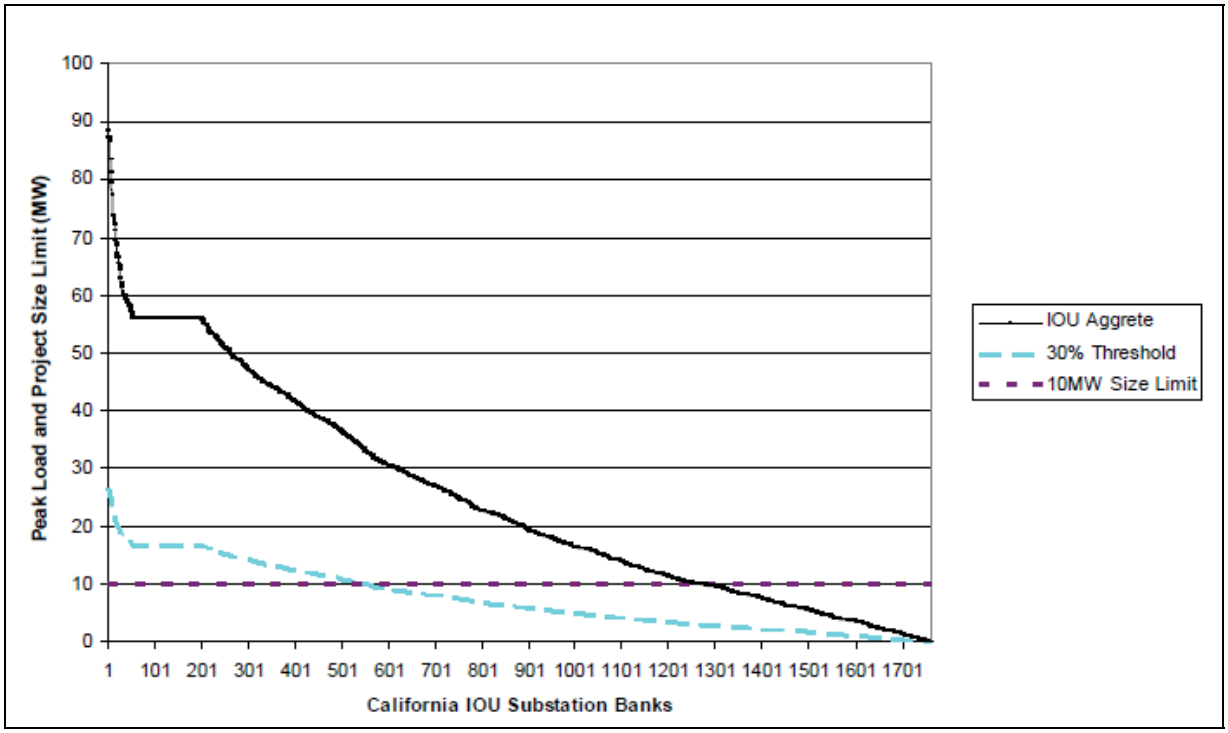
[17] CPUC Press Release – Docket A.09-02-019, *CPUC Approves Solar PV Program for PG&E*, April 22, 2010.
[18] CPUC Rulemaking R.08-08-009 – California RPS Program, Administrative Law Judge's Ruling on Additional Commission Consideration of a Feed-In Tariff, *Attachment A - Energy Division FIT Staff Proposal*, March 27, 2009, p. 15.

1. According to the CPUC, this data was obtained from IOU distribution engineers.[19] I calculate that approximately 13,300 MW of PV can be connected directly to IOU substation load banks based on the data in Figure 1. The supporting calculations for this estimate are provided in Table 1.

The IOUs provide about two-thirds of electric power supplied in California, with publicly-owned utilities like the Los Angeles Department of Water & Power and the Sacramento Municipal Utility District and others providing the rest.[20] Assuming the substation capacity pattern in Figure 1 is also representative of the non-IOU substations, the total California-wide PV that could be interconnected at substation low-side load banks with no substantive substation upgrades would be [13,300/(2/3)] = 19,950 MW.

Figure 1. IOU Substation peak loads, 30% of peak load, and 10 MW reference line



[19] CPUC Rulemaking R.08-08-009 – California RPS Program, Administrative Law Judge's Ruling on Additional Commission Consideration of a Feed-In Tariff, *Attachment A - Energy Division FIT Staff Proposal*, March 27, 2009, pp. 15-16.
[20] CEC, *2007 Integrated Energy Policy Report*, December 2007, Figure 1-11, p. 27.

Table 1. Calculation of distributed PV interconnection capacity to existing IOU substations with minimal interconnection cost from data in Figure 1

Substation range	Number of substations	Calculation of distributed PV that could be interconnected with minimal substation upgrades (MW)	Total distributed PV potential (MW)
1-200	200	average peak ~60 MW x 0.30 = 18 MW	3,600
201-500	300	average peak ~45 MW x 0.30 = 13.5 MW	4,000
501-800	300	average peak ~30 MW x 0.30 = 9 MW	2,700
801-1,000	200	average peak ~20 MW x 0.30 = 6 MW	1,200
1,001-1,600	600	average peak ~10 MW x 0.30 = 3 MW	1,800
		Distributed PV total:	13,300

In sum, approximately 20,000 MW of distributed PV interconnection capacity is available now in California that would require little or no substation upgrading to accommodate the PV.

D. Cost to Upgrade Existing Distribution Substations and Associated Distribution Feeders to Maximize Distributed PV Deployment is Minimal

An upgrade at the substation would be necessary to accommodate the higher power flows in cases where distributed PV, concentrated on clusters of large rooftops, could provide up to 100 percent of a single substation's peak load. A typical 12 kV/69 kV substation can be upgraded to allow two-way (bidirectional) power flows for up to 100 MW of interconnected distributed PV. SDG&E estimates the cost to build a new 12 kV/69 kV substation is $25 million.[21]

The upgrades necessary to allow problem-free bidirectional power flow across an existing substation is far less than the cost of a new substation. The upgrade would consist of retrofitting substation metering and protective equipment from one-way power flow to bidirectional power flow. The cost of such an upgrade for a typical 100 MW distribution substation would be approximately $500,000.[22] This is well under 1 percent of the gross capital cost of 100 MW of state-of-the-art PV at 2010 prices.

Even the cost of a new 100 MW distribution substation, at $25 million, is less than 10 percent of the gross capital cost of 100 MW of state-of-the-art PV at 2010 prices. The substation upgrade cost would be relatively minor compared to the gross capital cost of 100 MW of PV arrays, and would not present a substantive financial hurdle to developing a 100 MW distributed PV resource concentrated in an area served by a single existing substation.

The 2007 IEPR makes clear that incorporating bidirectional capability into distribution substation is a commonsense need in a smart grid environment where higher-and-higher levels of distributed generation are encouraged and expected:[23]

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[21] Ibid, p. 5.21.

[22] E-mail from M. Martyak, PowerSecure (www.powersecure.com), to B. Powers, Powers Engineering, January 13, 2010. Approximate cost to upgrade older 100 MW distribution substation to full bidirectional flow, assuming four 25 MW load banks with four circuit breakers each (16 total), would be $400,000 to $450,000.

[23] CEC, *2007 Integrated Energy Policy Report*, December 2007, pp. 155-156.

> "Utilities spend approximately three-fourths of their total capital budgets on distribution assets, with about two-thirds spent on upgrades and new infrastructure in most years. These investments will remain for 20 to 30 or more years. As utilities throughout the state plan to build new distribution assets and replace old assets, the magnitude of these investments suggests that the state must understand what it is investing in and whether these investments will result in a distribution system that will serve customers in the future. Planning for investment in these assets should include requiring utilities, before undertaking investments in non-advanced grid technologies, to demonstrate that alternative investments in advanced grid technologies that will support grid flexibility have been considered, including from a standpoint of cost effectiveness."

The CPUC assumes that larger PV arrays will be connected directly to the substation low-side (12 kV) load bank. SDG&E estimated that the cost of a 10 MW feeder is $0.6 million per mile.[24] The cost of a 3-mile long dedicated feeder from multiple rooftop PV arrays with a combined capacity of 10 MW to the low-side bus of the substation would be less than $2 million based on SDG&E's cost estimate.

The current capital cost for state-of-the-art commercial rooftop PV is approximately $3,700/kW$_{ac}$. The gross capital cost of 10 MW of rooftop PV at current prices would be $3,700/kW x (1,000 kW/MW) x 10 MW = $37 million. The cost to construct a dedicated feeder to interconnect 10 MW of rooftop PV would be approximately 5 percent of the gross project capital cost. This is a relatively minor cost and represents no financial impediment to developing urban rooftop PV resources.

E. There Is No Security Justification for IOU's Withholding Information on Substation Capacities and Locations from Private PV Developers, and No Economic or Technical Justification for Failure to Incorporate Smart Grid Features in New and Upgraded Distribution Substations

The RSA notes that accommodating large quantities of distributed generation PV located at customer sites efficiently and cost-effectively will require the development of a new, transparent distribution planning framework (p. B.2-70). Transparent distribution planning by the IOUs is a reasonable expectation. Lack of transparent distribution planning is not a credible justification by an IOU or the CEC to reject distributed PV as a substitute for GSEP.

The CEC is already on record advocating that IOUs must incorporate smart grid elements, including bidirectional power flow, into new and upgraded distribution substations.[25] It would likely come as a surprise to most California ratepayers that it is not already standard practice for California IOUs to incorporate bidirectional power flow capability into any new distribution substation or major upgrade of an existing substation. As noted, approximately 20,000 MW of distributed PV can flow into California distribution substations without retrofitting these substations for bidirectional power flow. The lack of bidirectional power flow capability on

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[24] Application No. 06-08-010, Matter of the Application of San DiegoGas & Electric Company (U-902-E) for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, *Chapter 5: Prepared Rebuttal Testimony of SDG&E in Response to Phase 2 Testimony of Powers Engineering*, March 28, 2008, p. 5.20.

[25] CEC, *2007 Integrated Energy Policy Report*, December 2007, pp. 155-156.

California distribution substations is not a short- or mid-term impediment to maximizing distributed PV deployment.

However, at some point over the operational lifetime of a new or upgraded distribution substation it is prudent to assume that failure to equip the substation to accommodate bidirectional power flow will act as an artificial brake on the quantity of distributed PV the substation can accept. Equipping a distribution substation for bidirectional power flow is not expensive, costing in the range of $500,000 for a typical 100 MW distribution substation. Failure of IOUs to incorporate smart grid features as standard elements in new and upgraded distribution substations is not a credible justification by an IOU or the CEC to reject distributed PV as a substitute for GSEP.

The rationale put forth for restricting information to private distributed PV project developers includes "Providing details on distribution system could compromise homeland security" and "Information on peak loads and system configuration may be considered commercially sensitive."[26] There is no sound basis for these two justifications.

In the first instance, climate change is seen as a major threat to national security by the U.S. defense establishment.[27] Withholding information that would allow rapid progress on addressing climate change on homeland security grounds is contrary to the national security interest. Secondly, all IOU expenditures are passed on to customers. The withholding of information on peak loads and system configuration by the IOU to protect unsubstantiated commercial sensitivity concerns, to the extent it prevents the rapid deployment of competitively-bid distributed PV in urban centers at or near the point-of-use, would have a potentially substantial negative impact on ratepayers and slow progress on addressing climate change.

Much of the necessary information is already in the public domain in some form and should be compiled and made available to distributed PV developers in a transparent and efficient format. For example, the CPUC already has the data on IOU substation interconnection limitations as shown in Figure 1. Another example is information on the location of IOU substations. Maps showing the location of all IOU substations are readily available for purchase from the CEC Cartography Unit.

The province of Ontario (Canada) makes publicly-available information on substation location and available capacity to facilitate the development of distributed PV in the province.[28] This same information protocol should be followed by California IOUs.

Finally, SCE must provide this type of information to third-party PV developers for the 250 MW private PV developer set-aside component of its 500 MW urban PV project approved by the CPUC in June 2009.

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[26] E3 and Black & Veatch, *Straw proposal of solution to address short-term problem of information gap*, presentation at CPUC Re-DEC Working Group Meeting, December 9, 2009, p. 9. Online at: http://www.cpuc.ca.gov/PUC/energy/Renewables/Re-DEC.htm

[27] New York Times, *Climate Change Seen as Threat to U.S. Security*, August 9, 2009.

[28] E3 and Black & Veatch, *Straw proposal of solution to address short-term problem of information gap*, presentation at CPUC Re-DEC Working Group Meeting, December 9, 2009, p. 8.

F. There is Sufficient Existing Large Commercial Roof Space in PG&E and SCE Territories to Build at Least Thirty GSEP Plants

The 2009 IEPR Final Committee Report recognizes the huge technical potential of rooftop distributed PV to meet California's renewable energy targets, stating:[29]

> "Recent studies indicate substantial technical potential for distribution-level generation resources located at or near load. A 2007 estimate from the Energy Commission suggests that there is roof space for over 60,000 MW of PV capacity, although the study did not factor in roof space that is shaded or being used for another purpose."

60,000 MW is approximately the peak summertime load for all of California, and 250 times the 250 MW capacity of GSEP. It is important to note that the 2009 IEPR document is incorrect in asserting the 2007 rooftop PV estimate did not factor in roof shading or other limitations. The 60,000 MW estimate assumes only 24 percent of the rooftop of a typical tilt-roof residential rooftop is available for PV, and only 60 to 65 percent of flat-roof commercial rooftops are available for PV. The rationale for these estimates is explained in the 2007 (Navigant) estimate.[30]

The 60,000 MW rooftop PV estimate by Navigant does not account for any of the distributed PV described in the Renewable Energy Transmission Initiative (RETI) process. RETI is California's ongoing renewable energy transmission siting process. RETI evaluated a distributed PV alternative that would produce 27,500 MWac from 20 MW increments of ground-mounted PV arrays at 1,375 non-urban substations around the state.[31] This is similar to the approach that PG&E is following. Constructing distributed PV arrays around substations is the primary focus of PG&E's 500 MW distributed PV project.[32]

Black & Veatch is the engineering contractor preparing the RETI reports. Energy & Environmental Economics, Inc. (E3) is the engineering contractor that prepared the June 2009 CPUC preliminary analysis of the cost to reach 33 percent renewable energy by 2020. These two firms now lead the CPUC's renewable distributed generation ("Re-DEC") working group process. The presentation of E3 and Black & Veatch at the December 9, 2009 initial meeting of the Re-DEC Working Group included an estimate of over 8,000 MWac of large commercial roof space in SCE and PG&E service territories in close proximity to existing distribution substations.[33]

Black & Veatch used GIS to identify large roofs in California and count available large roof area. The criteria used to select rooftops included:

- Urban areas with little available land
- Flat roofs larger than ~1/3 acre
- Assume 65 percent usable space on roof

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[29] CEC, *2009 Integrated Energy Policy Report (IEPR) – Final Committee Report*, December 2009, p. 193.
[30] See: http://www.energy.ca.gov/2007publications/CEC-500-2007-048/CEC-500-2007-048.PDF
[31] Renewable Energy Transmission Initiative, *RETI Phase 1B Final Report*, January 2009, p. 6-25.
[32] PG&E Application A.09-02-019, *Application of Pacific Gas and Electric Company to Implement Its Photovoltaic Program*, February 24, 2009.
[33] E3 and Black & Veatch, *Summary of PV Potential Assessment in RETI and the 33% Implementation Analysis*, presentation at Re-DEC Working Group Meeting, December 9, 2009, p. 24. Online at: http://www.cpuc.ca.gov/PUC/energy/Renewables/Re-DEC.htm

- Within 3 miles of distribution substation

The Black & Veatch estimate for PG&E territory is 2,922 MWac. The estimate for SCE territory is 5,243 MWac. This is a combined rooftop PV capacity of over 8,000 MWac. The combined large commercial rooftop capacity is more than 30 times the 250 MW capacity of GSEP.

Large commercial rooftop PV capacity is a subset of the universe of all commercial rooftop capacity, which includes medium and small commercial rooftops as well. A 2004 Navigant study prepared for the Energy Foundation estimated the 2010 commercial rooftop PV capacity in California at approximately 37,000 MWdc.[34] There is a tremendous amount of commercial roof space available for PV.

G. There is Sufficient Existing Commercial Roof Space in SDG&E Territory to Build at Least Six GSEP Plants

The RSA states that the output from GSEP will be sold to SDG&E under a long-term power purchase agreement if the project is built (p. B.2-41). SDG&E was co-author of a 2005 renewable energy potential assessment for San Diego County that includes a detailed inventory of rooftop PV potential.[35] The core of this inventory is an estimate of 769 MWac of commercial building PV potential in the City of San Diego based direct quantification of available roofspace on 15,157 commercial buildings using GIS analysis. This inventory was extrapolated to other cities in San Diego County, based on population, to calculate an estimated County-wide commercial building PV potential of 1,624 MWac in 2010. The analysis assumed a very conservative dc-to-ac conversion factor of 0.67. Use of a more realistic 0.80 dc-to-ac conversion factor results in a San Diego County adjusted 2010 commercial rooftop PV potential of 1,624 MWac × (0.80/0.67) = 1,939 MWac.

Commercial building rooftops are classified as Category 1 and Category 2 in the 2005 rooftop inventory. Category 1 means 80 percent or more of the rooftop is available for PV. See photographs of Category 1 and Category 2 commercial rooftops in Figure 2. Approximately eighty (80) percent of the commercial building PV potential in San Diego County is classified as Category 1.[36] This means there is over 1,500 MWac of PV potential on Category 1 commercial rooftops in San Diego County, sufficient for the equivalent capacity of six 250 MW GSEP projects.

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[34] Navigant, *PV Grid Connected Market Potential under a Cost Breakthrough Scenario*, prepared for The Energy Foundation, September 2004, p. 83. California commercial rooftop PV potential estimated at approximately 37,000 MWp.
[35] San Diego Regional Renewable Energy Study Group, *Potential for Renewable Energy in the San Diego Region*, Chapter 2: Solar Photovoltaic Electric, August 2005.
[36] Ibid, Table 2-9, p. 11.

Figure 2. Aerial photos of Category 1 and 2 commercial rooftops

H. RSA Uses Outdated PV Cost Assumption to Erroneously Assert GSEP is Lower Cost than Equivalent Distributed PV Capacity

There is no justification for the RSA using an obsolete cost assumption to eliminate large-scale distributed PV as an alternative to the GSEP. The RSA relies on the June 2009 CPUC *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results* assertion that the cost of a high distributed PV case is significantly higher than the other 33 percent RPS alternative cases (p. B2-69). The 33 percent reference case includes 10,000 MW of remote central station solar plants like GSEP. The assertion that the high distributed generation case is significantly higher cost than the reference case was incorrect in June 2009 and is definitively obsolete in June 2010.

The CPUC erroneously assumed a distributed PV cost of over $7/Wac in its June 2009 analysis. However, the CPUC also analyzed a sensitivity case with the capital cost of fixed thin-film PV at $3.70/Wac. The CPUC determined that at $3.70/Wac, the cost of the 33 percent standard remote case and the high DG alternative are similar. RETI has confirmed that the PV pricing cited by the CPUC in its sensitivity analysis is commercially available and not a projection, stating,"Thin film solar PV was previously treated as a sensitivity study, but due to falling costs and the increased prevalence of thin film, it is now being considered as one of the available commercial technologies in addition to tracking crystalline PV." [37]

Accurate PV pricing data has been available from the SCE urban solar PV application for over two years. SCE provided an installed cost of $3.50/Wdc (~$4/Wac) in its March 2008 application to the CPUC to build a 250 MW urban PV project. RETI states that the commercially

[37] RETI, *Phase 2B Final Report*, May 2010, p. 4-6.

available thin-film PV has a capital cost range of $3.60 to $4/Wac, and commercially available single-axis tracking polysilicon PV has a cost range of $4 to $5/Wac.[38]

These PV costs compare to a capital cost range for solar thermal, assumed to be dry-cooled, of $5.35 to $5.55/Wac. RETI indicates the capacity factor for thin-film PV is essentially the same as for dry-cooled solar thermal (assuming the same location). The capacity factor for single-axis tracking polysilicon PV is significantly better than that of dry-cooled solar thermal (assuming the same location). Operations and maintenance cost for either fixed thin-film PV or single-axis tracking polysilicon PV is lower than for dry-cooled solar thermal. This RETI data is summarized in Table 2 below.

Table 2. RETI capital cost, capacity factor, and O&M cost – dry-cooled solar thermal, fixed thin-film PV, and single-axis tracking polysilicon PV

Solar Technology	Capital Cost ($/kWac)	Capacity Factor (%)	O&M Cost ($/MWh)
Dry-cooled solar thermal	5,350 – 5,550	20 – 28	30
Fixed thin-film PV	3,600 – 4,000	20 - 27	20 - 27
Single-axis tracking polysilicon PV	4,000 – 5,000	23 - 31	17 - 25

The RSA comment on the capacity factors of solar thermal and rooftop PV is out-of-date (p. B.2-67): "The Renewable Energy Transmission Initiative (RETI) assumed a capacity factor of approximately 30 percent for solar thermal technologies and tracking solar PV and approximately 20 percent capacity factor for rooftop solar PV which is assumed to be non-tracking, for viable solar generation project locations (B&V 2008; CEC 2009)." As shown in Table 2, the RETI capacity factors of solar thermal and fixed (rooftop) solar PV are essentially the same assuming the same location.

The effect of the values in Table 2 on the levelized cost-of-energy (COE) for dry-cooled solar thermal, fixed thin-film PV, and single-axis tracking polysilicon PV is shown in Table 3.[39] The average levelized COE for either fixed thin-film PV or single-axis tracking polysilicon PV is significantly lower than the levelized COE of dry-cooled solar thermal plants.

Table 3. RETI cost-of energy (COE) comparison - dry-cooled solar thermal, fixed thin-film PV, and single-axis tracking polysilicon PV

Solar Technology	Levelized COE ($/MWh)
Dry-cooled solar thermal	$195 – 226 (mean: $210)
Fixed thin-film PV	$135 – 214 (mean: $175)
Single-axis tracking polysilicon PV	$138 – 206 (mean: $172)

The CPUC determined that there would be little difference in the cost of meeting state renewable energy targets by relying predominantly on distributed PV, when current state-of-the-art pricing is assumed, instead of building 10,000 MW of remote solar capacity under the 33 percent RPS

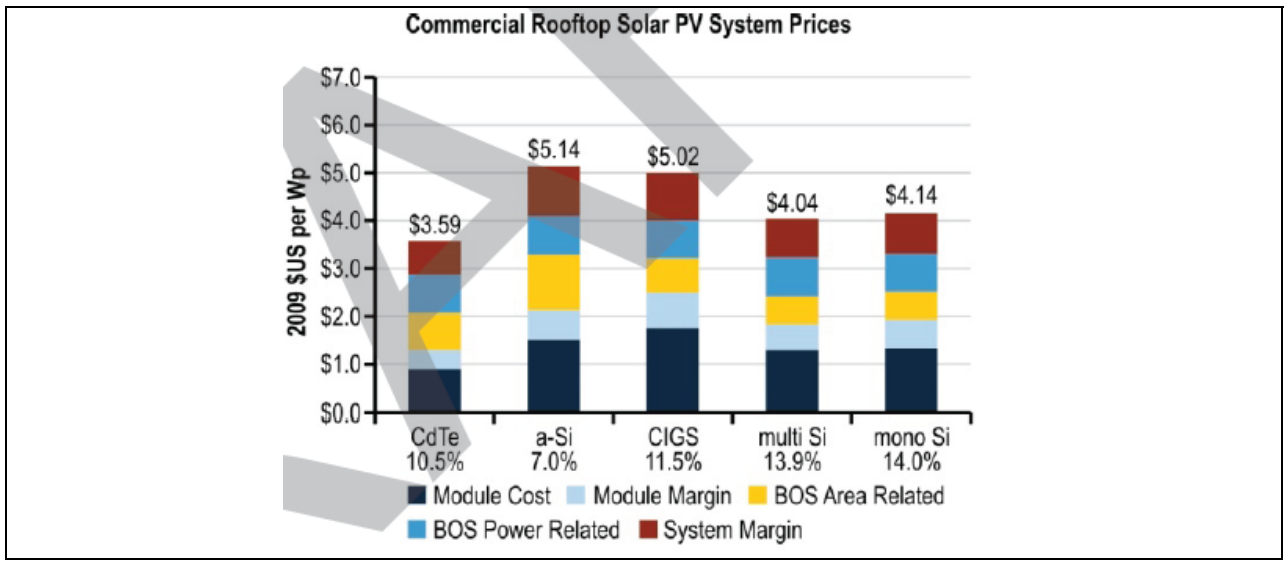
[38] Ibid, Tables 4-5, 4-7, 4-8, pp. 4-6 and 4-7.
[39] Ibid, Figure 4-1, p. 4-8.

reference case.[40] This conclusion was reached despite a number of controversial cost assumptions by the CPUC that favored the 33 percent RPS reference case.[41] An additional controversial assumption is the low assumed cost of new transmission to realize the 33 percent reference case. The CPUC assumed the total cost of new transmission would be $12 billion. The current estimate is over $27 billion.[42] When current projections regarding the cost of new transmission and associated upgrades are used, the high distributed generation alternative is more cost-effective than the 33 percent reference case.

The RETI capital cost values for PV assume 20 MW systems located at distribution substations. However, even the cost of individual commercial rooftop PV installations is now lower than the RETI cost of $5.35 to $5.55/Wac for dry-cooled solar thermal plants.

The May 2010 DOE Solar Vision Study (draft) projection of current commercial rooftop PV capital cost is provided in Figure 3.[43] These capital cost values are provided in Wdc. As shown in Figure 2, the current capital cost of commercial rooftop polysilicon PV (multi Si and mono Si) is approximately $4/Wdc. RETI identifies the range of dc-to-ac conversion factors of 0.77 to 0.85.[44] Using an average dc-to-ac conversion factor of 0.80, the capital cost of commercial rooftop polysilicon PV is approximately $4/Wdc ÷ 0.80 = $5/Wac. This is incrementally less than the $5.35 to $5.55/Wac capital cost of dry-cooled solar thermal, and the commercial rooftop PV array could be as little as 1/1,000th the size of the solar thermal plant. The most common form of thin-film PV, CdTe (cadmium-telluride), is lower in cost than polysilicon PV at approximately $3.60/Wdc. This converts to $3.60/Wdc ÷ 0.80 = $4.50/Wac.

Figure 3. Cost of commercial rooftop PV identified by DOE



a-Si: amorphous silicon thin-film PV; CIGS: copper-indium-gallium-selenide thin-film PV.

[40] CPUC, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009, p. 31.
[41] RightCycle Inc. comment letter, working group member response to June 2009 *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, in response to CPUC request for comments, August 28, 2009.
[42] J. Firooz, P.E., CAISO: *How Its Transmission Planning Process has Lost Sight of the Public's Interest*, April 2010, Table 2, p. 10. Total new transmission and upgrades necessary to realize 33 percent RPS reference case as of September 2009 - $27.544 billion.
[43] DOE, *DOE Solar Vision Study – DRAFT*, May 28, 2010, Chapter 4, Figure 4-4, p. 7.
[44] RETI, *Phase 1A Final Report*, August 2008, Appendix B, p. 5-5.

I. Market Price Referent with Adjustment for On-Peak Power Output Benefit of Distributed PV would be Sufficient Price to Assure Rapid Construction of 250 MW Distributed PV Alternative to GSEP

The MPR that renewable energy projects are currently compared to, the cost of power generation from a hypothetical new natural gas-fired baseload power plant, is $0.12126/kWh.[45] Solar PV produces a substantial amount of output during on-peak summer demand periods. The electric power tariff during summer on-peak periods is much higher than the average tariff over the course of a year. For example, SCE's tariff pays 3.13 times the base MPR for deliveries during the summer on-peak period.[46] SCE has determined that the adjusted MPR for a distributed PV system is 1.39 times the MPR for a baseload plant.[47] Multiplying the $0.12126/kWh MPR by 1.39 gives an adjusted MPR of $0.169/kWh. This price alone, based on my experience with the current pricing of distributed PV PPAs, may be a sufficient price signal for private developers to rapidly develop large-scale distributed PV in SCE and PG&E service territories.

However, the transmission & distribution benefits of distributed PV are real and have been quantified.[48] The estimated value range of the transmission and distribution benefits of distributed PV include $0.058/kWh in SDG&E territory and $0.023 to $0.037/kWh in SCE territory. The transmission & distribution benefits of distributed PV in PG&E territory vary widely. Some examples in PG&E territory include Fresno at $0.026/kWh and Stockton at $0.039/kWh. These estimates were developed using the E3 model for calculating transmission & distribution benefits.[49]

An MPR-adjusted price of $0.169/kWh, plus an average transmission & distribution benefit of approximately $0.030/kWh, is equivalent to an overall value to the IOU of approximately $0.20/kWh. Any price paid for distributed PV by an IOU below this price threshold should result in a net benefit to all of the IOU's ratepayers. A distributed PV price in the range $0.20/kWh would be more than sufficient to create a dynamic market for third party development of large-scale distributed PV in California urban areas.

J. Rooftop Commercial PV is More Space Efficient than GSEP and has None of the Environmental Impacts of GSEP

The RSA states, without citation: "However, based on SCE's use of 600,000-square-feet for 2 MW(ac) of energy, 75 million square feet (approximately 1,750 acres) would be required for 250 MW" (p. B2-67). SCE states in its March 2008 solar PV program testimony that 125,000 square feet of polysilicon panels are required to generate 1 MWdc.[50] This converts to about 150,000

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[45] CPUC Resolution E-4214, *2008 Market Price Referent values for use in the 2008 Renewable Portfolio Standard solicitations*, December 18, 2008. MPR, 2012 operational date, 20-yr PPA: $0.12126/kWh.
[46] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Supplemental Rebuttal Testimony*, October 14, 2008, p. 3, footnote 2. "ToD (time of day) adjustment estimate calculated as weighted average of (512 summer – on hours at 3.13, 768 summer – mid at 1.35, and 2,189 winter – mid hours at 1.00) = 1.39."
[47] Ibid.
[48] CPUC Rulemaking R.06-02-012, Develop Additional Methods to Implement California RPS Program, *Pre-Workshop Comments of GreenVolts, Cleantech America, and Community Environmental Council on the 2008 Market Price Referent*, March 6, 2008, p. 15.
[49] Ibid, p. 14.
[50] SCE Application A.08-03-015, *Solar Photovoltaic (PV) Program Testimony*, March 27, 2008, p. 32.

square feet per MWac, or approximately 3.5 acres per MWac.[51] This is one-half the square-footage per MWac that the RSA erroneously attributes to SCE rooftop installations. SCE has signed contracts with SunPower and Trina Solar, both suppliers of polysilicon PV panels, to provide a combined total of 245 MW of the 250 MW of PV capacity that will be owned by SCE.[52,53]

Rooftop PV is also approximately twice as space efficient as the GSEP project. The RSA states that 1,800 acres will be developed to produce 250 MWac (p. B1-2). This is more than 7 acres per MWac.

The predominant advantage of rooftop (or parking lot) PV is that it represents a compatible dual use of existing developed structures with no environmental impacts. As the RSA correctly notes, "Distributed solar PV is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required and there would be few associated biological impacts" (p. B.2-68).

K. RSA Concerns about Sufficient PV Panel Manufacturing Capacity Are Baseless

The concerns expressed in the RSA regarding the availability of distributed solar PV are without foundation. The RSA states (p. B.2-70): "While it will very likely be possible to achieve 250 MW of distributed solar energy over the coming years, the very limited number of existing facilities make it difficult to conclude with confidence that it will happen within the timeframe required for the GSEP. As a result, this technology is eliminated from detailed analysis in this RSA." Over 21,000 MW of PV systems, most of them distributed PV systems, were operational worldwide by the end of 2009.[54] More than 7,000 MW of PV was installed worldwide in 2009 alone.[55] In contrast, only 127 MW of solar thermal plants were constructed in 2009.[56]

Thin-film PV manufacturing capacity is projected to reach 7,400 MW per year in 2010.[57] First Solar alone manufactured and shipped more than 1,000 MW of thin-film panels in 2009.[58]

Worldwide conventional polysilicon PV production capacity reached 13,300 MW a year in 2008.[59] It is projected to reach 20,000 MW a year in 2010. The 2010 projections were made just as the economic slump began in late 2008. It is likely there will be some scale-back on the 2010 capacity additions due to the state of the world economy. Nonetheless, there is a tremendous amount of available worldwide PV manufacturing capacity.

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[51] There are 43,560 square feet per acre. Therefore, 150,000 square feet per MWac ÷ 43,560 square feet per acre = 3.44 acre/MWac.
[52] SNL Financial, *SoCalEd orders 200 MW of solar panels, plans solicitation for 250 MW more*, March 10, 2010.
[53] SNL Financial, *SoCalEd taps Trina Solar to supply 45 MW of PV modules*, June 9, 2010.
[54] Worldwatch Institute, *Record Growth in Photovoltaic Capacity and Momentum Builds for Concentrating Solar Power*, June 3, 2010.
[55] Ibid.
[56] Ibid.
[57] Schreiber, D. - EuPD Research, *PV Thin-film Markets, Manufacturers, Margins*, presentation at 1st Thin-Film Summit, San Francisco, December 1-2, 2008.
[58] First Solar press release, *First Solar Becomes First PV Company to Produce 1GW in a Single Year*, December 15, 2009.
[59] Schreiber, D. - EuPD Research, *PV Thin-film Markets, Manufacturers, Margins*, presentation at 1st Thin-Film Summit, San Francisco, December 1-2, 2008.

PV panel manufacturing capacity has greatly expanded worldwide in the last 2 to 3 years. The current estimated oversupply of PV panel manufacturing capacity for 2010 is 8,000 MW.[60] As a result of this oversupply, the cost of conventional polysilicon PV panels has dropped precipitously and is approaching the cost of thin-film PV panels (see Figure 3).

The RSA states that California added 158 MW of distributed PV in 2008 (p. B.2-66). California is a relatively minor player on the world PV stage. Spain added approximately 2,500 MW of primarily distributed ground-mounted PV resources in 2008.[61] Spain has a smaller economy than California. Germany, approximately the same size as California and with considerably lower solar intensity, added approximately 1,500 MW of distributed PV resources in 2008 and 3,800 MW in 2009.[62,63] Germany had an installed PV capacity of nearly 9,000 MW at the end of 2009 and has set a target PV installation rate of 3,500 MW per year.[64] The RSA expresses concerns regarding the feasibility of California doubling its 158 MW per year (2008) distributed PV installation rate as a substitute for GSEP, stating (p. B.2-69): "This would require an even more aggressive deployment of PV at more than double the historic rate of solar PV implementation than the California Solar Initiative program currently employs." This doubling of distributed PV deployment is equivalent to going from 1/20th to 1/10th the current German distributed PV installation rate. The feasibility concern expressed in the RSA is unfounded in light of German success with a high rate of distributed PV deployment.

The high distributed PV alternative studied by the CPUC anticipates the installation of 15,000 MW of distributed PV by 2020.[65] RETI has gradually dropped the amount of new renewable energy resources needed to reach 33 percent by 2020, the "net short," from 74,650 gigawatt-hours (GWh) per year initially to a current "low load" net short of 36,926 MW.[66] The low load net short is one-half the net short used by the CPUC in June 2009 to estimate the cost of achieving 33 percent by 2020. 15,000 MW of distributed PV would provide about 30,000 GWh/yr.[67] 15,000 MW of distributed PV would provide over 80 percent of the low load net short of 36,926 MW.

California could easily install 15,000 MW of distributed PV by 2020 if it approached the annual distributed PV installation rates that have already been achieved in practice in Spain and Germany. Existing worldwide PV manufacturing capacity, either thin-film alone or thin-film and

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[60] B. Murphy – Fulcrum Technologies, Inc., *The Power and Potential of CdTe (thin-film) PV*, presented at 2nd Thin-Film Summit, San Francisco, December 1-2, 2009.
[61] PV Tech, *Worldwide photovoltaics installations grew 110% in 2008, says Solarbuzz*, March 16, 2009.
[62] PV Tech, *German market booming: Inverter and module supplies running out at Phoenix Solar*, November 15, 2009.
[63] Worldwatch Institute, *Record Growth in Photovoltaic Capacity and Momentum Builds for Concentrating Solar Power*, June 3, 2010.
[64] Chadbourne & Parke Project Finance Newswire, *Germany Cuts Solar Subsidy*, April 2010.
[65] CPUC, *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, June 2009.
[66] RETI discussion draft, *RETI Net Short Update - Evaluating the Need for Expanded Electric Transmission Capacity for Renewable Energy*, February 22, 2010. Low load scenario, net short = 36,926 MW.
[67] The CPUC reference case assumes 3,235 MW of solar PV will generate 6,913 GWh per year under ideal Southern California desert solar insolation conditions. This is a production ratio of 2,137 GWh per MWac. However, solar insolation in the Central Valley and California urban areas will on average be approximately 10 less than ideal desert sites. For this reason a production ratio of 2,000 GWh per year per MWac is assumed for the Central Valley and urban areas.

conventional polysilicon, could readily supply a PV demand of 1,500 to 2,500 MW a year in California.

L. Slight Reduction in Output from Distributed PV in Los Angeles, Central Valley, or Bay Area Is Offset by Transmission Losses from GSEP to These Load Centers

The RSA implies that the superior solar intensity at the GSEP location in the Mojave Desert is a substantive reason for eliminating distributed PV from consideration, stating (p. B.2-67):

> "The location of the distributed solar PV would impact the capacity factor of the distributed solar PV. Capacity factor depends on a number of factors including the insolation of the site. Because a distributed solar PV alternative would be located throughout the state of California, the insolation at some of these locations may be less than in the Mojave Desert."

The solar insolation at the GSEP site is about 10 to 15 percent better than the composite solar insolation for Los Angeles, the Central Valley, and Oakland.[68,69] However, the CEC estimates average transmission losses in California at 7.5 percent and peak transmission losses at 14 percent.[70] The incrementally better solar insolation at the GSEP site is almost completely negated by the losses incurred by transmitting GSEP solar power to California urban areas. In contrast, distributed PV has minimal losses between generation and user.

M. CEC Has Already Determined Distributed PV Can Compete Cost-Effectively with Other Forms of Generation

The CEC denied an application for a 100-megawatt natural-gas-fired gas turbine power plant, the Chula Vista Energy Upgrade Project (CVEUP), in June 2009 in part because rooftop solar PV could potentially achieve the same objectives for comparable cost.[71]

This June 2009 CEC decision implies that any future applications for gas-fired generation in California, or any other type of generation including remote central station renewable energy generation like GSEP that require public land and new transmission to reach demand centers, should be measured against using urban PV to meet the power need. The CEC's final decision in the CVEUP case stated:[72]

> "Photovoltaic arrays mounted on existing flat warehouse roofs or on top of vehicle shelters in parking lots do not consume any acreage. The warehouses and parking lots continue to perform those functions with the PV in place. (Ex. 616, p. 11.)….Mr. Powers (expert for intervenor) provided detailed analysis of the costs of such PV, concluding that there was little or no difference between the cost of energy provided by a project such as

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[68] U.S. DOE, *Stand-Alone Flat-plate Photovoltaic Systems: System Sizing and Life-Cycle Costing Methodology for Federal Agencies*, 1984, Appendix, p. A-27.
[69] NREL, *Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors*, California cities data: http://rredc.nrel.gov/solar/pubs/redbook/PDFs/CA.PDF
[70] E-mail communication between Don Kondoleon, manager - CEC Transmission Evaluation Program, and Bill Powers of Powers Engineering, January 30, 2008.
[71] CEC, Chula Vista Energy Upgrade Project - Application for Certification (07-AFC-4) San Diego County, *Final Commission Decision*, June 2009.
[72] Ibid, pp. 29-30.

> the CVEUP (gas turbine peaking plant) compared with the cost of energy provided by PV. (Ex. 616, pp. 13 – 14.)….PV does provide power at a time when demand is likely to be high—on hot, sunny days. Mr. Powers acknowledged on cross-examination that the solar peak does not match the demand peak, but testified that storage technologies exist which could be used to manage this. The essential points in Mr. Powers' testimony about the costs and practicality of PV were uncontroverted."

The CEC concluded in the CVEUP final decision that PV arrays on rooftops and over parking lots may be a viable alternative to the gas turbine project proposed in that case, and that if the gas turbine project proponent opted to file a new application a much more detailed analysis of the PV alternative would be required.

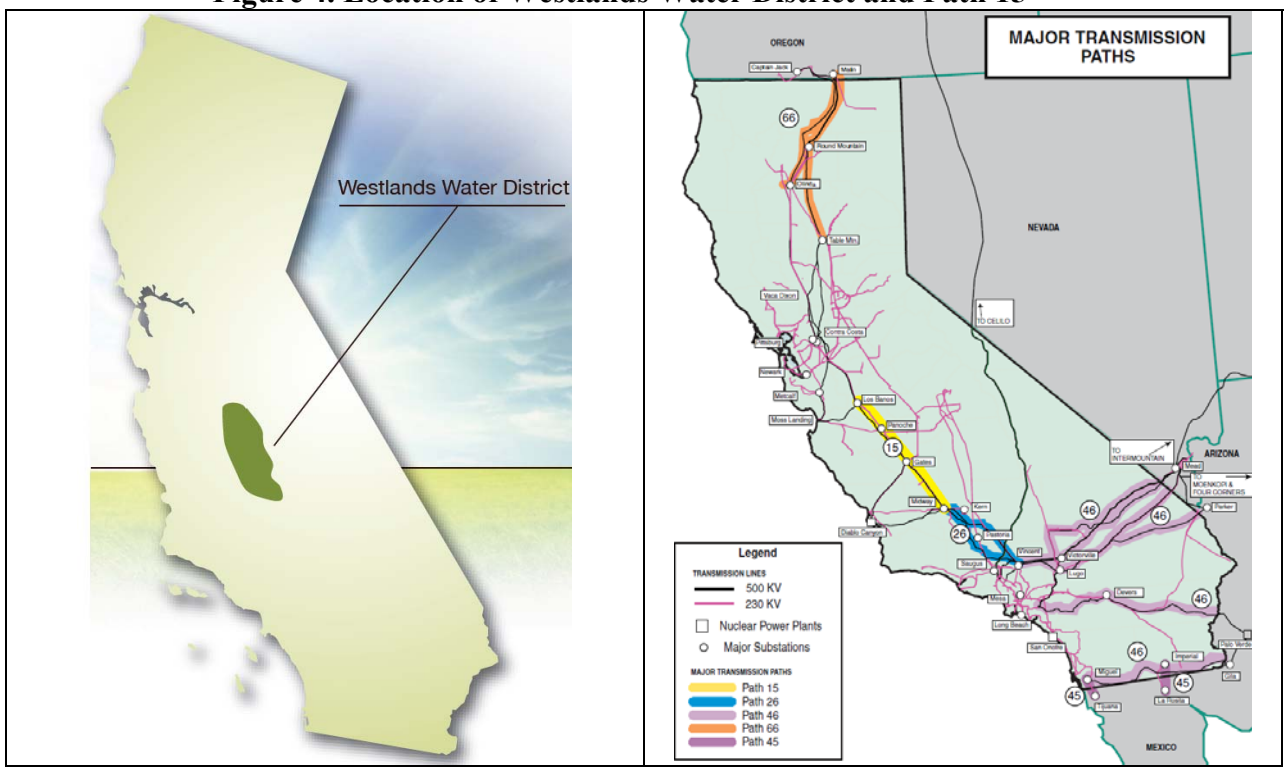
IV. Locating GSEP in the Proposed Westlands Water District CREZ would Avoid Environmental Impacts at the GSEP Site

The Westlands Water District ("Westlands"), on the west side of the Central Valley, is undergoing study by RETI as a Competitive Renewable Energy Zone (CREZ) capable of providing 5,000 MW of utility-scale solar development. Westlands covers over 600,000 acres of farmland in western Fresno and Kings Counties. The proposed "Central California Renewable Master Plan" will utilize permanently retired farmlands in Westlands for solar development. An overview of this master plan is attached. As stated in the master plan overview, "Due to salinity contamination issues, a portion of this disturbed land has been set aside for retirement and will be taken out of production under an agreement between Westlands and the U.S. Department of Interior." Approximately 30,000 acres of disturbed Westlands land, equivalent to 5,000 MW of solar capacity, will be allocated for renewable energy development under the plan.

Transmission Pathway 15 passes through Westlands. Path 15 can transmit 5,400 MW from south-to-north.[73] The transmission capacity from north-to-south is 3,400 MW. The location of Westlands relative to Path 15 is shown in Figure 4.

[73] Transmission & Distribution World, California bulks up to provide more transmission capacity, June 1, 2004.

Figure 4. Location of Westlands Water District and Path 15[74,75]



5,000 MW of solar power can be developed in Westlands with potentially no expansion of the existing Path 15 high voltage transmission capacity that serves Westlands now.

5,000 MW is half of the total remote in-state utility-scale solar contemplated in the June 2009 CPUC 33 percent reference case.[76] The remote in-state solar component of the reference case consists of 3,235 MW central station PV and 6,764 MW central station solar thermal. The anticipated energy output of 5,000 MW of fixed PV in Westlands would be about 10,000 GWh/yr.[77] This is approximately 30 percent of the RETI low load net short of 36,926 MW.

The RSA states that the Gabrych disturbed lands alternative near the GSEP site does not meet project objectives due to the inability to assure site control of multiple private parcels by the end of 2010 (p. B.2-53). Site control would not be an issue in the proposed Westlands CREZ. Westlands is actively marketing the 30,000-acre area for development of central station solar power plants. Development of solar projects on the Westlands property is intended (by Westlands) to serve as a source of income on land that has been permanently retired from agricultural production.

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[74] Anthem Group press release, Central California Renewable Master Plan, March 2010.
[75] CEC, *Strategic Transmission Investment Plan*, November 2005, p. 11.
[76] CPUC, *33% RPS Implementation Analysis Preliminary Results*, June 2009, Appendix C, p. 87.
[77] The CPUC reference case assumes 3,235 MW of solar PV will generate 6,913 GWh per year under ideal Southern California desert solar insolation conditions. This is a production ratio of 2,137 GWh per MWac. However, solar insolation in the Central Valley and California urban areas will on average be approximately 10 less than ideal desert sites. For this reason a production ratio of 2,000 GWh per year per MWac is assumed for the Central Valley and urban areas.

Prioritizing distributed PV projects, combined with the location of central station solar projects in Westlands, would allow California to achieve its 33 percent by 2020 renewable energy target with almost no environmental impacts related to the solar energy component of the renewable energy portfolio.

V. Conclusions

The RSA analysis of the distributed PV alternative to GSEP uses flawed logic and outdated data to improperly eliminate distributed PV as an alternative. In fact, distributed PV is a fully viable and cost-effective alternative that eliminates the environmental impacts that would be caused by the GSEP project. The RSA should have concluded that distributed PV is a superior alternative to the GSEP project.

Beyond the issue of distributed PV being a superior alternative to GSEP on cost and environmental grounds, there are lower-impact sites in California for central station solar projects like GSEP. The Westlands Water District is a low impact "shovel ready" alternative to the GSEP site for central station solar projects. Westlands requires no new high voltage transmission to move up to 5,000 MW of solar power to California load centers. This means solar projects located in Westlands will not face project delays due to lack of high voltage transmission capacity. The steadily declining renewable energy net short to achieve the 33 percent by 2020 target, now as low as 36,926 MW, means fewer renewable projects overall are necessary to meet the 33 percent target. The CEC should not approve solar projects with unmitigatable impacts like GSEP when 5,000 MW of otherwise unusable disturbed land with no environmental issues and 5,000 MW of high voltage transmission capacity sits idle.

Declaration of Bill Powers, P.E.

Re: Testimony on Alternatives to the Application for Certification for the Genesis Solar Energy Project

Docket No. 09-AFC-8

I, Bill Powers, declare as follows:

1) I am a self-employed consulting engineer.

2) My relevant professional qualifications and experience are set forth in the attached resume and the attached testimony and are incorporated herein by reference.

3) I prepared the testimony attached hereto and incorporated herein by reference, relating to the distributed PV alternative to the project.

4) I prepared the testimony attached hereto and incorporated herein by reference relating to the proposed Genesis Solar Energy Project.

5) It is my professional opinion that the attached testimony is true and accurate with respect to the issues that it addresses.

6) I am personally familiar with the facts and conclusions described within the attached testimony and if called as a witness, I could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: JUNE 18, 2010 Signed: Bill Powers, P.E.

At: SAN DIEGO, CA

BILL POWERS, P.E.

PROFESSIONAL HISTORY

Powers Engineering, San Diego, CA 1994-
ENSR Consulting and Engineering, Camarillo, CA 1989-93
Naval Energy and Environmental Support Activity, Port Hueneme, CA 1982-87
U.S. Environmental Protection Agency, Research Triangle Park, NC 1980-81

EDUCATION

Master of Public Health – Environmental Sciences, University of North Carolina
Bachelor of Science – Mechanical Engineering, Duke University

PROFESSIONAL AFFILIATIONS

Registered Professional Mechanical Engineer, California (Certificate M24518)
American Society of Mechanical Engineers
Air & Waste Management Association

TECHNICAL SPECIALTIES

Twenty-five years of experience in:

- San Diego and Baja California regional energy planning
- Power plant technology, emissions, and cooling system assessments
- Combustion and emissions control equipment permitting, testing, monitoring
- Oil and gas technology assessment and emissions evaluation
- Latin America environmental project experience

SAN DIEGO AND BAJA CALIFORNIA REGIONAL ENERGY PLANNING

San Diego Smart Energy 2020 Plan. Author of October 2007 "San Diego Smart Energy 2020," an energy plan that focuses on meeting the San Diego region's electric energy needs through accelerated integration of renewable and non-renewable distributed generation, in the form of combined heat and power (CHP) systems and solar photovoltaic (PV) systems. PV would meet approximately 28 percent of the San Diego region's electric energy demand in 2020. CHP systems would provide approximately 47 percent. Annual energy demand would drop 20 percent in 2020 relative to 2003 through use all cost-effective energy efficiency measures. This target is based on City of San Diego experience. San Diego has consistently achieved energy efficiency reductions of 20 percent on dozens of projects. Existing utility-scale gas-fired generation would continue to be utilized to provide power at night, during cloudy whether, and for grid reliability support.

Photovoltaic technology selection and siting for SDG&E Solar San Diego project. Served as PV technology expert in California Public Utilities Commission proceeding to define PV technology and sites to be used in San Diego Gas & Electric (SDG&E) $250 million "Solar San Diego" project. Recommendations included: 1) prioritize use of roof-mounted thin-film PV arrays similar to the SCE urban PV program to maximize the installed PV capacity, 2) avoid tracking ground-mounted PV arrays due to high cost and relative lack of available land in the urban/suburban core, 3) and incorporate limited storage in fixed rooftop PV arrays to maximizing output during peak demand periods. Suitable land next to SDG&E substations capable of supporting 5 to 40 MW of PV (each) was also identified by Powers Engineering as a component of this project.

Photovoltaic arrays as alternative to natural gas-fired peaking gas turbines, Chula Vista. Served as PV technology expert in California Energy Commission (CEC) proceeding regarding the application of MMC Energy to build a 100 MW peaking gas turbine power plant in Chula Vista. Presented testimony that 100 MW of PV arrays in the Chula Vista area could provide the same level of electrical reliability on hot summer days as

an equivalent amount of peaking gas turbine capacity at approximately the same cost of energy. The preliminary decision issued by the presiding CEC commissioner in the case recommended denial of the application in part due to failure of the applicant or CEC staff to thoroughly evaluate the PV alternative to the proposed turbines. No final decision has yet been issued in the proceeding (as of May 2009).

San Diego Area Governments (SANDAG) Energy Working Group. Public interest representative on the SANDAG Energy Working Group (EWG). The EWG advises the Regional Planning Committee on issues related to the coordination and implementation of the Regional Energy Strategy 2030 adopted by the SANDAG Board of Directors in July 2003. The EWG consists of elected officials from the City of San Diego, County of San Diego and the four subareas of the region. In addition to elected officials, the EWG includes stakeholders representing business, energy, environment, economy, education, and consumer interests.

Development of San Diego Regional Energy Strategy 2030. Participant in the 18-month process in the 2002-2003 timeframe that led to the development of the San Diego Regional Energy Strategy 2030. This document was adopted by the SANDAG Board of Directors in July 2003 and defines strategic energy objectives for the San Diego region, including: 1) in-region power generation increase from 65% of peak demand in 2010 to 75% of peak demand in 2020, 2) 40% renewable power by 2030 with at least half of this power generated in-county, 3) reinforcement of transmission capacity as needed to achieve these objectives. The SANDAG Board of Directors voted unanimously on Nov. 17, 2006 to take no position on the Sunrise Powerlink proposal primarily because it conflicts the Regional Energy Strategy 2030 objective of increased in-region power generation. The Regional Energy Strategy 2030 is online at: http://www.energycenter.org/uploads/Regional_Energy_Strategy_Final_07_16_03.pdf

Imperial Valley Study Group. Participant in the Imperial Valley Study Group (IVSG), and effort funded by the CEC to examine transmission options for maximizing the development of geothermal resources in Imperial County. Advised the IVSG that no alternatives other than the Sunrise Powerlink or a similar variant were be considered to move Imperial Valley geothermal generation to San Diego. Initiated a dialogue on IVSG's failure to consider alternatives that was incorporated into the IVSG April 12, 2005 meeting minutes (see: http://www.energy.ca.gov/ivsg/documents/2005-04-12_meeting/2005-04-12_AMNDED_IVSG_MINUTES.PDF). Also co-authored with the Utility Consumers' Action Network an October 14, 2005 alternative letter report to the September 30, 2005 IVSG final report that documents numerous feasible transmission alternatives to the Sunrise Powerlink that were not considered by IVSG. The October 14, 2005 IVSG alternative letter report also served as a comment letter on the CEC's 2005 Integrated Energy Policy Report webpage is available at: http://www.energy.ca.gov/2005_energypolicy/documents/2005-10-11_DER_comments/10-14 05_Utility_Consumers_Action_Network_BPPWG.pdf

COMBUSTION AND EMISSIONS CONTROL EQUIPMENT PERMITTING, TESTING, MONITORING

EPRI Gas Turbine Power Plant Permitting Documents – Co-Author. Co-authored two Electric Power Research Institute (EPRI) gas turbine power plant siting documents. Responsibilities included chapter on state-of-the-art air emission control systems for simple-cycle and combined-cycle gas turbines, and authorship of sections on dry cooling and zero liquid discharge systems.

Air Permits for 50 MW Peaker Gas Turbines – Six Sites Throughout California. Responsible for preparing all aspects of air permit applications for five 50 MW FT-8 simple-cycle turbine installations at sites around California in response to emergency request by California state government for additional peaking power. Units were designed to meet 2.0 ppm NO_x using standard temperature SCR and innovative dilution air system to maintain exhaust gas temperature within acceptable SCR range. Oxidation catalyst is also used to maintain CO below 6.0 ppm.

Kauai 27 MW Cogeneration Plant – Air Emission Control System Analysis. Project manager to evaluate technical feasibility of SCR for 27 MW naphtha-fired turbine with once-through heat recovery steam generator. Permit action was stalled due to questions of SCR feasibility. Extensive analysis of the performance of existing oil-fired turbines equipped with SCR, and bench-scale tests of SCR applied to naphtha-fired turbines, indicated

that SCR would perform adequately. Urea was selected as the SCR reagent given the wide availability of urea on the island. Unit is first known application of urea-injected SCR on a naphtha-fired turbine.

Microturbines – Ronald Reagan Library, Ventura County, California. Project manager and lead engineer or preparation of air permit applications for microturbines and standby boilers. The microturbines drive the heating and cooling system for the library. The microturbines are certified by the manufacturer to meet the 9 ppm NO_x emission limit for this equipment. Low-NO_x burners are BACT for the standby boilers.

Hospital Cogeneration Microturbines – South Coast Air Quality Management District. Project manager and lead engineer for preparation of air permit application for three microturbines at hospital cogeneration plant installation. The draft Authority To Construct (ATC) for this project was obtained two weeks after submittal of the ATC application. 30-day public notification was required due to the proximity of the facility to nearby schools. The final ATC was issued two months after the application was submitted, including the 30-day public notification period.

Gas Turbine Cogeneration – South Coast Air Quality Management District. Project manager and lead engineer for preparation of air permit application for two 5.5 MW gas turbines in cogeneration configuration for county government center. The turbines will be equipped with selective catalytic reduction (SCR) and oxidation catalyst to comply with SCAQMD BACT requirements. Aqueous urea will be used as the SCR reagent to avoid trigger hazardous material storage requirements. A separate permit will be obtained for the NO_x and CO continuous emissions monitoring systems. The ATCs is pending.

Industrial Boilers – NO_x BACT Evaluation for San Diego County Boilers. Project manager and lead engineer for preparation of Best Available Control Technology (BACT) evaluation for three industrial boilers to be located in San Diego County. The BACT included the review of low NO_x burners, FGR, SCR, and low temperature oxidation (LTO). State-of-the-art ultra low NO_x burners with a 9 ppm emissions guarantee were selected as NO_x BACT for these units.

Peaker Gas Turbines – Evaluation of NO_x Control Options for Installations in San Diego County. Lead engineer for evaluation of NO_x control options available for 1970s vintage simple-cycle gas turbines proposed for peaker sites in San Diego County. Dry low-NO_x (DLN) combustors, catalytic combustors, high-temperature SCR, and NO_x absorption/conversion ($SCONO_x$) were evaluated for each candidate turbine make/model. High-temperature SCR was selected as the NOx control option to meet a 5 ppm NO_x emission requirement.

Hospital Cogeneration Plant Gas Turbines – San Joaquin Valley Unified Air Pollution Control District. Project manager and lead engineer for preparation of air permit application and BACT evaluation for hospital cogeneration plant installation. The BACT included the review of DLN combustors, catalytic combustors, high-temperature SCR and $SCONO_x$. DLN combustion followed by high temperature SCR was selected as the NO_x control system for this installation. The high temperature SCR is located upstream of the heat recovery steam generator (HRSG) to allow the diversion of exhaust gas around the HRSG without compromising the effectiveness of the NO_x control system.

Industrial Cogeneration Plant Gas Turbines – Upgrade of Turbine Power Output. Project manager and lead engineer for preparation of BACT evaluation for proposed gas turbine upgrade. The BACT included the review of DLN combustors, catalytic combustors, high-, standard-, and low-temperature SCR, and $SCONO_x$. Successfully negotiated air permit that allowed facility to initially install DLN combustors and operate under a NO_x plantwide "cap." Within two major turbine overhauls, or approximately eight years, the NO_x emissions per turbine must be at or below the equivalent of 5 ppm. The 5 ppm NO_x target will be achieved through technological in-combustor NO_x control such as catalytic combustion, or SCR or SCR equivalent end-of-pipe NO_x control technologies if catalytic combustion is not available.

Gas Turbines – Modification of RATA Procedures for Time-Share CEM. Project manager and lead engineer for the development of alternate CO continuous emission monitor (CEM) Relative Accuracy Test Audit (RATA) procedures for time-share CEM system serving three 7.9 MW turbines located in San Diego. Close interaction with San Diego APCD and EPA Region 9 engineers was required to receive approval for the alternate CO RATA standard. The time-share CEM passed the subsequent annual RATA without problems as a result of changes to some of the CEM hardware and the more flexible CO RATA standard.

Gas Turbines – Evaluation of NO_x Control Technology Performance. Lead engineer for performance review of dry low-NO_x combustors, catalytic combustors, high-, standard-, and low-temperature selective catalytic reduction (SCR), and NO_x absorption/conversion ($SCONO_x$). Major turbine manufacturers and major manufacturers of end-of-pipe NO_x control systems for gas turbines were contacted to determine current cost and performance of NO_x control systems. A comparison of 1993 to 1999 "$/kwh" and "$/ton" cost of these control systems was developed in the evaluation.

Gas Turbines – Evaluation of Proposed NO_x Control System to Achieve 3 ppm Limit. Lead engineer for evaluation for proposed combined cycle gas turbine NO_x and CO control systems. Project was in litigation over contract terms, and there was concern that the GE Frame 7FA turbine could not meet the 3 ppm NO_x permit limit using a conventional combustor with water injection followed by SCR. Operations personnel at GE Frame 7FA installatins around the country were interviewed, along with principal SCR vendors, to corroborate that the installation could continuously meet the 3 ppm NO_x limit.

Gas Turbines – Title V "Presumptively Approvable" Compliance Assurance Monitoring Protocol. Project manager and lead engineer for the development of a "presumptively approval" NO_x parametric emissions monitoring system (PEMS) protocol for industrial gas turbines. "Presumptively approvable" means that any gas turbine operator selecting this monitoring protocol can presume it is acceptable to the U.S. EPA. Close interaction with the gas turbine manufacturer's design engineering staff and the U.S. EPA Emissions Measurement Branch (Research Triangle Park, NC) was required to determine modifications necessary to the current PEMS to upgrade it to "presumptively approvable" status.

Environmental Due Diligence Review of Gas Turbine Sites – Mexico. Task leader to prepare regulatory compliance due diligence review of Mexican requirements for gas turbine power plants. Project involves eleven potential sites across Mexico, three of which are under construction. Scope involves identification of all environmental, energy sales, land use, and transportation corridor requirements for power projects in Mexico. Coordinator of Mexican environmental subcontractors gathering on-site information for each site, and translator of Spanish supporting documentation to English.

Development of Air Emission Standards for Gas Turbines - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian gas turbine power plants. All major gas turbine power plants in Peru are currently using water injection to increase turbine power output. Recommended that 42 ppm on natural gas and 65 ppm on diesel (corrected to 15% O_2) be established as the NO_x limit for existing gas turbine power plants. These limits reflect NO_x levels readily achievable using water injection at high load. Also recommended that new gas turbine sources be subject to a BACT review requirement.

Gas Turbines – Title V Permit Templates. Lead engineer for the development of standardized permit templates for approximately 100 gas turbines operated by the oil and gas industry in the San Joaquin Valley. Emissions limits and monitoring requirements were defined for units ranging from GE Frame 7 to Solar Saturn turbines. Stand-alone templates were developed based on turbine size and NO_x control equipment. NO_x utilized in the target turbine population ranged from water injection alone to water injection combined with SCR.

Gas Turbines – Evaluation of NO_x, SO_2 and PM Emission Profiles. Performed a comparative evaluation of the NO_x, SO_2 and particulate (PM) emission profiles of principal utility-scale gas turbines for an independent power producer evaluating project opportunities in Latin America. All gas turbine models in the 40 MW to 240 MW range manufactured by General Electric, Westinghouse, Siemens and ABB were included in the evaluation.

Stationary Internal Combustion Engine (ICE) RACT/BARCT Evaluation. Lead engineer for evaluation of retrofit NO_x control options available for the oil and gas production industry gas-fired ICE population in the San Joaquin Valley affected by proposed Best Available Retrofit Control Technology (BARCT) emission limits. Evaluation centered on lean-burn compressor engines under 500 bhp, and rich-burn constant and cyclically loaded (rod pump) engines under 200 bhp. The results of the evaluation indicated that rich burn cyclically-loaded rod pump engines comprised 50 percent of the affected ICE population, though these ICEs accounted for only 5 percent of the uncontrolled gas-fired stationary ICE NO_x emissions. Recommended retrofit NO_x control strategies included: air/fuel ratio adjustment for rod pump ICEs, Non-selective catalytic reduction (NSCR) for rich-burn, constant load ICEs, and "low emission" combustion modifications for lean burn ICEs.

Development of Air Emission Standards for Stationary ICEs - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian stationary ICE power plants. Draft 1997 World Bank NO_x and particulate emission limits for stationary ICE power plants served as the basis for proposed MEM emission limits. A detailed review of ICE emissions data provided in PAMAs submitted to the MEM was performed to determine the level of effort that would be required by Peruvian industry to meet the proposed NO_x and particulate emission limits. The draft 1997 WB emission limits were revised to reflect reasonably achievable NO_x and particulate emission limits for ICEs currently in operation in Peru.

Air Toxics Testing of Natural Gas-Fired ICEs. Project manager for test plan/test program to measure volatile and semi-volatile organic air toxics compounds from fourteen gas-fired ICEs used in a variety of oil and gas production applications. Test data was utilized by oil and gas production facility owners throughout California to develop accurate ICE air toxics emission inventories.

Ethanol Plant Dryer – Penn-Mar Ethanol, LLC. Lead engineer on BACT evaluation for ethanol dryer. Dryer nitrogen oxide (NO_x) emission limit of 30 ppm determined to be BACT following exhaustive review of existing and pending ethanol plant air permits and discussions with principal dryer vendors.

BARCT Low NO_x Burner Conversion – Industrial Boilers. Lead engineer for a BARCT evaluation of low NO_x burner options for natural gas-fired industrial boilers. Also evaluated methanol and propane as stand-by fuels to replace existing diesel stand-by fuel system and replacement of steam boilers with gas turbine co-generation system.

BACT Packed Tower Scrubber/Mist Eliminator Performance Evaluations. Project manager and lead engineer for Navy-wide plating shop air pollution control technology evaluation and emissions testing program. Mist eliminators and packed tower scrubbers controlling metal plating processes, which included hard chrome, nickel, copper, cadmium and precious metals plating, were extensively tested at three Navy plating shops. Chemical cleaning and stripping tanks, including hydrochloric acid, sulfuric acid, chromic acid and caustic, were also tested. The final product of this program was a military design specification for plating and chemical cleaning shop air pollution control systems. The hydrochloric acid mist sampling procedure developed during this program received a protected patent.

BACT Packed Tower Scrubber/UV Oxidation System Pilot Test Program. Technical advisor for pilot test program of packed tower scrubber/ultraviolet (UV) light VOC oxidation system controlling VOC emissions

from microchip manufacturing facility in Los Angeles. The testing was sponsored in part by the SCAQMD's Innovative Technology Demonstration Program, to demonstrate this innovative control technology as BACT for microchip manufacturing operations. The target compounds were acetone, methylethylketone (MEK) and 1,1,1-trichloroethane, and compound concentrations ranged from 10-100 ppmv. The single stage packed tower scrubber consistently achieved greater than 90% removal efficiency on the target compounds. The residence time required in the UV oxidation system for effective oxidation of the target compounds proved significantly longer than the residence time predicted by the manufacturer.

BACT Pilot Testing of Venturi Scrubber on Gas/Aerosol VOC Emission Source. Technical advisor for project to evaluate venturi scrubber as BACT for mixed phase aerosol/gaseous hydrocarbon emissions from deep fat fryer. Venturi scrubber demonstrated high removal efficiency on aerosol, low efficiency on VOC emissions. A number of VOC tests indicated negative removal efficiency. This anomaly was traced to a high hydrocarbon concentration in the scrubber water. The pilot unit had been shipped directly to the jobsite from another test location by the manufacturer without any cleaning or inspection of the pilot unit.

Pulp Mill Recovery Boiler BACT Evaluation. Lead engineer for BACT analysis for control of SO_2, NO_x, CO, TNMHC, TRS and particulate emissions from the proposed addition of a new recovery furnace at a kraft pulp mill in Washington. A "top down" approach was used to evaluate potential control technologies for each of the pollutants considered in the evaluation.

Air Pollution Control Equipment Design Specification Development. Lead engineer for the development of detailed Navy design specifications for wet scrubbers and mist eliminators. Design specifications were based on field performance evaluations conducted at the Long Beach Naval Shipyard, Norfolk Naval Shipyard, and Jacksonville Naval Air Station. This work was performed for the U.S. Navy to provide generic design specifications to assist naval facility engineering divisions with air pollution control equipment selection. Also served as project engineer for the development of Navy design specifications for ESPs and fabric filters.

POWER PLANT TECHNOLOGY, EMISSIONS, AND COOLING SYSTEM ASSESSMENTS

IGCC and Low Water Use Alternatives to Eight Pulverized Coal Fired 900 MW Boilers. Expert for cities of Houston and Dallas on integrated gasification combined cycle (IGCC) as a fully commercial coal-burning alternative to the pulverized coal (PC) technology proposed by TXU for eight 900 MW boilers in East Texas. Also analyzed East Texas as candidate location for CO_2 sequestration due to presence of mature oilfield CO_2 enhanced oil recovery opportunities and a deep saline aquifer underlying the entire region. Presented testimony on the major increase in regional consumptive water use that would be caused by the evaporative cooling towers proposed for use in the PC plants, and that consumptive water use could be lowered by using IGCC with evaporative cooling towers or by using air-cooled condensers with PC or IGCC technology. TXU ultimately dropped plans to build the eight PC plants as a condition of a corporate buy-out.

Assessment of CO_2 Capture and Sequestration for IGCC Plants. Author of assessment prepared for a public interest client of CO_2 capture and sequestration options for IGCC plants. The assessment focuses on: 1) CO_2 sequestration performance of operational large-scale CO_2 sequestration projects, specifically the Weyburn CO_2 enhanced oil recovery (EOR) project, and 2) CO_2 EOR as the vehicle to offset the cost of CO_2 capture and serve as the platform for an initial set of U.S. IGCC plants equipped for full CO_2 capture and storage.

Assessment of IGCC Alternative to Proposed 250 MW Circulating Fluidized Bed (CFB) Unit. Lead engineer to evaluate IGCC option to proposed 250 MW CFB firing Powder River Basin coal. Project site is in Montana, where CO_2 EOR opportunities exist in the eastern part of the state.

500 MW Coal-Fired Plant –Air Cooling and IGCC. Provided expert testimony on the performance of air-cooling and IGCC relative to the conventional closed-cycle wet cooled, supercritical pulverized coal boiler proposed by the applicant. Steam Pro™ coal-fired power plant design software was used to model the proposed plant and evaluate the impacts on performance of air cooling and plume-abated wet cooling. Results

indicated that a conservatively designed air-cooled condenser could maintain rated power output at the design ambient temperature of 90 ^{o}F. The IGCC comparative analysis indicated that unit reliability comparable to a conventional pulverized coal unit could be achieved by including a spare gasifier in the IGCC design, and that the slightly higher capital cost of IGCC was offset by greater thermal efficiency and reduced water demand and air emissions.

Retrofit of SCR to Existing Natural Gas-Fired Units. Lead expert in successful representation of interests of the city of Carlsbad, California to prevent weakening of an existing countywide utility boiler NO_x rule. Weakening of NO_x rule would have allowed a 1,000 MW merchant utility boiler plant located in the city to operate without installing selective catalytic reduction (SCR) NO_x control systems. Ultimately the plant owner was compelled to comply with the existing NO_x rule and install SCR on all five boilers at the plant. This project required numerous appearances before the county air pollution control hearing board to successfully defend the existing utility boiler NO_x rule.

Proposed 1.500 MW Pulverized Coal Power Plant. Provided testimony challenge to air permit issued for Peabody Coal Company's proposed 1,500 MW pulverized-coal fired power plant in Kentucky. Presented case that IGCC is a superior method for producing power from coal, from both environmental and energy efficiency perspective, than the proposed pulverized-coal plant. Presented evidence that IGCC is technically feasible and cost-competitive with pulverized coal.

Presidential Permits to Two Border Power Plants – Contested Air and Water Issues. Provided testimony on the air emissions and water consumption impact of two export power plants, Intergen and Sempra, in Mexicali, Mexico, and modifications necessary to minimize these impacts, including air emission offsets and incorporation of air cooling. These two plants are located within 3 miles of the California border, are interconnected only to the SDG&E transmission grid, and under the local control of the California Independent System Operator. Provided evidence that the CAISO had restricted the amount of power these two plants could export when commercial operation began in June 2003 to avoid unacceptable levels of transmission congestion on SDG&E's transmission system. The federal judge determined that the DOE had conducted an inadequate environmental assessment before issuing the Presidential Permits for these two plants and ordered the DOE to prepare a more comprehensive assessment.

300 MW Coal-Fired Circulating Fluidized Bed Boiler Plant - Best Available NO_x Control System. Provided testimony in dispute in case where approximately 50 percent NO_x control using selective non-catalytic reduction (SNCR) was accepted as BACT for a proposed 300 MW circulating fluidized bed (CFB) boiler plant in Kentucky. Presented testimony that SNCR was capable of continuous NO_x reduction of greater than 70 percent on a CFB unit and that low-dust, hot side selective catalytic reduction (SCR) and tail-end SCR were technically feasible and could achieve greater than 90 percent NO_x reduction.

Conversion of Existing Once-Through Cooled Boilers to Wet Towers, Parallel Wet-Dry Cooling, or Dry Cooling. Prepared preliminary design for the conversion of four natural gas and/or coal-fired utility boilers (Unit 4, 235 MW; Unit 3, 135 MW; Unit 2, 65 MW; and Unit 1,65 MW) from once-through river water cooling to wet cooling towers, parallel wet-dry cooling, and dry cooling. Major design constraints were available land for location of retrofit cooling systems and need to maintain maximum steam turbine backpressure at or below 5.5 inches mercury to match performance capabilities of existing equipment. Approach temperatures of 12 ^{o}F and 13 ^{o}F were used for the wet towers. SPX Cooling Technologies F-488 plume-abated wet cells with six feet of packing were used to achieve approach temperatures of 12 ^{o}F and 13 ^{o}F. Annual energy penalty of wet tower retrofit designs is approximately 1 percent. Parallel wet-dry or dry cooling was determined to be technically feasible for Unit 3 based on straightforward access to the Unit 3 surface condenser and available land adjacent to the boiler.

Utility Boiler – Assessment of Closed-Cycle Cooling Retrofit Cost for 1,200 MW Oil-Fired Plant. Prepared an assessment of the cost and feasibility of a closed-cycle wet tower retrofit for the 1,200 MW

Roseton Generating Station in New York. Determined that the cost to retrofit the Roseton plant with plume-abated closed-cycle wet cooling was well established based on cooling tower retrofit studies performed by the original owner (Central Hudson Gas & Electric Corp.) and subsequent regulatory agency critique of the cost estimate. Also determined that elimination of redundant and/or excessive budgetary line items in owners cost estimate brings the closed-cycle retrofit in line with expected costs for comparable new or retrofit plume-abated cooling tower applications. Closed-cycle cooling has been accepted as an issue that will be adjudicated.

2,000 MW Nuclear Power Plant – Closed-Cycle Cooling Retrofit Feasibility. Prepared assessment of the cost and feasibility of a closed-cycle wet tower retrofit for the 2,000 MW Indian Point Generating Station in New York. Determined that the most appropriate arrangement for the hilly site would be an inline plume-abated wet tower instead of the round tower configuration analyzed by the owner. Use of the inline configuration would allow placement of the towers at numerous sites on the property with little or need for blasting of bedrock, greatly reducing the cost of the retrofit. Also proposed an alternative circulating cooling water piping configuration to avoid the extensive downtime projected by the owner for modifications to the existing discharge channel.

Best Available NO_x Control System for 525 MW Coal-Fired Circulating Fluidized Bed Boiler Plant. Provided testimony in dispute over whether 50 percent NO_x control using selective non-catalytic reduction (SNCR) constituted BACT for a proposed 525 MW circulating fluidized bed (CFB) boiler plant in Pennsylvania. Presented testimony that SNCR was capable of continuous NO_x reduction of greater than 70 percent on a CFB unit and that tail-end selective catalytic reduction (SCR) was technically feasible and could achieve greater than 90 percent NO_x reduction.

Evaluation of Correlation Between Opacity and PM_{10} Emissions at Coal-Fired Plant. Provided testimony on whether correlation existed between mass PM_{10} emissions and opacity during opacity excursions at large coal-fired boiler in Georgia. EPA and EPRI technical studies were reviewed to assess the correlation of opacity and mass emissions during opacity levels below and above 20 percent. A strong correlation between opacity and mass emissions was apparent at a sister plant at opacities less than 20 percent. The correlation suggests that the opacity monitor correlation underestimates mass emissions at opacities greater than 20 percent, but may continue to exhibit a good correlation for the component of mass emissions in the PM_{10} size range.

Emission Increases Associated with Retrofit of SCR Existing Coal-Fired Units. Provided testimony in successful effort to compel an existing coal-fired power plant located in Massachusetts to meet an accelerated NO_x and SO_2 emission control system retrofit schedule. Plant owner argued the installation of advanced NO_x and SO_2 control systems would generate > 1 ton/year of ancillary emissions, such as sulfuric acid mist, and that under Massachusetts Dept. of Environmental Protection regulation ancillary emissions > 1 ton/year would require a BACT evaluation and a two-year extension to retrofit schedule. Successfully demonstrated that no ancillary emissions would be generated if the retrofit NO_x and SO_2 control systems were properly sized and optimized. Plant owner committed to accelerated compliance schedule in settlement agreement.

1,000 MW Coastal Combined-Cycle Power Plant – Feasibility of Dry Cooling. Expert witness in on-going effort to require use of dry cooling on proposed 1,000 MW combined-cycle "repower" project at site of an existing 1,000 MW utility boiler plant in central coastal California. Project proponent argued that site was two small for properly sized air-cooled condenser (ACC) and that use of ACC would cause 12-month construction delay. Demonstrated that ACC could easily be located on the site by splitting total of up to 80 cells between two available locations at the site. Also demonstrated that an ACC optimized for low height and low noise would minimize or eliminate proponent claims of negative visual and noise impacts.

CONTINUOUS EMISSION MONITOR (CEM) PROJECT EXPERIENCE

Process Heater CO and NO_x CEM Relative Accuracy Testing. Project manager and lead engineer for process heater CO and NO_x analyzer relative accuracy test program at petrochemical manufacturing facility. Objective of test program was to demonstrate that performance of onsite CO and NO_x CEMs was in compliance

with U.S. EPA "Boiler and Industrial Furnace" hazardous waste co-firing regulations. A TECO Model 48 CO analyzer and a TECO Model 10 NO_x analyzer were utilized during the test program to provide $\pm$1 ppm measurement accuracy, and all test data was recorded by an automated data acquisition system. One of the two process heater CEM systems tested failed the initial test due to leaks in the gas conditioning system. Troubleshooting was performed using O_2 analyzers, and the leaking component was identified and replaced. This CEM system met all CEM relative accuracy requirements during the subsequent retest.

Performance Audit of NO_x and SO_2 CEMs at Coal-Fired Power Plant. Lead engineer on system audit and challenge gas performance audit of NO_x and SO_2 CEMs at a coal-fired power plant in southern Nevada. Dynamic and instrument calibration checks were performed on the CEMs. A detailed visual inspection of the CEM system, from the gas sampling probes at the stack to the CEM sample gas outlet tubing in the CEM trailer, was also conducted. The CEMs passed the dynamic and instrument calibration requirements specified in EPA's Performance Specification Test - 2 (NO_x and SO_2) alternative relative accuracy requirements.

AIR ENGINEERING/AIR TESTING PROJECT EXPERIENCE – GENERAL

Reverse Air Fabric Filter Retrofit Evaluation – Coal-Fired Boiler. Lead engineer for upgrade of reverse air fabric filters serving coal-fired industrial boilers. Fluorescent dye injected to pinpoint broken bags and damper leaks. Corrosion of pneumatic actuators serving reverse air valves and inadequate insulation identified as principal causes of degraded performance.

Pulse-Jet Fabric Filter Performance Evaluation – Gold Mine. Lead engineer on upgrade of pulse-jet fabric filter and associated exhaust ventilation system serving an ore-crushing facility at a gold mine. Fluorescent dye used to identify bag collar leaks, and modifications were made to pulse air cycle time and duration. This marginal source was in compliance at 20 percent of emission limit following completion of repair work.

Pulse-Jet Fabric Filter Retrofit - Gypsum Calciner. Lead engineer on upgrade of pulse-jet fabric filter controlling particulate emissions from a gypsum calciner. Recommendations included a modified bag clamping mechanism, modified hopper evacuation valve assembly, and changes to pulse air cycle time and pulse duration.

Wet Scrubber Retrofit – Plating Shop. Project engineer on retrofit evaluation of plating shop packed-bed wet scrubbers failing to meet performance guarantees during acceptance trials, due to excessive mist carryover. Recommendations included relocation of the mist eliminator (ME), substitution of the original chevron blade ME with a mesh pad ME, and use of higher density packing material to improve exhaust gas distribution. Wet scrubbers passed acceptance trials following completion of recommended modifications.

Electrostatic Precipitator (ESP) Retrofit Evaluation – MSW Boiler. Lead engineer for retrofit evaluation of single field ESP on a municipal solid waste (MSW) boiler. Recommendations included addition of automated power controller, inlet duct turning vanes, and improved collecting plate rapping system.

ESP Electric Coil Rapper Vibration Analysis Testing - Coal-Fired Boiler. Lead engineer for evaluation of ESP rapper effectiveness test program on three field ESP equipped with "magnetically induced gravity return" (MIGR) rappers. Accelerometers were placed in a grid pattern on ESP collecting plates to determine maximum instantaneous plate acceleration at a variety of rapper power setpoints. Testing showed that the rappers met performance specification requirements.

Aluminum Remelt Furnace Particulate Emissions Testing. Project manager and lead engineer for high temperature (1,600 ^{o}F) particulate sampling of a natural gas-fired remelt furnace at a major aluminum rolling mill. Objectives of test program were to: 1) determine if condensable particulate was present in stack gases, and 2) to validate the accuracy of the in-stack continuous opacity monitor (COM). Designed and constructed a customized high temperature (inconel) PM_{10}/Mtd 17 sampling assembly for test program. An onsite natural gas-fired boiler was also tested to provide comparative data for the condensable particulate portion of the test program. Test results showed that no significant levels of condensable particulate in the remelt furnace exhaust

gas, and indicated that the remelt furnace and boiler had similar particulate emission rates. Test results also showed that the COM was accurate.

Aluminum Remelt Furnace CO and NO_x Testing. Project manager and lead engineer for continuous week-long testing of CO and NO_x emissions from aluminum remelt furnace. Objective of test program was to characterize CO and NO_x emissions from representative remelt furnace for use in the facility's criteria pollution emissions inventory. A TECO Model 48 CO analyzer and a TECO Model 10 NO_x analyzer were utilized during the test program to provide $\pm$1 ppm measurement accuracy, and all test data was recorded by an automated data acquisition system.

OIL AND GAS PRODUCTION AIR ENGINEERING/TESTING EXPERIENCE

Air Toxics Testing of Oil and Gas Production Sources. Project manager and lead engineer for test plan/test program to determine VOC removal efficiency of packed tower scrubber controlling sulfur dioxide emissions from a crude oil-fired steam generator. Ratfisch 55 VOC analyzers were used to measure the packed tower scrubber VOC removal efficiency. Tedlar bag samples were collected simultaneously to correlate BTX removal efficiency to VOC removal efficiency. This test was one of hundreds of air toxics tests performed during this test program for oil and gas production facilities from 1990 to 1992. The majority of the volatile air toxics analyses were performed at in-house laboratory. Project staff developed thorough familiarity with the applications and limitations of GC/MS, GC/PID, GC/FID, GC/ECD and GC/FPD. Tedlar bags, canisters, sorbent tubes and impingers were used during sampling, along with isokinetic tests methods for multiple metals and PAHs.

Air Toxics Testing of Glycol Reboiler – Gas Processing Plant. Project manager for test program to determine emissions of BTXE from glycol reboiler vent at gas processing facility handling 12 MM/cfd of produced gas. Developed innovative test methods to accurately quantify BTXE emissions in reboiler vent gas.

Air Toxics Emissions Inventory Plan. Lead engineer for the development of generic air toxics emission estimating techniques (EETs) for oil and gas production equipment. This project was performed for the Western States Petroleum Association in response to the requirements of the California Air Toxics "Hot Spots" Act. EETs were developed for all point and fugitive oil and gas production sources of air toxics, and the specific air toxics associated with each source were identified. A pooled source emission test methodology was also developed to moderate the cost of source testing required by the Act.

Fugitive NMHC Emissions from TEOR Production Field. Project manager for the quantification of fugitive Nonmethane hydrocarbon (NMHC) emissions from a thermally enhanced oil recovery (TEOR) oil production field in Kern County, CA. This program included direct measurement of NMHC concentrations in storage tank vapor headspace and the modification of available NMHC emission factors for NMHC-emitting devices in TEOR produced gas service, such as wellheads, vapor trunklines, heat exchangers, and compressors. Modification of the existing NMHC emission factors was necessary due to the high concentration of CO_2 and water vapor in TEOR produced gases.

Fugitive Air Emissions Testing of Oil and Gas Production Fields. Project manager for test plan/test program to determine VOC and air toxics emissions from oil storage tanks, wastewater storage tanks and produced gas lines. Test results were utilized to develop comprehensive air toxics emissions inventories for oil and gas production companies participating in the test program.

Oil and Gas Production Field – Air Emissions Inventory and Air Modeling. Project manager for oil and gas production field risk assessment. Project included review and revision of the existing air toxics emission inventory, air dispersion modeling, and calculation of the acute health risk, chronic non-carcinogenic risk and carcinogenic risk of facility operations. Results indicated that fugitive H_2S emissions from facility operations posed a potential health risk at the facility fenceline.

PETROLEUM REFINERY AIR ENGINEERING/TESTING EXPERIENCE

Criteria and Air Toxic Pollutant Emissions Inventory for Proposed Refinery Modifications. Project manager and technical lead for development of baseline and future refinery air emissions inventories for process modifications required to produce oxygenated gasoline and desulfurized diesel fuel at a California refinery. State of the art criteria and air toxic pollutant emissions inventories for refinery point, fugitive and mobile sources were developed. Point source emissions estimates were generated using onsite criteria pollutant test data, onsite air toxics test data, and the latest air toxics emission factors from the statewide refinery air toxics inventory database. The fugitive volatile organic compound (VOC) emissions inventories were developed using the refinery's most recent inspection and maintenance (I&M) monitoring program test data to develop site-specific component VOC emission rates. These VOC emission rates were combined with speciated air toxics test results for the principal refinery process streams to produce fugitive VOC air toxics emission rates. The environmental impact report (EIR) that utilized this emission inventory data was the first refinery "Clean Fuels" EIR approved in California.

Air Toxic Pollutant Emissions Inventory for Existing Refinery. Project manager and technical lead for air toxic pollutant emissions inventory at major California refinery. Emission factors were developed for refinery heaters, boilers, flares, sulfur recovery units, coker deheading, IC engines, storage tanks, process fugitives, and catalyst regeneration units. Onsite source test results were utilized to characterize emissions from refinery combustion devices. Where representative source test results were not available, AP-42 VOC emission factors were combined with available VOC air toxics speciation profiles to estimate VOC air toxic emission rates. A risk assessment based on this emissions inventory indicated a relatively low health risk associated with refinery operations. Benzene, 1,3-butadiene and PAHs were the principal health risk related pollutants emitted.

Air Toxics Testing of Refinery Combustion Sources. Project manager for comprehensive air toxics testing program at a major California refinery. Metals, Cr^{+6}, PAHs, H_2S and speciated VOC emissions were measured from refinery combustion sources. High temperature Cr^{+6} stack testing using the EPA Cr^{+6} test method was performed for the first time in California during this test program. Representatives from the California Air Resources Board source test team performed simultaneous testing using ARB Method 425 (Cr^{+6}) to compare the results of EPA and ARB Cr^{+6} test methodologies. The ARB approved the test results generated using the high temperature EPA Cr^{+6} test method.

Air Toxics Testing of Refinery Fugitive Sources. Project manager for test program to characterize air toxic fugitive VOC emissions from fifteen distinct process units at major California refinery. Gas, light liquid, and heavy liquid process streams were sampled. BTXE, 1,3-butadiene and propylene concentrations were quantified in gas samples, while BTXE, cresol and phenol concentrations were measured in liquid samples. Test results were combined with AP-42 fugitive VOC emission factors for valves, fittings, compressors, pumps and PRVs to calculate fugitive air toxics VOC emission rates.

LATIN AMERICA ENVIRONMENTAL PROJECT EXPERIENCE

Preliminary Design of Ambient Air Quality Monitoring Network – Lima, Peru. Project leader for project to prepare specifications for a fourteen station ambient air quality monitoring network for the municipality of Lima, Peru. Network includes four complete gaseous pollutant, particulate, and meteorological parameter monitoring stations, as well as eight PM_{10} and TSP monitoring stations.

Evaluation of Proposed Ambient Air Quality Network Modernization Project – Venezuela. Analyzed a plan to modernize and expand the ambient air monitoring network in Venezuela. Project was performed for the U.S. Trade and Development Agency. Direct interaction with policy makers at the Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) in Caracas was a major component of this project.

Evaluation of U.S.-Mexico Border Region Copper Smelter Compliance with Treaty Obligations – Mexico. Project manager and lead engineer to evaluate compliance of U.S. and Mexican border region copper smelters with the SO_2 monitoring, recordkeeping and reporting requirements in Annex IV [Copper Smelters] of

the La Paz Environmental Treaty. Identified potential problems with current ambient and stack monitoring practices that could result in underestimating the impact of SO_2 emissions from some of these copper smelters. Identified additional source types, including hazardous waste incinerators and power plants, that should be considered for inclusion in the La Paz Treaty process.

Development of Air Emission Standards for Petroleum Refinery Equipment - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian petroleum refineries. The sources included in the scope of this project included: 1) SO_2 and NO_x refinery heaters and boilers, 2) desulfurization of crude oil, particulate and SO_2 controls for fluid catalytic cracking units (FCCU), 3) VOC and CO emissions from flares, 4) vapor recovery systems for marine unloading, truck loading, and crude oil/refined products storage tanks, and 5) VOC emissions from process fugitive sources such as pressure relief valves, pumps, compressors and flanges. Proposed emission limits were developed for new and existing refineries based on a thorough evaluation of the available air emission control technologies for the affected refinery sources. Leading vendors of refinery control technology, such as John Zink and Exxon Research, provided estimates of retrofit costs for the largest Peruvian refinery, La Pampilla, located in Lima. Meetings were held in Lima with refinery operators and MEM staff to discuss the proposed emission limits and incorporate mutually agreed upon revisions to the proposed limits for existing Peruvian refineries.

Development of Air Emission Limits for ICE Cogeneration Plant - Panamá. Lead engineer assisting U.S. cogeneration plant developer to permit an ICE cogeneration plant at a hotel/casino complex in Panama. Recommended the use of modified draft World Bank NO_x and PM limits for ICE power plants. The modification consisted of adding a thermal efficiency factor adjustment to the draft World Bank NO_x and PM limits. These proposed ICE emission limits are currently being reviewed by Panamanian environmental authorities.

Mercury Emissions Inventory for Stationary Sources in Northern Mexico. Project manager and lead engineer to estimate mercury emissions from stationary sources in Northern Mexico. Major potential sources of mercury emissions include solid- and liquid-fueled power plants, cement kilns co-firing hazardous waste, and non-ferrous metal smelters. Emission estimates were provided for approximately eighty of these sources located in Northern Mexico. Coordinated efforts of two Mexican subcontractors, located in Mexico City and Hermosillo, to obtain process throughput data for each source included in the inventory.

Translation of U.S. EPA Scrap Tire Combustion Emissions Estimation Document – Mexico. Evaluated the Translated a U.S. EPA scrap tire combustion emissions estimation document from English to Spanish for use by Latin American environmental professionals.

Environmental Audit of Aluminum Production Facilities – Venezuela. Evaluated the capabilities of existing air, wastewater and solid/hazardous waste control systems used by the aluminum industry in eastern Venezuela. This industry will be privatized in the near future. Estimated the cost to bring these control systems into compliance with air, wastewater and solid/hazardous waste standards recently promulgated in Venezuela. Also served as technical translator for team of U.S. environmental engineers involved in the due diligence assessment.

Assessment of Environmental Improvement Projects – Chile and Peru. Evaluated potential air, water, soil remediation and waste recycling projects in Lima, Peru and Santiago, Chile for feasibility study funding by the U.S. Trade and Development Agency. Project required onsite interaction with in-country decisionmakers (in Spanish). Projects recommended for feasibility study funding included: 1) an air quality technical support project for the Santiago, Chile region, and 2) soil remediation/metals recovery projects at two copper mine/smelter sites in Peru.

Air Pollution Control Training Course – Mexico. Conducted two-day Spanish language air quality training course for environmental managers of assembly plants in Mexicali, Mexico. Spanish-language course manual prepared by Powers Engineering. Practical laboratory included training in use of combustion gas analyzer, flame ionization detector (FID), photoionization detector (PID), and occupational sampling.

Renewable Energy Resource Assessment Proposal – Panama. Translated and managed winning bid to evaluate wind energy potential in Panama. Direct interaction with the director of development at the national utility monopoly (IRHE) was a key component of this project.

Comprehensive Air Emissions Testing at Assembly Plant – Mexico. Project manager and field supervisor of emissions testing for particulates, NO_x, SO_2 and CO at turbocharger/air cooler assembly plant in Mexicali, Mexico. Source specific emission rates were developed for each point source at the facility during the test program. Translated test report into Spanish for review by the Mexican federal environmental agency (SEMARNAP).

Air Pollution Control Equipment Retrofit Evaluation – Mexico. Project manager and lead engineer for comprehensive evaluation of air pollution control equipment and industrial ventilation systems in use at assembly plant consisting of four major facilities. Equipment evaluated included fabric filters controlling blast booth emissions, electrostatic precipitator controlling welding fumes, and industrial ventilation systems controlling welding fumes, chemical cleaning tank emissions, and hot combustion gas emissions. Recommendations included modifications to fabric filter cleaning cycle, preventative maintenance program for the electrostatic precipitator, and redesign of the industrial ventilation system exhaust hoods to improve capture efficiency.

Comprehensive Air Emissions Testing at Assembly Plant – Mexico. Project manager and field supervisor of emissions testing for particulates, NO_x, SO_2 and CO at automotive components assembly plant in Acuña, Mexico. Source-specific emission rates were developed for each point source at the facility during the test program. Translated test report into Spanish.

Fluent in Spanish. Studied at the Universidad de Michoacán in Morelia, Mexico, 1993, and at the Colegio de España in Salamanca, Spain, 1987-88. Have lectured (in Spanish) on air monitoring and control equipment at the Instituto Tecnológico de Tijuana. Maintain contact with Comisión Federal de Electricidad engineers responsible for operation of wind and geothermal power plants in Mexico, and am comfortable operating in the Mexican business environment.

PUBLICATIONS

Bill Powers, "*San Diego Smart Energy 2020 – The 21st Century Alternative*," San Diego, October 2007.

Bill Powers, "*Energy, the Environment, and the California – Baja California Border Region*," Electricity Journal, Vol. 18, Issue 6, July 2005, pp. 77-84.

W.E. Powers, *"Peak and Annual Average Energy Efficiency Penalty of Optimized Air-Cooled Condenser on 515 MW Fossil Fuel-Fired Utility Boiler,"* presented at California Energy Commission/Electric Power Research Institute Advanced Cooling Technologies Symposium, Sacramento, California, June 2005.

W.E. Powers, R. Wydrum, P. Morris, *"Design and Performance of Optimized Air-Cooled Condenser at Crockett Cogeneration Plant,"* presented at EPA Symposium on Technologies for Protecting Aquatic Organisms from Cooling Water Intake Structures, Washington, DC, May 2003.

P. Pai, D. Niemi, W.E. Powers, *"A North American Anthropogenic Inventory of Mercury Emissions,"* to be presented at Air & Waste Management Association Annual Conference in Salt Lake City, UT, June 2000.

P.J. Blau and W.E. Powers, *"Control of Hazardous Air Emissions from Secondary Aluminum Casting Furnace Operations Through a Combination of: Upstream Pollution Prevention Measures, Process Modifications and End-of-Pipe Controls,"* presented at 1997 AWMA/EPA Emerging Solutions to VOC & Air Toxics Control Conference, San Diego, CA, February 1997.

W.E. Powers, et. al., *"Hazardous Air Pollutant Emission Inventory for Stationary Sources in Nogales, Sonora, Mexico ,"* presented at 1995 AWMA/EPA Emissions Inventory Specialty Conference, RTP, NC, October 1995.

W.E. Powers, *"Develop of a Parametric Emissions Monitoring System to Predict NO_x Emissions from Industrial Gas Turbines,"* presented at 1995 AWMA Golden West Chapter Air Pollution Control Specialty Conference, Ventura, California, March 1995.

W. E. Powers, et. al., *"Retrofit Control Options for Particulate Emissions from Magnesium Sulfite Recovery Boilers,"* presented at 1992 TAPPI Envr. Conference, April 1992. Published in *TAPPI Journal*, July 1992.

S. S. Parmar, M. Short, W. E. Powers, *"Determination of Total Gaseous Hydrocarbon Emissions from an Aluminum Rolling Mill Using Methods 25, 25A, and an Oxidation Technique,"* presented at U.S. EPA Measurement of Toxic and Related Air Pollutants Conference, May 1992.

N. Meeks, W. E. Powers, *"Air Toxics Emissions from Gas-Fired Internal Combustion Engines,"* presented at AIChE Summer Meeting, August 1990.

W. E. Powers, *"Air Pollution Control of Plating Shop Processes,"* presented at 7th AES/EPA Conference on Pollution Control in the Electroplating Industry, January 1986. Published in *Plating and Surface Finishing* magazine, July 1986.

H. M. Davenport, W. E. Powers, *"Affect of Low Cost Modifications on the Performance of an Undersized Electrostatic Precipitator,"* presented at 79th Air Pollution Control Association Conference, June 1986.

AWARDS

Engineer of the Year, 1991 – ENSR Consulting and Engineering, Camarillo
Engineer of the Year, 1986 – Naval Energy and Environmental Support Activity, Port Hueneme
Productivity Excellence Award, 1985 – U. S. Department of Defense

PATENTS

Sedimentation Chamber for Sizing Acid Mist, Navy Case Number 70094

Bonnie Heeley
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07/08/2010 03:29 PM

To "CAPSSolarNextEraFPL@blm.gov" <CAPSSolarNextEraFPL@blm.gov>
cc
bcc
Subject Genesis Solar Energy Project

Attached in pdf format are CURE's Comments re the Genesis Solar DEIS. Because of the size of the attachments, they will be attached in several subsequent emails. The entire packet of material will be sent via overnight mail. If you encounter problems with the receipt of these emails, please contact Bonnie Heeley at the email address or phone number listed below.

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2364-099a CURE Comments re DEIS - Genesis.pdf

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July 8, 2010

VIA E-MAIL [ORIGINAL TO FOLLOW VIA OVERNIGHT MAIL]

Allison Shaffer, Project Manager
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, CA 92262
Email: CAPSSolarNextEraFPL@blm.gov

Re: CURE's Comments Concerning Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

On behalf of California Unions for Reliable Energy ("CURE"), please accept these comments on the Draft Environmental Impact Statement ("DEIS"), prepared pursuant to the National Environmental Policy Act ("NEPA"),[1] for Genesis Solar, LLC's ("Applicant") proposed 250 MW Genesis Solar Energy Project ("Project"). The Project requires an amendment to the California Desert Conservation Area ("CDCA") Plan, a right-of-way ("ROW") from the Bureau of Land Management ("BLM") to construct, operate and decommission the facility, California Energy Commission ("CEC") certification to construct and operate the facility, a cultural resources Programmatic Agreement ("PA"), and incidental take permits, among other agency actions.

As explained more fully below, the DEIS does not comply with the requirements of NEPA, or the California Environmental Quality Act ("CEQA")[2] for required discretionary approvals by California State agencies. Therefore, BLM may

[1] 42 U.S.C. §§ 4321 et seq. (2010).

[2] Public Resources Code, § 21000 *et seq.*

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not approve the CDCA Plan amendment or ROW until an adequate DEIS is prepared and circulated for public review and comment.

CURE is a coalition of labor unions whose members construct, operate, and maintain power plants throughout California. CURE encourages sustainable development of California's energy and natural resources. Environmental degradation jeopardizes future growth and jobs by causing construction moratoriums, depleting limited air pollutant emissions offsets, consuming limited fresh water resources, and imposing other stresses on the environmental carrying capacity of the state. This in turn reduces future employment opportunities for CURE's members. Additionally, union members live and work in the communities and regions that suffer the impacts of projects that are detrimental to human health and the environment. CURE therefore has a direct interest in enforcing environmental laws to minimize the adverse impacts of projects that would otherwise degrade the environment. Finally, CURE members are concerned about projects that risk serious environmental harm without providing countervailing economic benefits. The NEPA process allows for a balanced consideration of a project's socioeconomic and environmental impacts, and it is in this spirit that we offer these comments.

The BLM and the CEC have prepared a joint Staff Assessment/Draft Environmental Impact Statement for the Project to satisfy the requirements of NEPA and CEQA. We have been informed that the BLM's NEPA document and the CEC's CEQA functional equivalent document are no longer proceeding along a joint track towards completion. These comments are directed toward the BLM's Draft Environmental Impact Statement ("DEIS") document, and the extent to which the analyses comply with the requirements of NEPA.

We have reviewed the DEIS and its technical appendices in conjunction with other studies and materials developed as part of the concurrent review of the Project by BLM and CEC. We have prepared these comments with assistance of technical experts Scott Cashen, Matt Hagemann, Greg Okin, David Marcus, Eric Hendrix, and David Whitley. Their comments and qualifications are appended hereto as Attachment A ("Cashen Comments"), Attachment B ("Hagemann Comments"), Attachment C ("Okin Comments"), Attachment D ("Hendrix comments"), and Attachment E ("Marcus Comments"). We request that you consider and respond to these consultants' comments separately and individually.

I. INTRODUCTION

California is experiencing an unprecedented surge of alternative energy power plant development. As of January 2010, 244 renewable projects have been proposed in California.[3] The DEIS acknowledges that 125 renewable energy projects, with a total overall area of over one million acres, would be scattered throughout the California Desert Conservation Area managed by the BLM.[4] While these plants will employ solar thermal, solar photovoltaic, or wind technology, each one will unavoidably tax the State's limited air, water, land, and biological resources to a potentially significant cumulative extent. The final toll taken by this historic energy boom on California's environment, public health, and natural resource base may not be known for several years or longer, but currently available and substantial evidence shows that the effects will be severe. The public lands managed by the BLM will be similarly taxed. The DEIS for this Project is wholly inadequate because it fails to adequately consider, among other impacts, the cumulative effects in the region that will cause environmental degradation.

This Project, as well as numerous other pending renewable energy projects, seeks funding through the American Recovery and Reinvestment Act of 2009. As recently stated in a proclamation by President Obama, the ARRA "reaffirmed NEPA's role in protecting public health, safety, and environmental quality, and in ensuring transparency, accountability, and public involvement in our Government."[5]

Under these unprecedented circumstances, it is even more imperative that the BLM's environmental document identify and analyze all foreseeable direct, indirect, and cumulative project impacts with the utmost degree of accuracy, care and detail. It is equally if not more imperative that any and all reasonable alternatives that are less environmentally damaging be presented and discussed as thoroughly as possible, together with any and all feasible mitigation measures. The strictures of NEPA and the maxims of sound public policy and informed environmental planning require nothing less. Based on these concerns, CURE and

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[3] DEIS, p. B.3-1; see also Press Release, Office of the Governor, Governor Schwarzenegger Announces 244 Proposed Renewable Energy Projects Throughout the State (Dec. 29, 2009), available at http://gov.ca.gov/press-release/14092/.

[4] *Id.* at p. C.12-35.

[5] Presidential Proclamation regarding the 40th Anniversary of the National Environmental Policy Act, December 31, 2009.

its members have a strong interest in ensuring that this Project complies with all applicable federal, State and local laws and regulations.

With that said, we must conclude that this particular DEIS is so rife with omissions, incomplete analyses, and obsolete information regarding a changing Project that it simply does not even come close to complying with NEPA standards. As these comments will demonstrate, the DEIS is fatally deficient and must be substantially revised and recirculated for further public review and comment before it may be finalized.[6]

As explained at length below, the Project will generate a multitude of impacts in a number of impact areas, including: biological resources, cultural resources, soil and water resources, hazardous materials and waste management. The DEIS either mischaracterizes, misanalyzes, underestimates, or fails to identify many of these impacts. The DEIS, for example, fails entirely to identify the impacts to numerous biological resources that will be caused by the proposed approximately 75-acre Colorado River Substation expansion. Furthermore, many of the mitigation measures described in the DEIS will not in fact mitigate impacts to the extent claimed and in some instances may generate additional impacts that are not evaluated. For example, with respect to significant impacts, the DEIS proposes that the Applicant replace 51,920 acre feet of water that will be pumped from the Colorado River over the life of the Project. However, the DEIS does not identify a replacement water source and thus fails to include an analysis of potential environmental impacts associated with replacing 51,920 acre-feet of water. The DEIS must be revised to resolve these inadequacies and must be recirculated for public review and comment.

II. THE DEIS FAILS TO SATISFY NEPA'S PURPOSE AND GOALS

NEPA requires that agencies take a "hard look" at the environmental consequences of a proposed action.[7] A hard look is defined as a "reasoned analysis

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[6] 40 C.F.R. § 1502.9(a) (2009) ["If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion"].

[7] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989); *Dubois v. U.S. Dep't of Agric.*, 102 F.3d 1273, 1284 (1st. Cir. 1996); see also *South Fork Band Council Of Western Shoshone Of Nevada v. U.S. Dept. of Interior*, 588 F.3d 718, 727 (9th Cir. 2009) ["NEPA requires that a hard look be taken, if possible, *before* the environmentally harmful actions are put into effect"].

containing quantitative or detailed qualitative information."[8] The level of detail must be sufficient to support reasoned conclusions by comparing the amount and the degree of the impact caused by the proposed action and the alternatives.[9] An EIS must provide a "full and fair discussion of significant environmental impacts and shall inform the decision-makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment."[10] "General statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided."[11] "[L]ack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it."[12]

NEPA review makes information on the environmental consequences of a proposed action available to the public, which may then offer its insight to assist the agency's decision-making.[13] An EIS is more than just a disclosure device, however; it is an "action-forcing device" which ensures that NEPA's requirements are infused into the ongoing programs and actions of the federal government.[14] An EIS must provide a full and fair discussion of every significant impact, as well as inform decision-makers and the public of reasonable alternatives which would avoid or minimize adverse impacts.[15] The impacts analysis must include a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.[16] The discussion of impacts must include both "direct and indirect

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[8] BLM, NEPA Handbook, P. 55 (Jan. 2008) ("NEPA Handbook"), available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf.

[9] NEPA Handbook, p. 55; *see also* 40 C.F.R. § 1502.1 (2009).

[10] 40 C.F.R. § 1502.1.

[11] *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir. 1998).

[12] *National Parks & Conservation Association v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001), *abrogated on other grounds by Monsanto Co. v. Geertson Seed Farms*, 2010 WL 2471057, 12 (U.S.) (U.S., 2010) [An injunction should issue only if the traditional four-factor test is satisfied].

[13] *See Robertson*, 490 U.S. at 350; *Dubois*, 102 F.3d at 1284.

[14] 40 C.F.R. § 1502.1.

[15] *Id.*

[16] *Id.* at § 1502.16.

effects (secondary impacts) of a proposed project."[17] The agency need not speculate about all conceivable impacts, but it must evaluate the reasonably foreseeable significant effects of the proposed action.[18] In this context, reasonable foreseeability means that "the impact is sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision."[19]

In addition to a scientifically defensible analysis of project impacts, an EIS must also include a discussion of "appropriate mitigation measures not already included in the proposed action or alternatives."[20] An EIS is not complete unless it contains "a reasonably complete discussion of possible mitigation measures."[21] Mitigation includes "avoiding the impact altogether by not taking a certain action or parts of an action."[22] It also includes "minimizing impacts by limiting the degree or magnitude of the action and its implementation."[23] The mandate to thoroughly evaluate all feasible mitigation measures is critical to NEPA's purposes.[24] Hence, a "perfunctory description" or a "mere listing" of possible mitigation measures is not adequate to satisfy NEPA's requirements.[25] That individual harms are somewhat uncertain due to limited understanding of the Project characteristics and baseline conditions does not relieve BLM of the responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset.[26]

Finally, an EIS should be "concise, clear, to the point, and supported by evidence that the agency has made the necessary environmental analyses."[27] A concise and clear EIS that is supported by evidence ensures that federal agencies

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[17] *Id.* at § 1502.16(b); *see also Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992).

[18] *Sierra Club v. Marsh*, 976 F.2d at 767.

[19] *Id; see also Dubois v. Dept. of Agriculture*, 102 F.3d 1273, 1286 (1st Cir. 1996).

[20] 40 C.F.R. § 1502.14(f).

[21] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).

[22] 40 C.F.R. § 1508.20(a).

[23] *Id.* at subd. (b).

[24] *Id.* at § 1500.1(c).)

[25] *Neighbors of Cuddy Mountain*, 137 F.3d at 1380; *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998).

[26] *See South Fork Band Council of Western Shoshone of Nevada*, 588 F.3d at 727, citing *National Parks*, 241 F.3d at 733.

[27] *Id.*

are informed of environmental consequences ***before*** making decisions and that the information is available to the public.[28] As the Council on Environmental Quality ("CEQ") explains in its regulations, "[e]nvironmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."[29]

The DEIS for the proposed Project fails to comply with these basic requirements. The DEIS fails to accurately and completely describe the Project. In addition, the BLM failed to take a hard look at all of the Project's impacts. The DEIS also fails to adequately mitigate the Project's significant adverse impacts. As a result, the DEIS precludes a meaningful analysis of the Project, and the BLM must revise and recirculate the DEIS for public review and comment before making a decision.

III. THE DEIS FAILS AS AN INFORMATIONAL DOCUMENT

The purpose of NEPA is to ensure that every federal agency prepares an EIS for major federal actions significantly affecting the quality of the human environment.[30] An EIS must provide a "full and fair discussion of significant environmental impacts and shall inform the decision-makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment."[31]

The DEIS fails to address the magnitude of the impacts that will be posed by this Project on public lands in the fragile desert environment. The Project's disturbance of 1,800 acres of desert lands will dramatically impact every aspect of the ecosystem on the Project site and surrounding area. Many of these impacts were not identified, disclosed, analyzed or mitigated in the DEIS.

For example, the Project would potentially result in direct, indirect and cumulative effects on numerous special-status plants, including BLM sensitive species.[32] However, because the Applicant has not conducted adequate surveys for

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[28] *Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 758 (9th Cir. 1996).

[29] 40 C.F.R. § 1502.2(g).

[30] 42 U.S.C. § 4332; 40 C.F.R. § 1501.

[31] 40 C.F.R. § 1502.1.

[32] DEIS, p. C.2-3.

these species (and will not conduct them until the fall), the DEIS fails to adequately analyze and mitigate impacts to these species. Similarly, the Project could result in significant impacts to the golden eagle, a species protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.[33] However, because the Applicant conducted golden eagle surveys ***after*** the DEIS was published, the DEIS fails to adequately analyze impacts to golden eagles and the DEIS' mitigation strategy for reducing any impacts to less than significant is completely inadequate. Additionally, the Project will adversely affect hundreds of cultural resources including prehistoric trails and other ethnographic resources. The DEIS fails to adequately analyze impacts to ethnographic resources and provides ***no*** mitigation for impacts to cultural resources. Instead, the DEIS explains that a future consultation process would work out the details of a mitigation proposal – a process that clearly violates the basic tenets of NEPA.

Many of these significant environmental resources on the Project site are irreplaceable. Once these resources are destroyed, they will be lost forever. The DEIS fails as an informational document because it does not adequately describe many of these resources. The DEIS fails to establish the Project setting, it does not fully and fairly describe the proposed action, it wholly omits discussion of a number of potentially significant environmental impacts, and it fails to adequately mitigate the Project's adverse impacts. As described below, the DEIS must be revised to fully describe the Project setting, the Project, the impacts from the Project, and mitigation. Once the DEIS' inadequacies are rectified, the revised DEIS must be circulated for public review and comment, as required by NEPA.

IV. THE DEIS MUST ACCURATELY DESCRIBE THE PROPOSED ACTION

A complete and consistent description of the proposed action is necessary for the public and decision makers to understand the effects of the proposed action.[34] A clear description results in more focused and meaningful public input and BLM participation, a more complete identification of issues, development of reasonable

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[33] *Id.*, p. C.2-5.

[34] *See* 40 C.F.R. § 1502.15; *see also State of Cal. v. Block*, 690 F.2d 753. 761 (9th Cir. 1982) [starting point for analysis of whether a "critical decision" with respect to site development is "to describe accurately the 'federal action' being taken"].

alternatives, sound analysis and interpretation of effects, focused analysis and a sound and supportable decision.[35]

It follows that information in the DEIS that is incomplete and/or inaccurate will skew the environmental consequences analysis and prevent informed public input. Courts have held that "[w]here the information in the initial EIS was so incomplete or misleading that the decisionmaker and the public could not make an informed comparison of the alternatives, revision of an EIS [was] necessary to provide a reasonable, good faith, and objective presentation of the subjects required by NEPA."[36]

Major Federal actions include not only those actions undertaken by federal agencies, but also "actions with effects that may be major and which are potentially subject to Federal control and responsibility."[37] This includes "projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies . . . ."[38] Thus, when evaluating a project's environmental impacts under NEPA, a federal agency must consider the entire project. "Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement."[39] This principle was established early in the development of NEPA law, and applies even when the federal involvement is limited to approving a relatively small aspect of the project.[40]

Further, the DEIS must address closely related "connected actions," as well as similar actions and cumulative actions.[41] Under NEPA, actions are connected if they:

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[35] NEPA Handbook pp. 42-45.

[36] *Natural Res. Def. Council v. U.S. Forest Serv.*, 421 F.3d 797, 811 (9th Cir. 2005), citing *Animal Def. Council v. Hodel*, 840 F.2d 1432, 1439 (9th Cir. 1988).

[37] 40 C.F.R. § 1508.18.

[38] *Id.* at § 1508.18, subd. (a).

[39] *Id.* at § 1502.4, subd. (a).

[40] *E.g., Maryland Conservation Council, Inc. v. Gilchrist*, 808 F.2d 1039, 1042 (4th Cir. 1986); *Sierra Club v. Hodel*, 544 F.2d 1036, 1040-41 (9th Cir. 1976); *Cady v. Morton*, 527 F.2d 786, 795 (9th Cir. 1975).

[41] 40 CFR §1508.25(a).

(i) Automatically trigger other actions which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification.[42]

The DEIS completely fails to identify and analyze impacts related to the following Project components and connected actions: (1) the Colorado River Substation expansion; (2) a secondary access road; (3) a distribution / telecommunications line; (4) a secondary telecommunications line; and (5) a six-pole transmission line extension. These components are necessary parts of the Project and must be analyzed as part of the Project. The DEIS must be revised to consider these Project components and connected actions, and recirculated for public review and comment.

V. THE DEIS FAILS TO ADEQUATELY DESCRIBE THE AREA AFFECTED BY THE PROPOSED ACTION

The BLM must analyze the Project's impacts on the affected environment.[43] This process begins by describing "the present condition of the affected resources within the identified geographic scope" and by providing "a baseline for cumulative effects analysis."[44]

Once a project begins, the "pre-project environment" becomes a thing of the past, thereby making evaluation of the project's effect on pre-project resources impossible.[45] Without establishing the baseline conditions which exist in the vicinity of the proposed Project before it is built, there is simply no way to determine what effect the proposed large-scale solar facility will have on the environment and, consequently, no way to comply with NEPA.[46]

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[42] 40 CFR §1508.25(a)(1).

[43] NEPA Handbook, p. 53.

[44] *Id.*

[45] *Half Moon Bay Fishermans' Marketing Ass'n v. Carlucci* 857 F.2d 505, 510 (9th Cir. 1988), citing *LaFlamme v. FERC*, 842 F.2d 1063, 1071 (9th Cir. 1988)

[46] *Id.*

An accurate description of the affected environment is an essential prerequisite for an adequate analysis of Project impacts. For example, information on the type(s) and level(s) of habitat disturbance in the Project area is necessary to make inferences about the presence, abundance, and distribution of the special-status species that may be impacted by the Project. Here, however, baseline information was collected ***after*** release of the DEIS, and in some cases baseline information is ***yet to be collected***.

A. The DEIS Fails to Adequately Describe the Area Affected for Rare Plants

The DEIS fails to adequately describe the area affected by the proposed action for numerous rare plant species. The DEIS explains that the Applicant's rare plant survey effort does not provide an adequate basis for determining significant impacts to rare plants on the Project's impact area.[47] The DEIS makes clear that the Applicant ***failed to conduct surveys for these rare plant species during the appropriate time of year***.[48] Therefore, the Applicant must complete late-summer/early-fall floristic surveys in order to establish the environmental baseline for the Project site.

Although the DEIS attempts to analyze the potentially significant impacts and formulate mitigation measures for these species, this analysis may bear little resemblance to the analysis and mitigation that will be required after significant impacts to rare plants are actually identified through an adequate survey effort. Hence, the DEIS fails to provide an adequate description of the area affected, analysis and identification of mitigation for these rare plants. Once the Applicant submits the results of the late-summer/early-fall rare plant surveys and all parties have an opportunity to review this analysis, the DEIS must be revised and recirculated for public review and comment.

B. The DEIS Fails to Adequately Describe the Area Affected for Golden Eagles

The DEIS also fails to adequately describe the affected environment for the golden eagle because the Applicant did not provide sufficient information on the

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[47] DEIS, p. C.2-88.

[48] *Id.* (emphasis added).

affected environment for the golden eagle to BLM. The DEIS acknowledges that the Project may "take" golden eagles, requiring a permit from the U.S. Fish and Wildlife Service ("USFWS"), pursuant to the Bald and Golden Eagle Protection Act. However, the DEIS finds that the Applicant ***failed to conduct focused spring surveys*** for golden eagle nest sites or breeding pairs ***and failed to assess whether the Project site is used by wintering golden eagles.***

USFWS recommended that the Applicant conduct nest surveys for the golden eagle in the spring of 2010.[49] The Applicant recently submitted the results of its surveys.[50] The surveys identified golden eagle nests and territories within 10 miles of the Project site.[51] However, importantly, the surveys occurred after release of the DEIS. Consequently, the DEIS does not include an adequate analysis of impacts to golden eagles.

Since the Applicant also failed to assess whether the Project site is used by wintering golden eagles, this information also must be provided in order to establish an accurate baseline.

Although the DEIS attempts to analyze the potentially significant impacts and formulate mitigation measures for the golden eagle, this analysis may bear little resemblance to the analysis and mitigation that will be required after considering the survey results. Hence, the DEIS fails to provide an adequate description of the affected environment, analysis and identification of mitigation for the golden eagle. The DEIS must be revised to include the survey results and an analysis of the Project's impacts on golden eagles, and recirculated for public review and comment.

C. The DEIS Fails to Adequately Describe the Area Affected for Couch's Spadefoot Toad

The DEIS did not adequately describe the affected area for Couch's spadefoot toad, a BLM sensitive species, because the Applicant failed to provide sufficient

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[49] *Id.*, p. C.2-81.

[50] *See* Golden Eagle Risk Assessment for the Genesis Solar Energy Project, June 2010; and Golden Eagle Surveys Surrounding Four Proposed Solar Developments in Eastern Mojave Desert, Riverside and San Bernardino Counties, California, June 22, 2010.

[51] Golden Eagle Risk Assessment for the Genesis Solar Energy Project, June 2010. p. 5.

information on Couch's spadefoot toads to enable BLM to determine significant impacts under NEPA. The DEIS states that the Applicant's ***surveys for Couch's spadefoot toads "were not conducted during the proper season*** (i.e., after summer rains)."[52] Thus, the DEIS requires additional surveys to identify potential spadefoot toad breeding habitat.[53]

Although the DEIS attempts to analyze the impacts and formulate mitigation measures for Couch's spadefoot toad, this analysis may bear little resemblance to the analysis and mitigation that will be required after significant impacts to Couch's spadefoot toads are actually identified through an adequate survey effort. Hence, the DEIS fails to provide an adequate description of the affected environment, analysis and identification of mitigation for Couch's spadefoot toad. Once the Applicant submits the results of the surveys and all parties have an opportunity to review this analysis, the DEIS must be revised and recirculated for public review and comment.

In sum, without adequate pre-Project site surveys, the DEIS does not and cannot contain accurate or reliable analyses of the Project's significant impacts to biological resources. Surveys for special-status plants, golden eagle, and Couch's spadefoot toad are required in order to establish the potentially affected existing biological resources in the Project area and to enable an adequate analysis of impacts on these resources. Surveys must be conducted and survey results considered prior to the approval of the Project so that the public and decision-makers will have an accurate picture of the biological resources that will be impacted. Only after these surveys are complete and the results included in the DEIS, can the DEIS adequately describe the affected environment, and analyze and identify mitigation measures for special-status plants, golden eagle, and Couch's spadefoot toad.

VI. THE DEIS MUST DISCLOSE, ANALYZE AND MITIGATE ALL POTENTIALLY SIGNIFICANT IMPACTS OF THE PROJECT

The environmental consequences of a proposed action must be described in the DEIS. NEPA regulations require that this section of an EIS describe any direct, indirect and cumulative adverse environmental effects which cannot be avoided

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[52] *Id.*, p. C.2-36 (emphasis added).

[53] *Id.*, p. C.2-78.

should the proposal be implemented; the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.[54] The DEIS must also describe possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.[55]

The DEIS does not consider all of the Project's significant and foreseeable environmental impacts to biological resources, water resources, transmission systems, hazards, waste, and cultural resources, among others. The BLM's failure to take a hard look at the Project's impacts violates the basic requirements of NEPA. The BLM must revise its impacts analysis and issue a substantially revised or supplemental DEIS for public review and comment.

A. The DEIS Must Disclose, Analyze and Mitigate All Potentially Significant Impacts to Biological Resources

1. Golden Eagles

The golden eagle is protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The USFWS requires a take permit to be issued for "take" of bald or golden eagles where the taking is associated with, but not the purpose of, the activity, and cannot be practicably avoided.[56] Take includes causing a decrease in golden eagle productivity by substantially interfering with normal breeding, feeding, or sheltering behavior.[57]

The DEIS recognizes that although it attempted to analyze impacts to the golden eagle, results from surveys may alter its analysis.[58] As explained above, the DEIS acknowledges that the Project may "take" golden eagles, requiring a permit

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[54] 40 C.F.R. § 1502.16.

[55] *Id.*

[56] U.S. Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take. Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior.

[57] *Id.*

[58] *Id.*, p. C.2-5.

from the USFWS, pursuant to the Bald and Golden Eagle Protection Act. However, the DEIS finds that the Applicant failed to conduct focused spring surveys for golden eagle nest sites or breeding pairs and failed to assess whether the Project site is used by wintering golden eagles. Therefore, the DEIS does not include an adequate analysis of potentially significant impacts to golden eagles. Although the DEIS attempts to analyze the impacts and formulate mitigation measures for the golden eagle, this analysis may bear little resemblance to the analysis (and mitigation) that will be required after significant impacts to golden eagles are assessed based on survey data. Hence, the DEIS fails to provide an adequate analysis and identification of mitigation for the golden eagle.

2. Special-Status Plants

The DEIS fails to adequately analyze impacts to special-status plants. As explained above, the DEIS concludes that the Applicant's rare plant survey effort does not provide an adequate basis for determining impacts to rare plants on the Project's impact area.[59] The DEIS makes clear that the Applicant failed to conduct surveys for these rare plant species during the appropriate time of year.[60] Therefore, the Applicant must complete late-summer/early-fall floristic surveys in order to establish the environmental baseline for the Project site. Although the DEIS attempts to analyze the impacts and formulate mitigation measures for these species, this analysis may bear little resemblance to the analysis and mitigation that will be required after significant impacts to rare plants are actually identified through an adequate survey effort. Hence, the DEIS fails to provide an adequate analysis and identification of mitigation for rare plants.

In addition, the DEIS completely fails to address offsite impacts to special-status plants that may result from the Project's influence on increased aeolian activity. As explained in expert Okin's attached comments, sand blown from the Project disturbance area may be deposited downwind of the Project, potentially burying plants. The sand can damage or kill plants and can also lower the water-holding capacity, cation-exchange capacity, and critical nutrient elements in the soil. The DEIS must be revised to analyze, disclose and mitigate potentially significant impacts to plants as a result of increased and changed aeolian sand transport.

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[59] DEIS, p. C.2-88.

[60] *Id.*

3. Couch's Spadefoot Toad

The DEIS does not provide an adequate analysis of impacts to Couch's spadefoot toad. As explained above, the DEIS states that the Applicant's surveys for Couch's spadefoot toads "were not conducted during the proper season (i.e., after summer rains)."[61] Thus, the DEIS requires additional surveys to identify potential spadefoot toad breeding habitat.[62] Although the DEIS attempts to analyze the impacts and formulate mitigation measures for Couch's spadefoot toad, this analysis may bear little resemblance to the analysis and mitigation that will be required after significant impacts to Couch's spadefoot toad are actually identified through an adequate survey effort. In fact, condition of certification BIO-27 requires the Applicant, as part of the Couch's Spadefoot Toad Protection and Mitigation Plan, to perform an impact assessment after it conducts its surveys.[63] BIO-27 requires that the analysis include an assessment of impacts from habitat disturbance and noise from construction, noise from operation of the Project, increased traffic and vehicle access, changes in flow levels and patterns to breeding ponds, and increased risk of predation.[64] However, NEPA requires that the BLM include the analysis outlined in BIO-27 in a revised DEIS, not in a mitigation plan that will be provided by the Applicant after Project approval.[65] Thus, the DEIS failed to provide an adequate analysis and identification of mitigation for Couch's spadefoot toad.

4. Gila Woodpecker

The DEIS fails to provide an adequate analysis of impacts to the Gila woodpecker, a California endangered species. The DEIS concludes that the Gila woodpecker is not expected to occur on the Project site because (1) Gila woodpeckers are only known from the Colorado River, and (2) the Project site does not contain suitable nesting habitat, and (3) the closest CNDDB record is a 1986 record east of the Project site at the Colorado River.[66] As discussed in expert Cashen's comments,

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[61] *Id.*, p. C.2-36.

[62] *Id.*, p. C.2-78.

[63] *Id.*, pp. C.2-202-203.

[64] *Id.*, p. C.2-203.

[65] *Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 758 (9th Cir. 1996).

[66] DEIS, p. C.2-54.

the DEIS fails to accurately account the range and nesting habitat of the Gila woodpecker. In addition, Cashen points out that the DEIS has misused the California Natural Diversity Database ("CNDDB").[67]

Gila woodpeckers have been discovered at several locations west of the Colorado River and documented in the CNDDB[68] and the Desert Bird Conservation Plan. Also, several studies and surveys have documented Gila woodpeckers breeding in dry desert wash woodlands such as those that occur in the Project area. Thus, the Gila woodpecker has the potential to occur on and around the Project site. Without appropriate mitigation, the Project may cause a significant impact on the species and its habitat.

5. Special-Status Bats

The DEIS concludes that the Project will contribute substantially to the cumulative loss of land in the NECO planning area's biological resources, including habitat for special-status bats. The DEIS proposes to mitigate impacts to special-status bats via compensatory mitigation lands purchased for impacts to desert tortoise and state waters. However, such lands would not necessarily offset the cumulative loss of habitat for special-status bats. Specifically, roosting opportunities for bats are available in tree cavities, soil crevices and rock outcroppings. The DEIS, however, does not require that compensation lands purchased for impacts to desert tortoise and state waters contain roosting habitat for special-status bats. As a result, the DEIS cannot conclude that the proposed mitigation would reduce impacts to special-status bats to below a level of significance.

6. American Badger and Kit Fox

The DEIS concludes that the Project would substantially contribute to the cumulative loss of the NECO planning area's biological resources, including American badgers and kit fox. Specifically, the Project would permanently remove

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[67] CalPIF (California Partners in Flight). 2009. Version 1.0. The Desert Bird Conservation Plan: a Strategy for Protecting and Managing Desert Habitats and Associated Birds in California. California Partners in Flight. http://www.prbo.org/calpif/plans.html.

[68] California Natural Diversity Database. 2009. Rarefind [computer program]. Version 3.1.0. Mar 2, 2010. Sacramento (CA): Wildlife & Habitat Data Analysis Branch. California Department of Fish and Game.

approximately 1,800 acres of foraging and denning habitat for these species and would fragment and reduce the value of foraging and denning habitat adjacent to the Project site. However, the DEIS states that proposed mitigation measures ***may*** – not ***will*** – offset the loss of habitat and reduce the Project impacts to below a level of significance. Thus, impacts to American badger and kit fox remain significant and unmitigated.

7. Birds

The DEIS concludes that Project noise levels up to 60 dBA would not cause significant impacts to nesting birds. However, as Cashen discusses in his comments, research shows that noise levels as low as 36 dBA significantly impact the density of bird populations. Thus, the DEIS' conclusion is unsupported. The DEIS must be revised to disclose, analyze and mitigate potentially significant impacts to nesting birds from Project noise.

8. Nelson's Bighorn Sheep

The DEIS concludes that the Project will not significantly impact Nelson's bighorn sheep habitat connectivity or foraging because of a lack of sign of Nelson's bighorn sheep during the Applicant's field surveys and because the Project is not located within known bighorn sheep corridors as identified in the NECO Plan. These reasons are not sufficient.

According to expert Cashen, bighorn sheep unpredictably use habitat and, even when present, are difficult to observe. Further, although sign may be used to identify presence, it is difficult to detect sign in wind, rain or human disturbance. This is clearly illustrated by expert Cashen's own bighorn sheep study. Cashen observed bighorn sheep sign during one week of his study, but following a rain event, there was no sign at the very same location. Because the Applicant's surveys of the Project site were conducted within a very narrow timeframe during the spring of 2009, chance alone would dictate a low probability of bighorn sheep detection, even if animals use the site.

Also, without supporting information, there is little meaning to the DEIS' statement that the Project is not located within a *known* bighorn sheep corridor as identified in the NECO Plan. According to the NECO Plan, the corridors were

mapped during a NECO workshop in 1997.[69] Additionally, BLM indicated that the habitat modeling procedures used for the NECO Plan are inferior in accuracy to ground-based and field-verified delineation of habitats. As a result, the NECO Plan is not evidence that the Project will not significantly impact bighorn sheep.

Furthermore, the conclusion presented in the DEIS conflicts with the Applicant's conclusion regarding the Project's impacts to bighorn sheep. The Applicant concluded that the cumulative development of foreseeable projects would result in large-scale habitat loss and fragmentation that would potentially cause significant cumulative impacts to biological resources, including bighorn sheep.[70]

The DEIS' conclusion that the Project will not significantly impact Nelson's bighorn sheep is unsupported. The DEIS must be revised to adequately evaluate and disclose impacts to bighorn sheep and provide appropriate mitigation for any impacts.

9. Groundwater Dependent Vegetation

Because there is great uncertainty regarding the Project's impacts on groundwater levels, and therefore uncertainty related to the Project's impacts on groundwater dependent vegetation, the DEIS requires the Applicant to prepare and implement a groundwater dependent vegetation monitoring plan. If monitoring reveals impacts to groundwater dependent vegetation, the DEIS requires the Applicant to take "remedial action." However, the remedial action fails to address landscape-level ecological disturbances associated with water shortages, and is therefore insufficient mitigation.

As explained in Cashen's comments, desert ironwood and palo verde are extremely important groundwater-dependent keystone species with multiple ecological roles. These species constitute much of the desert dry wash woodland identified within the Project impact zone. If the Project causes death to these groundwater dependent vegetation communities, there will be significant indirect impacts to numerous species in the Project area's ecosystem. However, the DEIS fails to provide mitigation for the lost ecological functions and values provided by

[69] BLM and CDFG. 2002. Final Environmental Impact Statement. Proposed Northern & Eastern Colorado Desert Coordinated Management Plan. Bureau of Land Management, California Desert, Riverside, CA, Appendix H.

[70] AFC, p. 5.3-33.

groundwater dependent vegetation communities. The DEIS must be revised to provide mitigation for the Project's indirect impacts to biological resources that may result from mortality of groundwater dependent vegetation.

10. Mojave Fringe-Toed Lizard

Cumulative impacts to the Mojave fringe-toed lizard ("MFTL") would surely occur as a consequence of building the eight currently proposed solar projects in the Project vicinity. The DEIS acknowledges that these cumulative impacts would be significant, but it fails to acknowledge the extent of these impacts and the Project's contribution to them. The analysis of the Project's contribution to cumulative impacts must be revised to specifically address the cumulative impacts that will occur as a consequence of approving numerous immense solar projects within a confined geographic area.

The discussion of pending projects that may disturb dune-dependant species including the MFTL appears to ignore the large projects proposed by enXco adjacent to the Project (CACA 49489 and CACA 49488). According to information provided by the BLM, these two projects alone will occupy approximately 17,415 acres of what appears to be predominantly dune habitat.[71] The analysis also appears to underestimate the amount of acres the First Solar Desert Sunlight project will impact. While the DEIS states that this project will occupy only 5,119 acres, other documents produced by the BLM state that this Project will occupy 14,905 acres.[72] The DEIS must be revised to address the Project's contribution to cumulative impacts to MFTL habitat.

11. Desert Tortoise

a. The DEIS Fails to Disclose BLM's Consultation and Potential Permit Under the Endangered Species Act for the Desert Tortoise

Section 7(a)(2) of the federal Endangered Species Act prohibits agency action that is "likely to jeopardize the continued existence" of any endangered or threatened species or "result in the destruction or adverse modification" of its

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[71] *See* First-In-Line Solar Applications, dated December 21, 2009, available at http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/solar.Par.45875.File.dat/Renew_Energy_2_09_solar.pdf (as of June 24, 2010).

[72] *Compare Id. with* DEIS, p. C.2-115.

critical habitat.[73] To "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."[74] An action is "jeopardizing" if it keeps recovery "far out of reach," even if the species is able to cling to survival.[75] Thus, "an agency may not take action that will tip a species from a state of precarious survival into a state of likely extinction. Likewise, even where baseline conditions already jeopardize a species, an agency may not take action that deepens the jeopardy by causing additional harm."[76] To satisfy this obligation, the federal agency undertaking the action (here, the BLM) must prepare a "biological assessment" that evaluates the action's potential impacts on species and species' habitat.[77]

If the proposed action "is likely to adversely affect" a threatened or endangered species or adversely modify its designated critical habitat, the BLM must engage in "formal consultation" with the USFWS to obtain its biological opinion as to the impacts of the proposed action on the listed species.[78] Once the consultation process has been completed, USFWS must give the BLM a written biological opinion "setting forth [USFWS's] opinion, and a summary of the information on which the opinion is based, detailing how the agency action affects the species or its critical habitat."[79]

If USFWS determines that jeopardy, destruction or adverse modification of critical habitat is likely, USFWS "shall suggest those reasonable and prudent alternatives which [it] believes would not violate subsection (a)(2) of this section and can be taken by the Federal agency or applicant in implementing the agency

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[73] 16 U.S.C. § 1536(a)(2).

[74] 50 C.F .R. § 402.02; *see also Nat'l Wildlife Fed'n v. NMFS*, 524 F.3d 917 (9th Cir. 2008) (*NWF v. NMFS II*) [rejecting agency interpretation of 50 C.F.R. § 402.02 that in effect limited jeopardy analysis to survival and did not realistically evaluate recovery, thereby avoiding an interpretation that reads the provision "and recovery" entirely out of the text].

[75] *NWF v. NMFS II, supra*, 524 F.3d at 931.

[76] *Id.* at 930.

[77] 16 U.S.C. § 1536(c); 50 C.F.R. § 402.12(a).

[78] 16 U.S.C. § 1536(a)(2), (b)(3); *see also* 50 C.F.R. § 402.14(a), (g).

[79] 16 U.S.C. § 1536(b)(3)(A); *see also* 50 C.F.R. § 402.14(h).

action."[80] "Following the issuance of a 'jeopardy' opinion, the [BLM] must either terminate the action, implement the proposed alternative, or seek an exemption from the Cabinet-level Endangered Species Committee pursuant to 16 U.S.C. § 1536(e)."[81]

b. *The DEIS fails to disclose Section 7 Consultation*

The DEIS fails to disclose the details of BLM's required consultation under the ESA with the USFWS for the federally and State threatened desert tortoise.[82] The DEIS also fails to analyze the USFWS's potential issuance of a biological opinion and incidental take permit under Section 7 of the ESA. Therefore, the DEIS is wholly inadequate. The BLM must disclose and analyze these activities in a revised DEIS that is circulated to the public for review and comment.

The ESA prohibits "take" of threatened and endangered species.[83] "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."[84] "Harm" includes "the destruction or adverse modification of habitat resulting in potential injury to a species, including injury from impairment of essential behavioral patterns, such as breeding, feeding or sheltering."[85] Under ESA Section 7, a federal agency must initiate consultation with the USFWS "at the earliest possible time" whenever the agency proposes to undertake an action that "may affect" a listed species or species' critical habitat.[86] If a "may affect" determination is made, which is certain for the proposed Project, then the USFWS must develop and issue a biological opinion containing terms and conditions to ensure that the activities are not likely to jeopardize protected species.[87] Furthermore, USFWS's issuance of a biological opinion requires environmental review under NEPA.

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[80] 16 U.S.C. § 1536(b)(3)(A).

[81] *National Ass'n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 652 (2008).

[82] See, e.g., DEIS, p. C.2-148 [describing BO requirement].

[83] 16 U.S.C. § 1538 (2010).

[84] 16 U.S.C. § 1532(19).

[85] 50 C.F.R. § 17.3 (2009).

[86] 50 C.F.R. § 402.14(a).

[87] *See* 16 U.S.C. § 1536.

Here, the DEIS recognizes that the Project will result in significant impacts to federally protected tortoises. However, there is no indication in the DEIS or its appendices that the BLM has initiated consultation under Section 7 of the ESA, or that the DEIS reviews the environmental effects of the USFWS's issuance of a biological opinion and incidental take permit.

The Project would result in significant direct, indirect and cumulative impacts to the desert tortoise.[88] Specifically, the Project will result in the potential take of individual desert tortoises during Project construction and operation, and will cause a permanent loss of approximately 1,800 acres of desert tortoise habitat.[89] The Project will also increase the risk of desert tortoise predation from ravens, coyotes and feral dogs, and will increase disturbance of desert tortoise from Project noise and lighting. Tortoises could be susceptible to mortality from collisions with vehicles entering and leaving the site.[90] In addition, the spread of invasive plant species on the site would cause an indirect loss to foraging habitat.[91]

Because the Project will clearly impact the desert tortoise, the BLM must undertake Section 7 consultation. The DEIS acknowledges that the BLM must initiate consultation with the USFWS, but it does not describe the status of such consultation and it fails to confirm that all terms and conditions associated with these consultations would be implemented. In addition, the DEIS fails to disclose any of the terms and conditions the USFWS and CDFG would require the Applicant to implement.

In sum, the DEIS must disclose the status of BLM consultation with the USFWS and must incorporate the terms and conditions imposed by the USFWS. Without this information, it is impossible for the public to meaningfully assess the environmental effects and mitigation for impacts to the desert tortoise. Furthermore, without full public disclosure and opportunity for comment, USFWS will be required to conduct further environmental review under NEPA.

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[88] DEIS, p. C.2-62.

[89] *Id.*

[90] *Id.*

[91] *Id.*

B. The DEIS Must Disclose, Analyze and Mitigate All Potentially Significant Impacts to Cultural Resources

Section 101 of NEPA declares it is a matter of national policy to preserve important historic, cultural, and natural aspects of our national heritage. Policy direction in BLM Manual 8100, section 8110.05D, further provides that BLM should "[i]ncorporate cultural resource considerations into all aspects of planning and decision making."

Further, under Section 106 of the National Historic Preservation Act, the BLM has responsibility to consult with tribes and other parties to ensure that these impacts are identified as early as possible. Consultation must provide Indian tribes a reasonable opportunity to identify concerns about historic properties, advise on the identification of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of such effects.[92]

The DEIS acknowledges that McCoy Spring may be a traditional cultural property, and therefore the Project may have a significant impact on "the integrity of association, setting, and feeling of this resource."[93] However, the DEIS does not include an ***analysis*** of the Project's potentially significant impacts to McCoy Spring. Rather, the DEIS states that a determination on the issue will be included in a final EIS, along with any necessary mitigation measures, because possible impacts must be considered from the perspective of Native Americans.[94] The analysis must be performed and included in a revised DEIS that is circulated for public review and comment.

The DEIS also entirely fails to address cumulative impacts to cultural resources. The DEIS states that it did not include a cumulative impact analysis for cultural resources because the data compilation is incomplete.[95] The DEIS fails to comply with the requirements of NEPA. The DEIS must be revised to include an analysis of cumulative impacts to cultural resources, and recirculated for public

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[92] 36 C.F.R. § 800.2.

[93] *Id.*, p. C.3-121.

[94] *Id.*

[95] *Id.*, p. C.3-124.

review and comment. A cumulative impact analysis is particularly critical considering the numerous solar power plant projects proposed on culturally rich sites along the I-10 corridor.

C. The DEIS Must Disclose, Analyze and Mitigate Significant Impacts Associated with Hazardous Materials and Waste Management

1. The DEIS Fails to Adequately Disclose, Analyze and Mitigate Reasonably Foreseeable Spills of HTF

Project operation requires the use of 2,000,000 gallons of Therminol VP-1 heat transfer fluid ("HTF), a known hazardous substance. As Hagemann notes in his comments, this is the same HTF used at other solar power plants in Kramer Junction, California. Past HTF spills at the Kramer Junction plants have generated significant amounts of contaminated soil and liquid waste. For example, in 2007, a spill of 30,000 gallons of HTF generated 6,408 cubic yards of contaminated soil. Yet, the DEIS, with ***no supporting evidence***, states that on average 750 cubic yards of HTF-contaminated soil may be treated per year. The DEIS grossly underestimates (and therefore fails to adequately analyze and mitigate) potentially significant impacts from reasonably foreseeable spills of HTF. The DEIS must be revised to correct this substantial oversight.

Further, the DEIS fails to ensure that impacts from HTF spills will be reduced to a less than significant level. The DEIS provides ***no*** specific measures to properly manage or dispose of hazardous substances, materials or wastes which in some cases may involve several thousands of gallons of HTF. The DEIS also does not establish the concentration of HTF-contaminated soils that would constitute hazardous waste. Thus, impacts associated with hazardous waste from HTF spills cannot be accurately analyzed and response plans cannot be designed to address spills. The DEIS must be revised accordingly.

The DEIS also fails to provide sufficient field response plans for HTF spills. Specifically, the DEIS does not provide for the management of free-standing liquids following a spill, nor does it require sampling HTF-contaminated soil at the point of the spill origin. Movement of contaminated soil to the land treatment unit without testing may result in placing hazardous waste in the land treatment unit, which is prohibited by State law. To protect human health and the environment, the DEIS must be revised to include a corrective action plan for the cleanup of HTF-

contaminated soils which includes sampling procedures, cleanup goals and methods for long-term monitoring.

In addition, the DEIS fails to analyze potentially significant impacts from benzene, a HTF degradation product and known human carcinogen. The presence of benzene in vapor and soils poses a serious health risk to workers. The DEIS recognizes that benzene is a degradation product of HTF, yet lacks any analysis of impacts associated with benzene from HTF spills. The DEIS also completely fails to provide for monitoring of benzene in the soil at the land treatment unit and in groundwater. As Hagemann states in his comments, monitoring of soil is particularly critical considering benzene's rapid movement through soil. Monitoring of groundwater is critical because benzene typically does not adsorb to soil, and the groundwater table at the Project site is fairly shallow. Thus, there is a potential for benzene contamination to impact beneficial uses of groundwater in the Chuckwalla Valley Groundwater Basin including domestic, municipal, agricultural, and industrial use. The DEIS must be revised to provide for benzene soil and groundwater monitoring, and must include an analysis of and mitigation for potentially significant impacts to workers from exposure to benzene.

2. The DEIS Fails to Adequately Analyze, Disclose and Mitigate Hazards Associated with Former Military Use of the Site

The DEIS identifies unexploded ordinance ("UXO") in the Project area, and generally describes the history of General Patton's World War II Desert Training Center. Moreover, the Phase I Environmental Site Assessment ("ESA") for the Project recommended a UXO survey due to the Project site's former use for military maneuvers.[96] Despite the Phase I ESA, the DEIS does not provide for a UXO survey.

Mr. Hagemann, an expert in hazardous materials, reviewed the DEIS with respect to hazards associated on the site from remnants of the military's use of the site in the 1940s. Hagemann also conducted his own research regarding the military's use of the Project site. Mr. Hagemann discovered that the general vicinity of the Project area was in an area identified as a "gunnery range" on a map of the Desert Training Center. The gunnery range map is attached to Hagemann's comments. Mr. Hagemann also found that several military exercises were conducted in Chuckwalla Valley, an area that the military believed to best

[96] Phase I Environmental Site Assessment, Genesis Solar Energy Project, Ford Dry Lake, August 2009, p. 6.1.

represent the terrain of Libya. Given the intensity of the military maneuvers in Project vicinity, Hagemann concludes that a UXO survey must be conducted to ensure worker safety. Once the survey is completed, the DEIS must be revised to include the results of the survey and an analysis based on those results and the revised DEIS must be circulated for public review and comment.

D. The DEIS Must Disclose, Analyze and Mitigate All Potentially Significant Impacts to Water Resources

1. The DEIS Fails to Adequately Analyze Potentially Significant Impacts to CVGB Balance

The DEIS concludes that the Project would not significantly impact basin balance in the Chuckwalla Valley Groundwater Basin ("CVGB") because Project pumping plus other basin outflows would not exceed inflows to the basin. However, according to expert hydrogeologist Eric Hendrix, the DEIS fails to account for (1) long-term drought and climate change; (2) uncertainties regarding outflow from CVGB to the Palo Verde Mesa Groundwater Basin ("PVMGB"); and (3) uncertainties associated with the Applicant's groundwater investigations and flow model.

First, the DEIS overestimates the CVGB's net available water supply. The DEIS states that groundwater in storage will be 15,000,000 acre-feet over the construction and operation period of the Project. However, according to Hendrix, groundwater in storage is not a meaningful baseline for effective groundwater management because it fails to account for long-term drought and climate change. The more appropriate standard for basin management is the amount of groundwater outflow that can be sustained over time without creating significant detrimental impacts. This approach necessarily accounts for the effects of potential reduction in expected basin recharge during long-term droughts and climate change, and the ability of the basin to naturally recharge over time as groundwater exceeding average budget recharge is extracted over many years. The DEIS must be revised to consider the effect of long-term drought and climate change on groundwater sustainability.

Second, the DEIS underestimates the outflow from CVGB to PVMGB. The DEIS assumes that the outflow is 400 acre-feet per year ("AFY"). However, the

Applicant provided an estimated outflow of 988 AFY.[97] Thus, the available CVGB water budget must be reduced from 2,608 AFY to 2,020 AFY. Consequently, with Project operation, there is a small margin of error of 348 AFY for water supply management. Given this small margin of error, the poor water well control and water level data for the CVGB, the existing drought in the greater Colorado River watershed, and the numerous projects proposed to pump groundwater from the CVGB, the DEIS' conclusion that the Project will not result in significant impacts to CVGB water balance is unsupported.

Third, the DEIS' conclusion that the Project will not significantly impact CVGB balance fails to account for the substantial uncertainties associated with the Applicant's groundwater studies and informational data gaps. For example, the Applicant indicated that there are only two wells near the Project site with water level data collected during the time period of greatest interest to evaluating groundwater response to Project pumping. This is a very limited data set and provides little useful information in evaluating long-term groundwater response to pumping in the CVGB.

In sum, the DEIS' conclusion that the Project will not significantly impact CVGB water balance is unsupported. BLM must take a hard look at impacts to groundwater basin balance and revise the DEIS accordingly.

2. <u>The DEIS' Proposed Groundwater Monitoring Plan and Water Supply Plan are Inadequate</u>

Due the uncertainties described in the preceding section, the DEIS proposes a groundwater monitoring plan and water supply plan to determine groundwater response to Project pumping. However, the proposals are inadequate for several reasons. First, the DEIS recommends use of only existing groundwater wells within the CVGB for the monitoring program. However, there are no existing monitoring wells within three miles of the Project, few existing wells screen depths below 800 feet where Project pumping will occur, and existing wells screen across multiple aquifers and confining units, not across discrete zones where Project pumping will occur. As a result, the recommended monitoring program will be wholly ineffective in determining groundwater response to Project pumping.

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[97] Genesis Solar, LLC's Data Responses to CURE's Data Requests Set 2 (1-9), Item 6.

3. The DEIS Fails to Mitigate Significant Impacts to the Colorado River

The DEIS concludes that the Project's proposed groundwater pumping may be illegal and will significantly impact the adjudicated Colorado River. The DEIS states, "the Project has the potential to divert Colorado River water without any entitlement to the water, and all groundwater production at the site could be considered Colorado River water."[98]

The Project clearly requires an entitlement prior to any groundwater pumping. However, the DEIS does not identify whether the Project has obtained such an entitlement. Therefore, there is no information regarding whether the Project's proposal to pump groundwater is a reliable water source.

With respect to significant impacts, the DEIS proposes that the Applicant replace 51,920 acre feet of water that will be pumped from the Colorado River over the life of the Project. However, the DEIS does not identify a replacement water source. The DEIS' proposal for replacement of 51,920 acre feet of water from the Colorado River without identifying a replacement water source fails to satisfy the requirements of NEPA. NEPA requires that the DEIS include an analysis of potential environmental impacts associated with replacing 51,920 acre-feet of water. Where mitigation measures would, themselves, cause significant environmental impacts, NEPA requires an evaluation of those secondary (indirect) impacts.[99] Furthermore, before undertaking a project, the lead agency must assess the environmental impacts of all reasonably foreseeable phases and components of a project.[100]

The DEIS must identify the Applicant's entitlement to Colorado River water for the Project in order to confirm whether groundwater pumping is a reliable source of water for the Project. The DEIS must also fully describe and evaluate all potentially significant impacts associated with the Project's replacement of 51,920 acre-feet of water taken from the Colorado River. Any Revised DEIS that contains this missing information must be circulated for public review and comment.

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[98] DEIS, p. C.9-47.

[99] 40 C.F.R. § 1502.16(h).

[100] 40 C.F.R. § 1502.16(b); *see also Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992).

E. The DEIS Must Disclose, Analyze and Mitigate All Potentially Significant Impacts Associated with New Roads

The DEIS concludes that, in order to ensure access to the Project site for emergency vehicles, the Applicant must provide a second access route to the site.[101] However, the DEIS does not contain an assessment of potentially significant impacts associated with the construction or operation of an additional access road.

Where mitigation measures would, themselves, cause significant environmental impacts, NEPA requires an evaluation of those secondary (indirect) impacts.[102] Here, the Applicant proposed the location of the second access road after publication of the DEIS. Thus, the DEIS must be revised to include an analysis of any associated potentially significant impacts and recirculated for public review and comment.

F. The DEIS Must Disclose and Analyze All Potentially Significant Impacts Associated with Transmission System Engineering

The DEIS states that "[t]he Phase I Interconnection Study (Phase I Study) does not provide a meaningful forecast of the transmission reliability impacts of the [Project]."[103] According to the DEIS, the Phase II Study Interconnection Study will not be completed until September, 2010,[104] and therefore an analysis of potentially significant impacts associated with any downstream transmission facilities identified in the study will be conducted by the California Public Utilities Commission.[105] NEPA requires that the DEIS include environmental review of connected actions which have the potential to result in a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.[106] Connected actions may include facilities not licensed by the BLM. The DEIS fails to analyze the Project's potentially significant impacts associated with any downstream transmission facilities. Therefore, after the Phase II Study

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[101] DEIS, p. C.14-29.

[102] 40 C.F.R. § 1502.16(h).

[103] DEIS, p. D.5-1.

[104] *Id.*; At the April 26, 2010 status conference, the Applicant stated that the Phase II Study would be completed on June 30, 2010.

[105] DEIS, p. D.5-7.

[106] 40 C.F.R. §1508.25(a).

is completed, the DEIS must be revised to include this analysis, and be circulated for public review and comment.

G. The DEIS Must Analyze the Project's Contribution to Several Acknowledged Categories of Significant Cumulative Impacts

A proper consideration of a Project's cumulative impacts requires "'some quantified or detailed information; ... [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided.'"[107] The analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects."[108]

The DEIS fails to consider the Project's contribution to adverse cumulative impacts to wildlife connectivity and other cumulative impacts that will be caused by the influx of immense solar facilities in the CDCA Plan area. The Project's contribution must be considered together with nearby proposed large-scale solar projects, including but not limited to:

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[107] *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 361 F.3d 1108, 1128 (9th Cir. 2004), quoting *Neighbors of Cuddy Mountain*, 137 F.3d at 1379-80.

[108] *Id.*, internal quotations and citations omitted.

Table 1: Proposed Large Scale Solar Projects in the Vicinity of the Project

Project Name/ Serial No.	Applicant	Type	BLM Acreage[109]	CEC Acreage[110]	DEIS Acreage[111]
Chuckwalla Solar 1, CACA 48808	**Chuckwalla Solar, LLC**	**Photo-voltaic ("PV")**	**4,099**	**Not Available**	**ROW: 4,091**
Blythe, CACA 48811	Solar Millennium	Solar Thermal ("ST")	11,056	ROW: 9,400 Disturbed: 7,030	ROW: 7,239
Palen, CACA 48810	Solar Millennium	ST	3,117	ROW: 5,200 Disturbed: 3,995	ROW: 2,974
Genesis McCoy, CACA 48728	FPL	ST	20,608	Not Available	ROW: 20,560
CACA 49097	**Bullfrog Green Energy, LLC**	**ST**	**6,634**	**Not Available**	**ROW: 22,663**
Desert Sunlight, CACA 48649	First Solar, Inc.	PV	14,905	Not Available	ROW: 5,119
Desert Quartzite, CACA 49397	**First Solar, Inc.**	**PV**	**7,548**	**Not Available**	**ROW: 7,530**
CACA	EnXco Development,	ST	1,327	Not Available	ROW: 1,325

[109] *See* First-In-Line Solar Applications, dated December 21, 2009, available at http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/solar.Par.45875.File.dat/Renew_Energy_2_09_solar.pdf (as of June 11, 2010).

[110] *See* links to CEC descriptions of pending solar projects, available at: http://www.energy.ca.gov/sitingcases/all_projects.html#review (as of June 11, 2010). Some acreage figures were taken from the environmental review documents prepared for the respective project, when available.

[111] *See* DEIS, Biological Resources Table 9, p. C.2-115.

Project Name/ Serial No.	Applicant	Type	BLM Acreage[109]	CEC Acreage[110]	DEIS Acreage[111]
49488	Inc. ("EnXco")				
CACA 49489	EnXco	ST	16,088	Not Available	Not Available*
CACA 49490	EnXco	ST	20,608	Not Available	Not Available*
CACA 49491	EnXco	ST	1,327	Not Available	Not Available*
Big Maria Vista, CACA 49702	Bullfrog Green Energy, LLC	ST	22,717	Not Available	ROW: 22,663
CACA 50379	Lightsource Renewables, LLC	ST	2,446	Not Available	Not Available*
		Totals	147,446	?	?

* The DEIS apparently did not consider these projects in the cumulative impacts analyses.

Together, these nearby pending projects would occupy almost **150,000 acres** (the amount of disturbed acres has been inconsistently reported by the CEC and BLM), primarily within desert valleys where groundwater and vegetation generally are more plentiful than in upland areas.[112]

H. The DEIS Fails to Adequately Address the Irreversible Commitment of Resources Associated with the Project

The impacts analysis must include a discussion of the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.[113] Here, the Project lifespan is projected to be 30 years. While the DEIS purports to analyze Project decommissioning, it does not adequately address the long-term

[112] *See* Attachment F, BLM Map: Renewable Energy Projects and Utility Corridors, Projects as of May 21, 2010.

[113] 40 C.F.R. § 1502.16.

ramifications of disturbing the landscape to build and operate this Project.[114] This type of problem solving must occur now, before the BLM approves a proposed Project that will disturb thousands of acres of habitat and the wildlife that currently occupy this habitat.

VII. CONCLUSION

The DEIS fails as an informational document and, thus, is inadequate under NEPA. The DEIS fails to establish the Project setting, does not fully and fairly describe the proposed action, provides incomplete analyses of some Project impacts and wholly omits discussion of other potentially significant environmental impacts, and fails to adequately mitigate the Project's adverse impacts. The DEIS must be revised to cure these legal procedural and substantive deficiencies and must be circulated for public review and comment. We respectfully urge the BLM to do so prior to taking any action on the Applicant's pending federal permit applications.

Sincerely,

Rachael E. Koss

REK:bh
Attachments

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[114] *See, e.g.*, DEIS, p. C.2-101 [acknowledging Applicant's draft decommissioning plan inadequate for evaluating success of site restoration].

ATTACHMENT A
CASHEN COMMENTS

Scott Cashen, M.S.—Independent Biological Resources Consultant

July 8, 2010

Allison Shaffer, Project Manager
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, CA 92262
Email: CAPSSolarNextEraFPL@blm.gov

Re: Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

I have been working for the California Unions for Reliable Energy ("CURE") as a consultant on the Application for Certification ("AFC") for the Genesis Solar Energy Project ("Project") since the data adequacy phase. I have reviewed numerous documents and have conducted my own investigations and analyses regarding the Project's potential environmental impacts and alternatives.

I have a Master's of Science Degree in Wildlife and Fisheries Science from the Pennsylvania State University, University Park. The degree program included coursework in Landscape Ecology, Biometrics, Statistics, Conservation Biology, and Wetland Ecology. For my thesis, I conducted seven seasons of independent research on avian use of restored wetlands. The U.S. Fish and Wildlife Service subsequently used my technical report as a model for other habitat restoration monitoring projects in Pennsylvania.

My employment experience has included work in the fields of wildlife biology, forestry, and natural resource consulting. Much of my work over the past two and a half years has involved review of environmental documents associated with development of large-scale solar energy facilities. To date, I have served as an expert on 12 different solar projects, 9 of which are being sited in the Mojave or Sonoran Desert. I am currently concluding a two-year contract I hold with the State of California to conduct surveys for the Peninsular bighorn sheep near Anza-Borrego Desert State Park. I serve as a member of the scientific review team responsible for assessing the effectiveness of the U.S. Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.

For the past two and a half years I have operated my own consulting business. I previously served as a Senior Biologist for TSS Consultants and ECORP Consulting. Other positions I have held have included conducting wildlife research for the National Park Service, the Point Reyes Bird Observatory, and the University of California. While in graduate school I served as an instructor of Wildlife Management and as a teaching assistant for a course on ornithology.

My testimony is based on the activities described above and the knowledge and experience I have acquired during more than 18 years of working in the field of natural resources management. A summary of my education and experience is attached to this testimony as Attachment 1.

I. THE PROJECT MAY RESULT IN UNMITIGATED SIGNIFICANT IMPACTS TO GILA WOODPECKERS

The Gila woodpecker (*Melanerpes uropygialis*) is listed as endangered under the California Endangered Species Act. The Revised Staff Assessment ("RSA") lists it as a species that is "known to occur or could potentially occur in the Project area and vicinity."[1] The RSA subsequently lists it as a species with "no or low-to-moderate potential to occur in the Project area."[2] The RSA ultimately concludes the Gila woodpecker is not expected to occur at the Project site.[3] To support this conclusion, the RSA stipulates: (a) the Gila woodpecker is currently known only from the Colorado River; (b) the Project site does not contain suitable nesting habitat for the species; and (c) the closest California Natural Diversity Database (CNDDB) record for the species is a 1986 occurrence east of the Project site at the Colorado River.[4] I have reviewed the literature associated with each of these pieces of evidence, and I have concluded the evidence presented in the RSA is neither entirely accurate, nor sufficient to conclude that the Gila woodpecker does not occur on the Project site. In the subsequent sections, I discuss the evidence provided in the RSA, as well as recent information supporting an inference that Gila woodpeckers may occur at the Project site.

A. The RSA Does Not Accurately Report the Range of the Gila Woodpecker

The RSA states Gila woodpeckers formerly occurred in desert washes up to one mile from the Colorado River, and that they are currently limited to areas along the Colorado River.[5] Staff has not cited the source of this information. However, based on the verbiage, Staff's information appears to have been derived from either

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[1] RSA, p. C.2-22.
[2] Id.
[3] RSA, p. C.2-56.
[4] RSA, p. C.2-56.
[5] Id.

the 1987 petition to list the species,[6] or the 2002 NECO Plan.[7] While technically correct at the time the documents were published, the information presented in these sources is now outdated. Since the documents were published researchers have discovered populations of Gila woodpeckers at several locations west of the Colorado River. These locations are documented in the California Natural Diversity Database (CNDDB) (illustrated in Attachment 2),[8] and in the Desert Bird Conservation Plan published by California Partners in Flight and Point Reyes Bird Observatory (illustrated in Attachment 3).[9]

B. The RSA Does Not Accurately Report Nesting Habitat for Gila Woodpeckers

The RSA concludes that the Project area does not contain suitable habitat for the Gila woodpecker.[10] However, the RSA does not provide a citation or any information to justify this conclusion. Several studies and surveys have documented Gila woodpeckers breeding in dry desert wash woodlands such as those that occur in the Project area. Grinnell and Miller (1944) reported Gila woodpecker habitat as:

> [m]ainly riparian cottonwoods and willows, of old growth; but also up *desert washes where ironwood and palo verde reach large size.* Availability of diggable tree-trunks for nesting seems to be primary factor for presence; a favoring one is *presence of berry-bearing mistletoe as parasitic especially on mesquite.*[11]

The conditions reported by Grinnell and Miller (1944) may be present in the Project area. The RSA states:

> The Applicant has identified a stand of desert dry wash woodland as occurring east of the Project area, within the large Palen Wash, but had described this habitat type as absent from the Project area (GSEP 2009a). In their revised delineation the Applicant describes areas of

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[6] Larsen CJ. 1987. Petition to the State of California Fish and Game Commission. http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=3356

[7] BLM and CDFG. 2002. Final Environmental Impact Statement. Proposed Northern & Eastern Colorado Desert Coordinated Management Plan. Bureau of Land Management, California Desert, Riverside, CA. p. 2-2.

[8] California Natural Diversity Database. 2009. Rarefind [computer program]. Version 3.1.0. Mar 2, 2010. Sacramento (CA): Wildlife & Habitat Data Analysis Branch. California Department of Fish and Game.

[9] CalPIF (California Partners in Flight). 2009. Version 1.0. The Desert Bird Conservation Plan: a Strategy for Protecting and Managing Desert Habitats and Associated Birds in California. California Partners in Flight. http://www.prbo.org/calpif/plans.html.

[10] RSA, p. C.2-56.

[11] Grinnell J, AH Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna No. 27. 608pp. [emphasis added].

areas of microphyllous riparian vegetation occurring in washes along the linear Disturbance Area. The microphyllous vegetation identified in these washes consists of three tree species (palo verde, ironwood, and honey mesquite) and totals 16 acres (TTEC 2010). Within the proposed Project area ironwood and palo verde occur in low densities but one wash along the linear facility route, identified as Wash 24-26 in the jurisdictional delineations report (TTEC 2010l) supports a relatively dense concentration of 270 palo verde trees. Wash 31 consists of honey mesquite and is also relatively dense.[12]

According to the Applicant's estimate, 888 palo verde, ironwood, and honey mesquite trees greater than 4" in diameter occur along desert washes in the Project area.[13] These tree species also occur at lower densities in other portions of the Project area.[14] Anderson et al. (1982) observed Gila woodpecker nests in honey mesquite trees along the lower Colorado River.[15] McCreedy et al. (2006) surveyed Milpitas Wash in Imperial County and reported every Gila woodpecker nest they detected occurred in blue palo verdes.[16] The Desert Bird Conservation Plan, a joint effort between California Partners in Flight and Point Reyes Bird Observatory, states that the presence of blue palo verde has been found to positively influence presence and abundance of the Gila woodpecker.[17] According to the California Natural Diversity Database, 9 of the 34 (26%) documented occurrences of Gila woodpeckers within the State of California are associated with vegetation communities similar to those present on the Project site (Reproduced below in Table 1).[18]

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[12] RSA, C.2-17.
[13] Tetra Tech. 2010 Mar 15. Revisions to the Jurisdictional Waters at the Genesis Solar Energy Project. Appendix C.
[14] AFC, Bio Tech Report, Table 3.
[15] Anderson et al. 1982. Evidence for social regulation in some riparian bird populations. American Naturalist. 120:340-352.
[16] McCreedy, C., C. Howell, and L. Culp. 2006. Xeric Riparian Songbird Project: 2004 progress report. PRBO Conservation Science, 4990 Shoreline Highway, Stinson Beach, CA, 94970. PRBO Contribution No. 1309.
[17] The Desert Bird Conservation Plan: A Strategy for Protecting and Managing Desert Habitats and Associated Birds in the Mojave and Colorado Deserts. 2009. Version 1.0. California Partners in Flight and Point Reyes Bird Observatory Conservation Science. Table 8-2. p.70.
[18] California Natural Diversity Database. 2009. Rarefind [computer program]. Version 3.1.0. Mar 2, 2010. Sacramento (CA): Wildlife & Habitat Data Analysis Branch. California Department of Fish and Game.

Table 1. CNDDB records of Gila woodpecker occurrences in habitat comparable to habitat on the Project site.

Record No	Ecological community
24	HABITAT CONSISTS OF SALT CEDAR, MESQUITE, AND PALO VERDE WITH A QUAIL BRUSH UNDERSTORY; GOOD HABITAT EXCEPT FOR THE PRESENCE OF SALT CEDAR.
25	HABITAT CONSISTS OF PALO VERDE, MESQUITE, AND SALT CEDAR; OPEN AREAS ARE CREOSOTE GROUND COVER.
28	HABITAT IS PALO VERDE, SALT CEDAR, AND MESQUITE; MANY TRAILER PARKS AND SOME ORV USE IN THE AREA, OTHERWISE GOOD HABITAT.
30	DESERT WASH WOODLAND WITH PALO VERDE & IRONWOOD SURROUNDED BY DISTURBED CREOSOTE BUSH SCRUB.
31	DESERT WASH SCRUB WITH PALO VERDE AND IRONWOOD
32	DESERT WASH SCRUB WITH PALO VERDE AND IRONWOOD SURROUNDED BY CREOSOTE BUSH SCRUB.
33	DESERT WASH WOODLAND WITH PALO VERDE, IRONWOOD, CREOSOTE BUSH AND MESQUITE.
34	BRAIDED WASH WITH OLNEYA TESOSA, CERCIDIUM MICROPHYLLA, & LARREA TRIDENTATA
35	MICROPHYLL WOODLAND DOMINATED BY PALO VERDE, CREOSOTE AND IRONWOOD. AREA USED FOR OHV RECREATION AND CAMPING.

C. The Revised Staff Assessment has Misused the CNDDB

Staff suggests that there is a low potential for occurrence of the Gila woodpecker due to the Project's distance from the nearest CNDDB record (which is along the Colorado River).[19] Staff's reasoning is not justifiable for the following reasons. First, the CNDDB is a positive sighting database. As a result, a lack of records in the CNDDB cannot be used to conclude an animal does not occur in a given area. Second, isolated populations of Gila woodpeckers have been reported at distant, disconnected locations, such as Griffith Park in Los Angeles (among other locations).[20] This information indicates that Gila woodpeckers will disperse to, and colonize, suitable habitat disjunct from the Colorado River. Third, the Gila woodpecker has been documented at several locations south of the I-10, which are approximately as far west from the Colorado River as the Project site.[21] Fourth, Staff's conclusion that the Gila woodpecker is absent from the Project area appears to be largely due to an absence of prior survey efforts rather than a lack of habitat. According to the 2009 Desert Bird Conservation Plan, Milpitas Wash (Imperial County) is the only xeric riparian habitat that has been specifically surveyed for Gila woodpeckers. Information associated with the CNDDB occurrence records south of I-10 (e.g., several unique detections made on the same date), and the proximity of Gila woodpecker occurrences to Highway 78, suggest the records were obtained as part of a survey route or other focused effort. Although the Project site is slightly further north of the core of the species' range, there is nothing to suggest that the same pattern of distribution does not occur north of I-10 as occurs south of I-10.

The Project would result in direct impacts to at least 298 desert wash tree species and 16 acres of dry desert wash woodland.[22] Based on the information described above, and the lack of information provided in the Applicant's survey reports, it is my professional opinion that the Gila woodpecker has the potential to occur on the Project site. Without appropriate mitigation, the Project may cause a significant impact on the species and its habitat.

II. THE REVISED STAFF ASSESSMENT DOES NOT PROVIDE ADEQUATE BASELINE INFORMATION OR MITIGATION MEASURES FOR THE COUCH'S SPADEFOOT TOAD

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[19] Revised Staff Assessment, p. C.2-56.

[20] Edwards, Holly H. and Gary D. Schnell. 2000. Gila Woodpecker (Melanerpes uropygialis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/532 doi:10.2173/bna.532

[21] See Figure 1.

[22] Tetra Tech. 2010 Mar 15. Revisions to the Jurisdictional Waters at the Genesis Solar Energy Project. Appendix C; RSA, C.2-17.

The Genesis Project is located at the western border of the Couch's spadefoot toad range.[23] With respect to the species occurring on the Project site the RSA concluded: (a) "because the [Applicant's] surveys were not conducted during the proper season (i.e., after summer rains), the lack of observations does not suggest the species is absent from the Project site"[24]; and (b) "[w]ithout species-specific survey results and with limited occurrence information, it is difficult to assess the potential for direct and indirect impacts to Couch's spadefoot toads."[25] Without species-specific survey results (including presence of toads and presence of habitat elements), Staff cannot provide an adequate assessment of Project impacts on Couch's spadefoot toads. Without an adequate impact assessment, Staff is unable to devise an appropriate mitigation strategy.

Couch's spadefoot toads have three principal habitat requirements.[26] These are:

1. Temporary desert rainpools with water temperatures >15 °C in which to breed. The breeding pool must last for at least seven days for metamorphosis to occur.
2. Subterranean refuge sites (with a loose enough substrate to permit burial) must occur in the vicinity of the breeding pool; and
3. An insect food base (that probably includes alate termites) and primary production that sustains the food base.

There is evidence that suggests the presence of breeding ponds is the limiting factor in the distribution of Couch's spadefoot toads.[27] Therefore, in the absence of site-specific survey results (on toads), the presence of suitable breeding ponds can be used as an index of toad presence. During the 2009 surveys, the Applicant contends it searched for artificial or temporary water catchments that could serve as breeding pools for Couch's spadefoot toads.[28] No water catchments were identified during the surveys.

Staff has concluded that impacts to breeding ponds within the westernmost range of the Couch's spadefoot toad would be a significant impact.[29] However, despite the obvious data gaps reported in the RSA, Staff "agrees with the Applicant that it is unlikely the solar facility site supports breeding pond habitat thought [*sic*] it may provide habitat for subterranean burrows if there is a breeding pond within

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[23] RSA, p. C.2-86.
[24] RSA, p. C.2-39.
[25] RSA, p. C.2-86.
[26] Jennings MR, MP Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Dept. of Fish and Game, Inland Fisheries Division.
[27] RSA, p. C.2-86.
[28] RSA, p. C.2-39.
[29] RSA, p. C.2-86.

dispersal distance."[30] This is not a reliable conclusion for the several reasons.

First, the Applicant has provided information that suggests its search for breeding pond habitat was limited to a few select locations, most of which lie outside of the Project area.[31]

Second, Couch's spadefoot toads breed in temporary pools that form after summer rains.[32] The Applicant's search for pools did not occur after summer (or other) rains.[33]

Third, the Applicant reported "[n]o artificial or temporary water catchments that could serve as breeding pools for Couch's spadefoot toad" occur in the Project area.[34] Staff has determined the Applicant's statement is incorrect. Specifically, Staff reviewed Project site aerials and "identified some *areas* that appear to sustain or that could potentially sustain surface water", including a *large* ponded area along the Project transmission line route.[35]

Fourth, the Project transmission line corridor overlaps a known breeding site for Couch's spadefoot toads.[36]

Fifth, Staff's analyses were limited primarily to aerial photo interpretation. The RSA does not provide the methods that were used in Staff's analyses, including the date(s) of the imagery; its scale and resolution; the methods used to identify areas that potentially sustain water; and the extent of ground-truthing (i.e., field verification). Couch's spadefoot toads may breed in small pools that cannot be identified through use of aerial imagery. Furthermore, given Couch's spadefoot toads are able to exploit ponds that contain water for as few as nine days, the imagery used by Staff would need to have been generated within nine days of rainfall for it to provide a reliable depiction of breeding habitat.

Sixth, the Carsitas soil series occurs in the Project area.[37] According to the Applicant, torrential summer thundershowers occasionally produce enough runoff to flood Carsitas soils for brief periods.[38] This suggests at least some of the soils in the Project area provide a suitable substrate for the formation of breeding ponds.

Finally, the RSA does not provide any information to justify its conclusion

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[30] RSA, p. C.2-86.
[31] *See* AFC, Bio Tech Report, p. 29; *See* Map associated with Applicant's response to CURE Data Request #32; *See also* Applicant's response to CURE Data Request #45 and Figure 6 in Genesis Solar, LLC. 2009 Dec 31. Application for Incidental Take of Threatened and Endangered Species.
[32] Jennings MR, MP Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Dept. of Fish and Game, Inland Fisheries Division.
[33] *See* Tetra Tech. 2010 Jun 11. Fall 2009 and Spring 2010 Biological Resources Technical Report for the Genesis Solar Energy Project. Table 2.
[34] Applicant's response to CURE Data Request #44; AFC, Bio Tech Report, p. 49.
[35] RSA, p. C.2-39. [emphasis added].
[36] RSA, p. C.2-86.
[37] Tetra Tech. 2009 Aug. Survey for Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Eastern Riverside County, California. Appendix B.
[38] Id.

that the Project site is unlikely to support Couch's spadefoot toad breeding habitat, other than it is the Applicant's contention. The Applicant's contention has proven to be unreliable and is contradicted by the information presented above.

Since the issuance of the RSA, the Applicant has submitted the results of its Spring 2010 surveys. The results of the surveys confirm suitable breeding habitat for Couch's spadefoot toads occurs along the Project transmission line routes.[39] However, the critical limitations identified in the RSA have not been resolved. Specifically, appropriately timed surveys have not been conducted, and the Applicant has yet to provide reliable information on toad breeding habitat within the main Project site boundaries. Without reliable data an accurate impact assessment cannot be developed, and without an accurate impact assessment, one cannot conclude that Staff's proposed mitigation to avoid impacts to breeding ponds would reduce Project impacts to less than significant levels. This is reflected in the RSA's discussion of impacts associated with the Colorado River Substation:

> Staff has concluded that SCE's proposed expansion of the Colorado River Substation has the potential to result in significant direct, indirect and cumulative impacts to biological resources, in particular for sensitive dune-dependent plant species such as Harwood's eriastrum. Avoidance, minimization and compensation measures such as those described in staff's proposed Conditions of Certification BIO-19 ***could*** potentially reduce these impacts to less than significant levels. However, implementation of the avoidance measures described in these conditions of certification would ***require site specific information*** about the location of proposed project features in relation to sensitive plant species. Staff does not currently have that project-specific information and therefore ***cannot address the feasibility of implementing effective avoidance measures*** as a means of reducing significant impacts.[40]

The Applicant has indicated surveys (related to Couch's spadefoot toad) have been scheduled for summer or early fall 2010.[41] As a result, Staff does not have the necessary "site specific information" to adequately mitigate significant impacts to Couch's spadefoot toad habitat. Furthermore, I reserve the right to submit supplemental testimony on this topic after the Applicant has provided the information necessary to evaluate existing conditions, Project impacts, and mitigation measures for the Couch's spadefoot toad.

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[39] Tetra Tech. 2010 Jun 11. Fall 2009 and Spring 2010 Biological Resources Technical Report for the Genesis Solar Energy Project. ES-1.
[40] RSA, p. C.2-126. [emphasis added].
[41] Tetra Tech. 2010 Jun 11. Fall 2009 and Spring 2010 Biological Resources Technical Report for the Genesis Solar Energy Project. p. 17.

A. The RSA Does Not Ensure Mitigation of Project Impacts to the Couch's Spadefoot Toad

While mitigation for impacts to Couch's spadefoot toad is necessary, the measures proposed by Staff must be revised to ensure they achieve their intended purpose. Condition of Certification BIO-27 (BIO-27) requires the Applicant to prepare and implement a Couch's Spadefoot Toad Protection and Mitigation Plan (Protection and Mitigation Plan) to avoid, minimize or mitigate impacts to Couch's spadefoot toads and their breeding habitat during construction and operation of the Project.[42] As part of the Protection and Mitigation Plan, the Applicant is supposed to provide habitat surveys (including methods and results); an impact assessment; and avoidance, minimization and mitigation measures.[43] BIO-27 requires the Applicant to submit the final Protection and Mitigation Plan no less than 30 days prior to construction-related ground-disturbance.[44]

The RSA establishes that Project mitigation plans "***cannot defer establishing reasonable performance standards and goals.***"[45] These plans "***must explicitly state***" the goals and they must provide guidelines for developing milestones and specific, quantitative success criteria.[46] Furthermore, they must establish thresholds that would trigger remedial actions, and provide information on what those remedial actions would be.[47] The plans should also provide an approximate outline and schedule for monitoring the success of the effort.[48] BIO-27 lacks many of these elements, which the RSA has established cannot be deferred to the future.

If complete avoidance of the pond south of I-10 or other breeding sites identified during yet to be conducted surveys is not possible, BIO-27 requires the Applicant to create "additional breeding habitats (ephemeral pond) at least equal in area to the acreage of ponds being impacted".[49] BIO-27 does not ensure mitigation of Project impacts to Couch's spadefoot toad for the following reasons.

1. <u>BIO-27 Does Not Meet the Habitat Requirements of the Couch's Spadefoot Toad</u>

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[42] RSA, p. C.2-276.
[43] RSA, p. C.2-276, 277.
[44] RSA, p. C.2-277.
[45] RSA, p. C.2-123 (emphasis added).
[46] Id.
[47] Id. at p. C.2-124.
[48] Id.
[49] RSA. p. C.2-277.

Couch's spadefoot toads have three principal habitat requirements.[50] The mitigation proposed in BIO-27 addresses only *one* of these habitat requirements, and provides *no assurance* that this single habitat requirement will be met. Specifically, the only habitat requirement addressed by Staff's proposed mitigation is the need for the Applicant to create ponds capable of holding water for at least nine days during the spadefoot toad breeding season. Furthermore, the "breeding season" has been only loosely defined, and criteria for establishing it need to be provided in Staff's mitigation. Because BIO-27 does not require the created ponds to have water temperatures >15 °C, there is no assurance they will serve as suitable breeding sites.

Further, Staff's proposed mitigation has no provision for subterranean refuge sites or a sustainable food base—the other two habitat requirements for Couch's spadefoot toads.[51] These criteria must be incorporated into BIO-27 for the mitigation measure to have a reasonable possibility of success. Moreover, the proposed mitigation lacks any discussion of where created ponds would be located how they would be conserved in perpetuity, a funding mechanism for their creation, preservation, and management; and the water supply for meeting Staff's condition that they hold water for a minimum of nine days.

2. <u>Performance Criteria Central to Reserve Design Are Not Incorporated into the Mitigation Scheme</u>

The RSA suggests water quality, vehicle noise, and other anthropogenic disturbances may negatively affect Couch's spadefoot toads.[52] BIO-27 does not require the Applicant's mitigation to meet any minimum standards associated with these potentially influential variables. In addition, BIO-27 does not establish performance criteria for any of the issues (or considerations) central to reserve design. These include site selection, corridors, buffers, isolation, and fragmentation.[53] As noted by Staff, the Genesis Project is located at the western edge of the Couch's spadefoot toad range.[54] Thus, any ponds that are created west of existing breeding ponds (i.e., outside the species' range) may be of no value to the existing population of spadefoots.[55]

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[50] Jennings MR, MP Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Dept. of Fish and Game, Inland Fisheries Division.
[51] Jennings MR, MP Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Dept. of Fish and Game, Inland Fisheries Division.
[52] RSA, p. C.2-39.
[53] Morrison ML. 2002. Wildlife restoration: techniques for habitat analysis and animal monitoring. Washington (DC): Island Press.
[54] RSA, p. C.2-86.
[55] Due to limitations in survey data, the precise border of the species' range is unknown. However, the example provided illustrates the need to consider variables central to reserve design when designing mitigation for the Couch's spadefoot toad.

3. Mitigation Does Not Impose Limits on Patch Size

Scientists that developed the California Wildlife Habitat Relationship model considered patch size to be an important consideration in habitat suitability for Couch's spadefoot toads.[56] In particular, once a certain patch size is reached, area alone does not increase habitat suitability. This is especially important because Staff's proposed mitigation does not require the Applicant to replicate the distribution and number of pools impacted by the Project; the condition only requires that mitigation be implemented for those acres that are impacted (e.g., the Applicant could create one "mega" pool to replace impacts to 10 well-distributed pools). Because distribution and abundance of pools may affect overall habitat suitability for Couch's spadefoot toads, minimum standards associated with them need to be incorporated into Staff's mitigation.

4. Potentially Significant Adverse Impacts of BIO-27

The RSA suggests the proposed mitigation may require ground disturbance (for example, soil compaction).[57] However, it does not appear to require an environmental impact analysis for the associated ground disturbance activities, habitat conversion, or water use (if an artificial water source is used). At a minimum, these elements of BIO-27 must be evaluated to ascertain whether there are any potentially adverse impacts stemming from Staff's proposed mitigation.

5. Monitoring Requirements

A management approach (e.g., creation of spadefoot toad breeding ponds) that is unsubstantiated by research is, in essence, a management experiment. Therefore, in the absence of empirical information, it cannot be relied on as a management solution. A rigorous monitoring program with built-in adaptive management measures is almost always necessary to achieve the desired outcome.[58] However, the monitoring program established by the RSA lacks rigorous monitoring or adaptive management.

To establish an effective monitoring program, the parameters for monitoring need to reflect the goal(s) of the management action. In this case, Staff's goal is to mitigate Project impacts to Couch's spadefoot toads and their breeding habitat by creating substitute breeding habitat if avoidance is not possible. However, the only established monitoring requirement is to ensure created ponds hold water for at

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[56] Laudenslayer WF Jr, California Department of Fish and Game. 2007. Species Notes for Couch's Spadefoot (*Scaphiopus couchii*): California Wildlife Habitat Relationships (CWHR) System Level II Model Prototype. Available at: nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=7135

[57] RSA. p. C.2-277.

[58] Morrison ML. 2002. Wildlife restoration: techniques for habitat analysis and animal monitoring. Washington (DC): Island Press.

least nine days during the spadefoot toad breeding season.[59] The difference is subtle but extremely significant: the goal is to create substitute breeding habitat, ***not*** to create a pond that holds water for nine days (i.e., not all ponds that hold water for nine days provide breeding habitat). Therefore, Staff must incorporate monitoring that confirms spadefoot toads are breeding in any pond habitat that is created as mitigation.

III. ADDITIONAL DATA IS NECESSARY TO ESTABLISH A COMPENSATORY MITIGATION PLAN

The RSA requires the Applicant to acquire compensation land in order to offset some of the Project's potentially significant impacts to biological resources.[60] However, Staff cannot conclude Project impacts would be fully mitigated by compensatory mitigation until details of the compensation plan have been provided by the Applicant. Such details would, at a minimum, include: the location and environmental qualities associated with the proposed compensation lands; an evaluation of the degree of disturbance, dumping, and historical structures (among other factors) that may require cleaning, fencing, repair, or demolition; the timeframe associated with the aforementioned work (if required) and whether additional lands or monies will be required to off-set the aforementioned impediments; and an evaluation of the threats and limiting factors at the compensation lands, including a discussion of how the threats and limiting factors affect desert tortoise populations and other sensitive biological resources for which the compensation lands are intended.[61]

A monitoring and adaptive management process is necessary to ensure compensation lands fully mitigate Project impacts. The RSA lacks criteria or an enforcement mechanism for this process. To ensure Project impacts are fully mitigated, expectations for long-term monitoring of compensation lands must be incorporated into the impact mitigation plan, including expectations for the establishment of success criteria and the triggers for implementing adaptive management. These expectations should incorporate a timeframe appropriate to the desert ecosystem, baseline and desired conditions of the acquisition site, and the increases in relative abundance that will result from habitat enhancement.

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[59] RSA. p. C.2-277.

[60] RSA, p. C.2-231.

[61] *See, e.g.*, Memorandum from Heather Blair, Energy Commission Staff Biologist (Aspen Environmental Group) to Craig Hoffman, Energy Commission Project Manager, February 5, 2010 regarding Abengoa Mojave Solar – Project time-sensitive issues and informational needs, attached hereto as Attachment 2.

Lastly, desert habitat enhancement costs can be expensive.[62] The cost of comprehensive rehabilitation may exceed $10,000 per acre. In 1999, "modest" rehabilitation techniques implemented to expedite natural recovery reportedly cost $500 to $2,000 an acre.[63] These costs suggest that few habitat enhancement (or protection) measures can be accomplished with Staff's required funding of approximately $330/acre.[64] Although Staff recognizes that actual costs for habitat enhancement may vary,[65] $330/acre does not even come close to the possible $10,000/acre that may be needed.

V. THERE IS NO ASSURANCE THAT COMPENSATORY MITIGATION WILL OFFSET IMPACTS TO SPECIAL-STATUS BATS, AMERICAN BADGER AND KIT FOX

A. Special-Status Bats

According to the RSA,

> The Project site supports foraging and roosting habitat for several special-status bat species. Roosting opportunities for bats are available in tree cavities, soil crevices and rock outcroppings primarily within dry desert wash woodland habitats. Bats likely utilize habitats throughout the study area for foraging but forage more commonly when water is present within the desert washes when insects are more abundant. Implementation of the Project would result in loss of these foraging and roosting habitat opportunities for special-status bats that might occur in the Project area. As discussed in the cumulative impact subsection, staff considers the Genesis Project to be a substantial contributor to the cumulative loss of in the NECO Planning Area's biological resources, including habitat for these special-status bats. Staff's proposed Condition of Certification BIO-12, the desert tortoise compensatory mitigation plan and BIO-22, mitigation for impacts to state waters, would offset the cumulative loss of habitat for these species.[66]

Staff's proposed Condition of Certification BIO-12 and BIO-22 <u>would not</u> necessarily offset the cumulative loss of habitat for special-status bat species. As noted in the RSA, roosting opportunities for bats are available in tree cavities, soil crevices and

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[62] *See* Hailey J, and D Bainbridge. 1999. Desert Restoration: Do something or wait a thousand years? [abstract] Mojave Desert Science Symposium; 1999 Feb 25-27, Las Vegas. USGS, Western Ecological Research Center [internet]. Available from: http://www.werc.usgs.gov/mojave-symposium/

[63] *Id.*

[64] RSA, p. C.2-232.

[65] Id.

[66] RSA, p. C.2-91.

rock outcroppings.[67] The Project would eliminate these roosting habitat opportunities.[68] Because BIO-12 and BIO-22 do not require that compensation lands contain bat roosting substrate (i.e., tree cavities, soil crevices and rock outcroppings), Staff cannot conclude the proposed mitigation would reduce impacts to a less than significant level.

B. American Badger and Kit Fox

Staff concluded the Project would be a substantial contributor to the cumulative loss of the NECO Planning Area biological resources, including American badgers and kit fox. Specifically, the Project would permanently remove approximately 1,811 acres of foraging and denning habitat for American badgers and kit foxes and would fragment and reduce the value of foraging and denning habitat adjacent to the Project site.[69] However, with respect to these two species, Staff was only able to conclude proposed mitigation measures ***could*** offset the loss of habitat and reduce the Project impact to less-than-significant.[70] As a result, Project mitigation needs to be strengthened such that it ***will*** reduce the Project impact to less-than-significant.

VI. MITIGATION FOR POTENTIALLY SIGNIFICANT NOISE IMPACTS ON BIRDS IS INADEQUATE

The RSA requires avoidance of loud construction activities (e.g., unsilenced high pressure steam blowing and pile driving, or other) from February 15 to April 15 when it would result in noise levels over 60 dBA in nesting habitat.[71] Sixty dBA is not a sufficient no-effect threshold. Research on the effects of noise on birds indicates large intra and inter-species variations. [72] Site-specific assessments are therefore necessary to demonstrate site and species-specific thresholds. Because such assessments have not been conducted, the RSA has no basis to conclude noise levels up to 60 dBA would not result in significant impacts to nesting birds.

To the contrary, research on the effects of traffic noise on breeding birds concluded ambient noise up to a given level resulted in no reduction in the density

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[67] RSA, p. C.2-91.
[68] RSA, p. C.2-91.
[69] Id. at p. C.2-92.
[70] RSA, p. C.2-92.
[71] RSA, p. C.2-223.
[72] National Park Service. 1994. Report to Congress: Report on effects of aircraft overflights on the National Park System; Larkin R. 1996. Effects of military noise on wildlife: A literature review. USA CERL Technical Report [internet; cited 28 Sep 2008]. Available from: http://nhsbig.inhs.uiuc.edu/bioacoustics/noise_and_wildlife.pdf; Manci KM, DN Gladwin, R Villella, MG Cavendish. 1988. Effects of aircraft noise and sonic booms on domestic animals and wildlife: a literature synthesis. National Ecology Research Center Report # NERC-88/29.

of bird populations.[73] However, once an ambient noise threshold level was exceeded, densities decreased exponentially with increased noise.[74] Threshold levels were found to range from 36 to 58 decibels, depending on the species.[75] The results of this research were supported by Reijnen et al. (1997), who concluded sound levels above 50 dBA could be considered potentially deleterious to breeding birds. The average distance (from the source of noise) at which an effect was observed in the Reijnen et al. study was reported to be 1,000 m (3,280 feet).[76]

Furthermore, California Partners in Flight (2009) reports the avian breeding season in the Colorado Desert as extending from January 15 to July 15, with peak of egg initiation occurring on April 8.[77] Therefore, the RSA has proposed mitigation for only two of the six months during which Project noise is likely to impact nesting birds. In addition, due to inter-species variation in nesting chronology, Staff's proposed mitigation would be ineffective for some species. For example, the California Department of Fish and Game reports the peak breeding season for prairie falcons (a special-status species that breeds in the Project region)[78] as occurring from April to early August (i.e., generally outside of the dates Staff has required mitigation for noise impacts).[79] Therefore, Staff's proposed mitigation should be revised to require the Applicant to avoid loud construction activities from January 15th to August 15th.

The RSA concluded "[t]he infrequent occasions when construction activities would occur near the project boundary and resultant noise levels would be temporarily elevated beyond 60 dBA surrounding the project would not significantly impact sensitive wildlife."[80] The RSA's conclusion is not supported by scientific literature. In addition, the conclusion contravenes the RSA's discussion of potential Project impacts on golden eagles. Many wildlife species are more susceptible to adverse effects from "startle" due to impulsive noises, rather than "annoyance" due

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[73] Kaseloo PA. 2006. Synthesis of noise effects on wildlife populations. IN: Proceedings of the 2005 International Conference on Ecology and Transportation, Eds. Irwin CL, Garrett P, McDermott KP. Center for Transportation and the Environment, North Carolina State University, Raleigh, NC: pp. 33-35.
[74] Id.
[75] Id.
[76] Reijnen R, R Foppen, G Veenbaas. 1997. Disturbance by traffic of breeding birds: evaluation of the effect and planning and managing road corridors. Biodiversity and Conservation 6: 567-581.
[77] CalPIF (California Partners in Flight). 2009. Version 1.0. The Desert Bird Conservation Plan: a Strategy for Protecting and Managing Desert Habitats and Associated Birds in California. California.
Partners in Flight. http://www.prbo.org/calpif/plans.html.
[78] RSA, p. C.2-44.
[79] California Wildlife Habitat Relationships System. 2005. California Department of Fish and Game. California Interagency Wildlife Task Group. CWHR version 8.1 personal computer program. Sacramento (CA).
[80] RSA, p. C.2-93.

to a change in overall noise levels.[81] In discussing potential Project impacts to golden eagles, the RSA indicated a nestling being knocked from the nest by a *startled* adult would be considered an injury, and a nestling fed inadequately because adults were agitated due to construction-related noise and activity would also be considered substantial interference.[82] Both examples constitute "take" under the Bald and Golden Eagle Protection Act, and thus would be considered a significant impact. Accordingly, appropriate mitigation measures need to be developed to avoid and minimize the adverse effects associated with all Project noise regardless of its duration.

A. The RSA Fails to Establish Existing Conditions for Golden Eagles

The USFWS has established *minimum* inventory and monitoring efforts that "are essential components" to avoiding and minimizing disturbance and other kinds of take of golden eagles.[83] The USFWS reports "[t]hese field efforts are the mutual responsibility of agencies authorizing activities and their permittees."[84]

The RSA indicates that the Applicant participated in funding helicopter surveys for golden eagle nests, but to date the results of the surveys are not available.[85] I concur with the USFWS that inventory data are essential to evaluating the impacts of a proposed activity and for avoiding and minimizing take of eagles. Consequently, data that conform to the minimum inventory requirements specified by the USFWS need to be provided before the RSA's proposed mitigation measures can be evaluated. I reserve the right to provide additional testimony on this topic after the Applicant has provided the requisite golden eagle inventory data.

B. The RSA Fails to Provide Adequate Mitigation for Potentially Significant Project Impacts to Golden Eagles

Staff concluded that Project construction activities could potentially injure or disturb golden eagles if nests were established sufficiently close to Project

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[81] National Park Service. 1994. Report to Congress: Report on effects of aircraft overflights on the National Park System; Larkin R. 1996. Effects of military noise on wildlife: A literature review. USA CERL Technical Report [internet; cited 28 Sep 2008]. Available from: http://nhsbig.inhs.uiuc.edu/bioacoustics/noise_and_wildlife.pdf; Manci KM, DN Gladwin, R Villella, MG Cavendish. 1988. Effects of aircraft noise and sonic booms on domestic animals and wildlife: a literature synthesis. National Ecology Research Center Report # NERC-88/29.
[82] RSA, p. C.2-89.
[83] Pagel JE, DM Whittington, GT Allen. 2010 Feb. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, United States Fish and Wildlife Service. p. 2.
[84] Pagel JE, DM Whittington, GT Allen. 2010 Feb. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, United States Fish and Wildlife Service. p. 2.
[85] RSA, p. C.2-42.

boundaries to be affected by the sights and sounds of construction.[86] However, Staff concluded this impact would be reduced to less than significant levels through implementation of a Golden Eagle Monitoring and Management Plan ("BIO-28"). The triggers identified in this proposed mitigation include "evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment."[87] Adaptive management is an important part of a monitoring program, but the triggers identified by Staff constitute disturbance, which is considered a take and prohibited under the Bald and Golden Eagle Protection Act ("Eagle Act").[88] If Project-related disturbance to golden eagles is a possibility, the Applicant needs to apply for a take permit and receive authorization from the USFWS. Aside from this issue, the adaptive management measures discussed by Staff are *reactive* (i.e., implemented after disturbance has occurred). Given the sensitivity and apparent decline of eagle populations in the West, Staff should require measures that are *proactive* (i.e., designed to avoid a disturbance).

Staff assessed the impacts of the Project to golden eagle foraging habitat, and concluded that the Project would contribute to the cumulative loss of golden eagle foraging habitat within the NECO planning area.[89] In addition, Staff concluded the Project would reduce the availability of foraging habitat in the Project area and could degrade foraging habitat through the introduction and spread of noxious weeds and an increase in human activity in the area.[90] With respect to these impacts, the RSA states:

> The potential for impacts to golden eagle foraging habitat can be minimized by the implementation of staff's proposed Conditions of Certification BIO-12 (acquisition of desert tortoise compensatory mitigation lands), BIO-22 (acquisition of state waters compensatory mitigation lands) BIO-14 (implementation of Weed Management Plan). As described in BIO-12, the acquisition of desert tortoise mitigation lands would be targeted for areas within and near the Chuckwalla Bench and the Chuckwalla DWMA. Because these targeted areas are also within 10 miles of potential nesting sites for golden eagles, acquisition of these desert tortoise mitigation lands would also provide protected golden eagle foraging grounds.[91]

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[86] RSA, p. C.2-89.
[87] RSA, p. C.2-278.
[88] *See* Pagel JE, DM Whittington, GT Allen. 2010 Feb. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, United States Fish and Wildlife Service. p. 2-3.
[89] RSA, p. C.2-90.
[90] RSA, p. C.2-90.
[91] Id.

I have the following comments related to these statements:

First, the RSA has not made any conclusions regarding the significance of Project impacts after the proposed conditions (i.e., BIO-12, BIO-14, and BIO-22) have been implemented. I suspect this is because Staff *cannot* make any conclusions on significance until robust inventory data have been provided. It is my professional opinion that without the inventory data, one cannot conclude the proposed mitigation will reduce potentially significant Project impacts on golden eagles.

Second, acquisition of desert tortoise and state waters within 10 miles of *potential* nesting sites for golden eagles does not necessarily mitigate Project impacts. To help stem the decline in eagle populations, acquisition lands need to be within the foraging territory of *actual* nesting sites.

Third, research indicates golden eagles selectively use available habitat, and that they concentrate their foraging activities in select "core" areas.[92] In a study on spatial use and habitat selection of golden eagles in Idaho, Marzluff et al. (1997) concluded that there was substantial variation in home range size and habitat use among eagles, and that if such variation was ignored (by focusing on population averages), conservation strategies and biological descriptions will be inaccurate and rarely effective.[93] During the breeding season, eagles in Marzluff's study had home ranges as small as 480 acres, with 95% of the activity concentrated in core areas as small as 74 acres.[94] Home range size and behavior were a function of the types and configuration of prey habitat in the vicinity of the nest, and perhaps individual eagles.[95]

The results of this research have two important implications on the Project. First, in the absence of more appropriate empirical data, one should conclude Marzluff's results apply to the Project site, and thus the Project could eliminate a substantial amount of core habitat (perhaps all) used by at least one pair of breeding eagles. Under CEQA guidelines, such an impact is "substantial" and significant. Second, whereas acquisition of compensation land may help conserve foraging habitat for *some* eagle(s), it may be of little consequence to *the* eagle(s) whose core habitat has been eliminated by the Project. This is important because not all eagles contribute equally to maintenance of the population.[96] For example, if all the suitable nest locations are fully-occupied, impacts leading to abandonment of a territory (either through destruction of the nest substrate or through not being re-occupied by either the original nesting pair or a new pair from the floater

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[92] Marzluff JM, ST Knick, MS Vekasy, LS Schueck, TJ Zarriello. 1997. Spatial use and habitat selection of golden eagles in southwestern Idaho. The Auk 114(4):673-687.
[93] Id.
[94] Id.
[95] Id.
[96] US Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take. Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior.

population) may have a significant negative impact to the area population.[97] Available prey base or intra-species competition may be additional relevant factors.[98]

Finally, The USFWS' Interim Golden Eagle Inventory and Monitoring Protocol[99] provides excellent recommendations for avoiding and minimizing take of golden eagles, and strong scientific (and legal) justification for implementing the recommended measures. In lieu of reproducing the content of the recommendations in my testimony, I have provided the USFWS Interim Golden Eagle Inventory and Monitoring Program as Attachment 4 to this testimony. The Commission should implement the recommendations in the USFWS' Interim Golden Eagle Inventory and Monitoring Protocol to conserve the golden eagle population and ensure Project compliance with the Eagle Act.

VIII. THE PROJECT WOULD RESULT IN POTENTIALLY SIGNIFICNAT IMPACTS TO NELSON'S BIGHORN SHEEP, BURROW DEER, AND YUMA MOUNTAIN LION

Nelson's bighorn sheep, burro deer, and Yuma mountain lion are special-status species that occur, or have the potential to occur in the Project area.[100]

A. Nelson's Bighorn Sheep

Staff has concluded that the Project site does not represent significant direct or indirect impacts to bighorn sheep habitat connectivity or foraging.[101] These conclusions were at least in part based on (1) the lack of sign or evidence of Nelson's bighorn sheep during field surveys; and (2) the Project Area not being within a known bighorn sheep corridor as identified in the NECO Plan.[102] These reasons do not provide sufficient rationale to conclude the Project would not cause significant impacts.

Specifically, bighorn sheep are known to opportunistically, and unpredicatably use habitat. Bighorn sheep are a naturally wary animal that is difficult to observe, even when present. Although sign (e.g., fecal pellets, tracks) can be used as an index of presence, the ability to detect it is subject to favorable environmental conditions (e.g., absence of wind, rain, or anthropogenic

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[97] US Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take. Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior.
[98] US Fish and Wildlife Service, Division of Migratory Bird Management. 2009. Final Environmental Assessment, Proposal to Permit Take. Provided Under the Bald and Golden Eagle Protection Act. Washington: Dept. of Interior.
[99] Pagel et al. 2010.
[100] RSA, Biological Resources Table 3.
[101] RSA, p. C.2-92.
[102] RSA, p. C.2-47.

distrubance). Through my own scientific research on the Peninsular bighorn sheep, I have observed abundant bighorn sheep sign at my study site during one week, and a complete lack of sign at the ***same*** study site during the subsequent week following a rain event. Because the Applicant's surveys of the main Project site were conducted within a very narrow timeframe during the spring of 2009, chance alone would dictate a low probability of bighorn sheep detection, even if animals use the site.

In addition, during spring 2009 field surveys, the Applicant reported detecting tracks of burro deer in one location south of I-10 along the southern transmission line route.[103] Burro deer tracks were also reported along the transmission line and buffer area during spring 2010 field surveys.[104] It can be nearly impossible to distinguish deer tracks from bighorn tracks. It's unclear whether Staff considered this fact in formulating the conclusion that bighorn sheep sign were not observed during field surveys.

Without supporting information, the Project Area not being within a known bighorn sheep corridor as identified in the NECO Plan means very little. According to the NECO Plan, "[t]hese areas were mapped during a NECO workshop of several Bighorn Sheep biologists in June of 1997."[105] Additionally, Staff, the Applicant, and BLM have all indicated that the habitat modeling procedures used for the NECO Plan are inferior (in accuracy) to ground-based and field-verified delineation of habitats.[106] Thus, the NECO Plan is not evidence that the Project will not significantly impact bighorn sheep.

Finally, the conclusion presented in the RSA conflicts with the Applicant's conclusion regarding the Project's impacts to bighorn sheep. The Applicant concluded that the cumulative development of foreseeable projects ***would*** result in large-scale habitat loss and fragmentation that would potentially cause significant cumulative impacts to biological resources, including bighorn sheep.[107]

B. Burro Deer

The RSA concluded burro deer movement between the eastern portion of Ford Dry Lake and the Palen Wash ironwood forest would be impacted by the proposed Project.[108] However, the RSA further concluded the impact is not expected to be significant "because the importance of this linkage is already compromised by OHV and other human disturbance from the Wiley Well Rest Stop, and because the western portion of the ROW will be returned to BLM, thus allowing continued

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[103] Id.
[104] Id.
[105] BLM and CDFG. 2002. Final Environmental Impact Statement. Proposed Northern & Eastern Colorado Desert Coordinated Management Plan. Bureau of Land Management, California Desert, Riverside, CA. Appendix H.
[106] RSA, p. C.2-160.
[107] AFC, p. 5.3-33.
[108] RSA, p. C.2-156.

movement upslope into the Palen Wash and Palen Mountain Range from the west."[109]

The RSA's conclusion is contradicted by statements within the RSA itself. First, the RSA states "Ford Dry Lake and Dunes were formerly designated for OHV recreation, but now are closed to vehicles; therefore staff does not anticipate a significant increase in OHV use elsewhere in desert tortoise habitat as a result of the proposed Project."[110] Second, the RSA states "[t]he remote location of the site and the BLM's existing OHV use restrictions limit the direct impacts to these recreation uses."[111] Finally, the RSA states "[t]he GSEP site currently consists of largely undisturbed desert land."[112] Thus, the RSA's conclusion that the Project will not significantly impact burro deer movement is unsupported.

C. Yuma Mountain Lion

The Yuma mountain lion is a California Species of Special Concern. The RSA concluded the Yuma mountain lion likely uses the Project site.[113] However, the RSA lacks any discussion of Project impacts to the species, including whether mitigation is necessary to offset potentially significant impacts.

The Yuma mountain lion is a keystone species (a species that makes an unusually large contribution to community structure or processes).[114] Furthermore, because it regularly travels long distances, it can be used as a focal species in assessing landscape-level connectivity. With respect to the Project's impact on connectivity, the RSA concludes:

> The combined effect of the Project and all existing and probable future projects in NECO on connectivity within Chuckwalla Valley and the Palen-Ford WHMA is significant and thus the Project will contribute, at least incrementally, to a cumulatively considerable effect. The requirement in BIO-20 and BIO-22 to acquire habitat within Chuckwalla Valley and within the identified connectivity linkages would reduce the Project's contribution to cumulative effects to connectivity in Chuckwalla Valley and the Palen-Ford WHMA to a level less than cumulatively considerable.[115] Mitigation for cumulative effects to connectivity could be enhanced if desert tortoise acquisitions were targeted for areas that would enhance wildlife connectivity within the same WHMA and corridor, as described in Biological

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[109] RSA, p. C.2-156.
[110] RSA, p. C.2-195.
[111] RSA, p. C.6-27.
[112] RSA, p. C.6-4.
[113] RSA, p. C.2-61.
[114] Meffe GK, CR Carroll. 1997. Principles of Conservation Biology, 2nd edition. Sinauer Associates, Inc., Sunderland, MA.
[115] RSA, p. C.2-157.

Resources Appendix B. Kit foxes, coyotes, and badgers are not NECO species and were not the reason for the establishment of the WHMAs; however, the acquisition of lands within the connectivity linkages described in Appendix B would also benefit kit fox, coyote, badger, and burro deer.[116]

The rationale used to support the conclusion that Staff's proposed mitigation would reduce impacts to a level less than cumulatively considerable is unsupported for several reasons. First, BIO-20 does not appear to require acquisition of habitat within an "identified" connectivity linkage. Second, BIO-22 does not require acquisition of habitat within the Chuckwalla Valley and within the "identified" connectivity linkages. Third, the RSA ***recommends***, but does not ***require***, the Applicant to acquire lands identified in Biological Resources Appendix B. Finally, the RSA enables the Applicant to satisfy mitigation requirements through fee payment instead of acquiring compensation lands. Thus, significant impacts to connectivity that may occur as a result of the Project remain unmitigated.

IX. THE PROJECT WILL RESULT IN SIGNIFICANT IMPACTS TO MOJAVE FRINGE-TOED LIZARD

The RSA indicates that the Project would indirectly affect 151 acres of Mojave fringe-toed lizard habitat downwind of the Project Disturbance Area.[117] The Applicant disagrees with Staff's assessment of the indirect impacts to Mojave fringe-toed lizard habitat, and asserts that the downwind "sand shadow" area that Staff considered affected by intrusion into the Palen-McCoy Valley Sand Transport Corridor does not provide suitable habitat for Mojave fringe-toed lizards.[118] Although the Applicant's assertion conflicts with the scientific literature,[119] and although the RSA identifies numerous flaws with the Applicant's argument, Staff has indicated it is willing to reconsider conclusions about the suitability of the 151 acres if the Applicant is able to provide additional information.[120] The information in the record clearly indicates the 151 acres in question *are* Mojave fringe-toed lizard habitat. As such, a reversal of Staff's assessment would constitute a remarkable change to the Project description, impact assessment, and mitigation measures. Consequently, I reserve the right to provide additional testimony on this topic once Staff has made a final decision on the issue.

The RSA provides a relatively thorough discussion of the numerous indirect

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[116] RSA, p. C.2-158.
[117] RSA, p. C.2-1.
[118] RSA, p. C.2-75.
[119] *See* Cablk ME, JS Heaton. 2002 Nov. Mojave Fringe-Toed Lizard surveys at the Marine Corps Air Ground Combat Center at Twentynine Palms, California and nearby lands administered by the Bureau of Land Management. California: Marine Corps Air Ground Combat Center. Report M67399-00-C-0005. 115 p.
[120] RSA, p. C.2-76.

impacts of the Project on Mojave fringe-toed lizard habitat. These include mortality from vehicle strikes; introduction and spread of invasive plants; erosion and sedimentation of disturbed soils; fragmentation and degradation of remaining habitat; increased road kill hazard from operations traffic; harm from accidental spraying or drift of herbicides and dust suppression chemicals; and an increase in access for avian predators (such as loggerhead shrikes) due to new perching structures.[121] In addition, the Project's effect on sand transport is expected to gradually eliminate habitat for Mojave fringe-toed lizards in downwind areas.[122] The Mojave fringe-toed lizards in the Chuckwalla Valley are at the southernmost portion of the species range, and the proposed Project could increase the risks of local extirpation of an already fragmented and isolated population.[123]

Staff notes that in many cases, "the anticipated indirect impacts are more significant, or adverse, then the direct loss of habitat."[124] In this case, the Project would result in numerous indirect impacts, which would predictably be severe on Mojave fringe-toed lizard populations. Nonetheless, Staff has recommended a mitigation ratio of only 0.5:1 for indirect impacts to habitat.[125] This ratio needs to be increased to at least 1:1 so that it is commensurate with the predicted impacts and Staff's conclusion on the severity of those impacts.

X. THE PROJECT POSES POTENTIALLY SIGNIFICANT UNMITIGATED IMPACTS TO SPECIAL-STATUS PLANTS

Based on consultation with recognized experts in the flora of the California Desert region, Staff concluded that late season surveys must be conducted to determine the Project's potentially significant impacts to special-status plants.[126] I concur. However, I disagree with Staff's conclusion that the RSA's proposed mitigation will reduce potentially significant impacts to special-status plants.

Without reliable information on the species that occur—and as a result, the level and types of Project impacts on those species—the RSA cannot conclude proposed mitigation would reduce Project impacts to less than significant levels. A conclusion of this nature would rely on the presumption that all impacts can be mitigated to a less than significant level. Such a presumption is unrealistic for two reasons. First, it is difficult to predict the outcomes of surveys due to the new and unexpected discoveries that have been occurring in the desert (and thus the inability to pre-assign mitigation). Second, the flora of the Desert Floristic Province is poorly understood and therefore surveys may yield completely unexpected results that cannot be mitigated by standard conditions.

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[121] RSA, p. C.2-75.
[122] RSA, p. C.2-205.
[123] Id.
[124] RSA, p. C.2-173.
[125] RSA, p. C.2-68.
[126] RSA, p. C.2-101.

The RSA acknowledges these limitations. In reference to plant species that may occur in the location of the proposed Colorado River Substation expansion, it states,

> implementation of the avoidance measures described in these conditions of certification would require site-specific information about the location of proposed project features in relation to sensitive plant species. Staff does not currently have that project-specific information and therefore ***cannot address the feasibility of implementing effective avoidance measures*** as a means of reducing significant impacts.[127]

I agree with Staff's conclusion that it is impossible to determine the feasibility of avoidance measures without the knowing the location of Project features in relation to special status plant species. The location of special status plant species in relation to the Project footprint will be unknown until fall surveys are conducted. As a result, Staff cannot conclude that proposed mitigation will reduce the Project's potentially significant impacts on special-status plants. In addition, I reserve the right to provide additional testimony on this topic once the Applicant has provided the fall survey data necessary to evaluate the feasibility of implementing effective avoidance measures as a means of reducing significant impacts.

X. THE RSA DOES NOT ADEQUATELY ESTABLISH THE BASELINE FOR GROUNDWATER-DEPENDENT VEGETATION COMMUNITIES THAT WILL BE POTENTIALLY IMPACTED BY THE PROJECT

The RSA states that the "study area" supports desert wash dry woodland, a vegetation community characterized by the presence of groundwater-dependent, or "phreatophytic" plant species. Desert dry wash woodlands are designated a special natural community by the California Department of Fish and Game ("CDFG") and the Bureau of Land Management (BLM), and they are designated as Waters of the State.[128] Although the RSA does not clearly define the "study area", it cites to the AFC and suggests that the "study area" refers to the area surveyed for the Project.[129] I searched the Biological Resources section of the AFC[130] and the Biological Resources Technical Report[131] submitted by the Applicant, and neither document defines the study area. For the public and resources agencies to be able to analyze the environmental effects of the Project, the "study area" considered in Staff's analysis needs to be defined.

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[127] RSA, p. C.2-126.
[128] RSA, p. C.2-17.
[129] Id., p. C.2-14.
[130] Genesis Solar Energy Project/T. Bernhardt . (2009) Application for Certification for the Genesis Solar Energy Project. Submitted to California Energy Commission Docket Unit on August 31, 2009.
[131] Genesis Solar Energy Project Biological Resources Technical Report (2009). Prepared by Tetra Tech EC, Inc. August 2009.

The RSA states that the Project pumping impact zone "includes an area extending 2 to 3 miles from the Project pumping well during construction and approximately 10 miles by the end of the Project operation."[132] The RSA depicts a substantial amount of desert wash dry woodland within a 10-mile radius of the Project.[133] Additionally, an old growth desert ironwood (*Olneya tesota*) stand, a documented groundwater-dependent, keystone species[134] within the Sonoran Desert ecosystem, is located approximately five miles north of the Project site.[135] Field data submitted by the Applicant does not indicate that these desert dry wash woodland communities were included in the study area. Therefore, neither the Applicant nor Staff have provided a thorough assessment of the groundwater-dependent vegetation communities that may be affected by the Project.

XI. THE RSA HAS NOT RESOLVED SUBSTANTIAL UNCERTAINTIES REGARDING THE PROJECT'S SHORT- AND LONG-TERM IMPACTS ON GROUNDWATER-DEPENDENT RESOURCES

A. Hydrologic Associations Between Chuckwalla Valley Aquifers and Communities of Groundwater Dependent Vegetation

Throughout the RSA, Staff repeatedly points to the overwhelming uncertainties associated with the Project's predicted influence on groundwater resources and the consequent impacts on groundwater-dependent vegetation communities. The Applicant has used reports by Worley Parsons[136] to support its assertion that groundwater pumping for the construction and operation of the Project will not adversely affect the shallow-water aquifer on which groundwater-dependent plant species rely. While I am not testifying on the scientific findings of these reports, it is pertinent to underscore that both Staff and Worley Parsons have expressed widespread uncertainty in the information that has been presented.

The Applicant asserts that due to geologic formations termed "low permeability layers", Project groundwater pumping from deep aquifers will not affect the shallow alluvial groundwater system that supports phreatophytic communities.[137] However, Staff directly questions the reliability of this claim. The RSA cites Deacon et al (2007) to emphasize that the lack of an adverse effect cannot

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[132] RSA, p. C.2-117.
[133] RSA, Biological Resources Figure 11-B.
[134] Suzan, Humberto, Gary P. Nabhan, and Duncan T. Patten. (1996) The Importance of Olneya tesota as a Nurse Plant in the Sonoran Desert. *Journal of Vegetation Science*, 7(5), 635-644.
[135] RSA, p. C.2-118.
[136] WorleyParsons (2009) *Technical Memorandum - Groundwater Resources Cumulative Impact Analysis for Genesis Solar Power Project*, Riverside County, CA.
[137] RSA, p. C.2-118.

be accurately predicted due to the frequent fracturing of the confining layers.[138] In addition, neither the Applicant nor Staff know which basin aquifer supports the various groundwater-dependent plant communities that occur in the Project region. The RSA reports, "it is uncertain whether the phreatophytes around Ford Dry Lake are supported by the basin aquifer (from which the Project would draw its water) or mountain front aquifer, which the Applicant has stated would be essentially unaffected."[139] Although Staff was willing to provide an unsubstantiated assumption on the groundwater-dependent communities it does not "expect" to be impacted by Project water usage, Staff has admitted that it "has insufficient data on which to base such an assumption."[140] Due to the recognized uncertainty and lack of scientific data, there is no evidence to support the Applicant's conclusion that the Project will not significantly impact groundwater dependent vegetation.

B. Cumulative Impacts on Regional Groundwater Dependent Resources

In addition to the uncertainties associated with the Project's impacts, there are uncertainties associated with the analyses of the cumulative impacts to regional groundwater levels from the operations of multiple independent projects. The Chuckwalla Valley Groundwater Basin, in which the Genesis Project and many other foreseeable projects would be located, has not been thoroughly studied and the hydrological response to increased groundwater pumping is unknown. As stated by Worley Parsons, the various groundwater needs that are projected to increase in the western portion of the basin can have unforeseen consequences on regional hydrology. Specifically, it stated "the western portion of the basin ***may*** be expected to respond differently than the eastern portion of the basin during pumping. Thus, although they are part of the same groundwater basin, a more detailed analysis of these two portions of the basin is warranted."[141] In the RSA, Staff reports it expects that the effects of the proposed Palen project pumping well, located directly to the west of the Genesis Project, "would be greater and be felt as much as a decade sooner than the end-of-operation effects of the Genesis Project."[142] Both statements demonstrate the extreme level of uncertainty associated with this Project, its direct and cumulative impacts to groundwater levels, and the associated ecological ramifications.

C. Ecological Ramifications

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[138] Deacon, JE, AE Williams, C. Deacon Williams, and JE Williams. (2007) Fueling Population Growth in Las Vegas: How large-scale groundwater withdrawl could burn regional biodiversity. *BioScience*, 57(8), 688-698.
[139] RSA, p. C.2-118.
[140] Id., p. C.2-122.
[141] WorleyParsons, 2009 p. 6 (emphasis added).]
[142] RSA, p. C.2-118.

The high level of uncertainty on Project impacts is of utmost importance in an ecosystem already stressed by water shortages and subject to climate change. Water is the most limiting factor to ecosystem health and viability in the Sonoran Desert.[143] Research cited in the RSA indicates, "lowering the local water table from groundwater pumping has also been demonstrated to induce habitat conversions."[144] Thus, not only would the Project have a potentially significant impact on sensitive phreatophytic vegetation communities, but it may also cause landscape conversion that would impact habitat for multiple special-status species that occur in the Project region.[145] The extreme ecological consequences associated with alterations to groundwater resources dictate the need for reliable and accurate data before Project approval.

XII. THE GROUNDWATER-DEPENDENT VEGETATION MONITORING PLAN DOES NOT MITIGATE POTENTIALLY SIGNIFICANT PROJECT IMPACTS

A. Clarification of the Scope of the Groundwater-Dependent Vegetation Monitoring Plan

Because of the considerable uncertainty regarding the impact that the Project's groundwater usage will have on groundwater-dependent vegetation communities, Staff has required the Applicant to prepare and implement a Groundwater-Dependent Vegetation Monitoring Plan ("Monitoring Plan"). The RSA states that the Monitoring Plan "shall focus on areas containing obligate or facultative phreatophytes (mesquite, ironwood, bush seep-wood, palo verde, cat's claw, smoke tree, and tamarisk) in areas that are most likely to be influenced by groundwater (low-lying areas in the basin floor)."[146] By definition, all phreatophytes are influenced by groundwater,[147] and thus to provide proper mitigation all areas with groundwater-dependent communities must be monitored (i.e., not just low-lying areas). This is critical due to the fact that groundwater is not uniform in distribution or extent, pumping impacts on groundwater levels are uncertain, and the impacts become increasingly uncertain with distance from the pump.[148]

B. Weaknesses of Vegetation Monitoring Plan

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[143] Dimmitt, Mark A., "Plant Ecology of the Sonoran Desert Region." http://www.desertmuseum.org/books/nhsd_plant_ecology.php Accessed on 6/17/2010.
[144] RSA, p. C.2-119.
[145] Genesis Solar Energy Project/T. Bernhardt (2009) ; Solar Millennium (2009), *Application for Certification Vol 1 & 2 for the Palen Solar Power Project.* as cited in California Energy Commission 2009.
[146] RSA, p. C.2-272.
[147] Wikipedia contributors. Phreatophyte [Internet]. Wikipedia, The Free Encyclopedia; 2009 Jun 8, 21:45 UTC [cited 2010 Jun 18]. Available from: http://en.wikipedia.org/wiki/Phreatophyte.
[148] RSA, p. C.2-120.

I concur with Staff that the Monitoring Plan requires baseline data prior to the start of groundwater pumping.[149] However, the design of the Monitoring Plan itself is inadequate based upon the minimal information outlined in the RSA. As noted in the RSA, Staff cannot defer the establishment of a plan's performance standards and goals.[150] Specific shortcomings of the Groundwater-Dependent Vegetation Monitoring Plan ("BIO-25") are detailed below:

First, BIO-25 specifies the use of reference monitoring sites as control locations to compare groundwater-dependent communities within the Project impact zone to those unaffected by potential groundwater pumping impacts. However, the RSA establishes few selection criteria for the reference sites. Because hydrological and geological parameters must be consistent between the reference sites and the Project monitoring sites, and because scientific certainty of these parameters is lacking even within the Project area, the selection of reference sites will be extremely problematic and unreliable. As stated by Staff, "the calculations and assumptions used to evaluate potential Project impacts to groundwater levels are imprecise and have limitations and uncertainties associated with them."[151]

Additionally, the RSA does not establish the minimum number of reference sites that need to be included in the study, nor does it establish whether each unique vegetation assemblage in the Project "impact zone" will be represented by reference sites.

Also, in addition to groundwater, numerous other variables may impact plant vigor and health, (e.g., insects, disease, age, slope, aspect and various microclimatic variables). To effectively isolate the effect of groundwater pumping, the Monitoring Plan needs to consider these variables in its analyses. The reference monitoring sites will be critical indicators of adverse impacts from which decisions to take remedial action will be made. They must therefore be incorporated into a much more comprehensive and appropriately designed Monitoring Plan before the Commission makes a decision on the Project. As currently written, the RSA defers preparation of the Plan to the Applicant, after the Energy Commission's final decision. In my opinion, such deferral almost certainly ensures an inadequate plan given the Applicant's insistent argument that the Project would have no effect, and that remedial actions should not be required.[152] As a result, Staff must establish a more rigorous and scientifically defensible study plan that has undergone peer review by the appropriate experts.

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[149] Id., p. C.2-273.
[150] Id., p. C.2-123.
[151] Id., p. C.2-120.
[152] Galati Blek LLP (2010), *Genesis Solar, LLC's Proposed Biology Conditions of Certification Docket No. (09-AFC-8)*. Submitted April 29, 2010.

Second, BIO-25 states that the Monitoring Plan must include field techniques for measuring drought response. While Staff acknowledged that the list of field measurements in the RSA represents a minimum requirement, the list is incomplete and cannot be deemed sufficient. Specifically, the RSA states "Staff ***expects*** that stress to woody species, such as mesquite, from declines in groundwater levels would be detected in measures of plant vigor, such as die-back, long before plant cover changes might be measureable in an aerial photo."[153] ***Expectations*** of stress responses in vegetation that have not yet been thoroughly studied cannot form the basis of a robust scientific monitoring program. Many drought-tolerant species have physiological responses to reduced water availability that are not immediately obvious in changes in plant vigor.[154] Recruitment and reproductive capacities of target species may decline, but not necessarily manifest through obvious changes in plant vigor. Additionally, the beneficial relationship between the groundwater-dependent vegetation species and root mycorrhizae, which are critical to plant and soil health, would be ignored.[155] Specific monitoring protocols that are both robust and supported by the scientific literature must be provided in detail before Staff can conclude the proposed mitigation will reduce impacts to a level considered less than significant.

Finally, the RSA states that the Monitoring Plan must include "a description of the biological and ecological characteristics of groundwater-dependent species and natural communities."[156] This information is a critical component of both the Project description and in determining the adequacy of the Monitoring Plan. As a result, it cannot be deferred until after Project approval. Of significant importance is a prior and robust understanding of site-specific root growth and water acquisition characteristics of all target groundwater-dependent species. A drawdown in groundwater below the effective rooting level can be deleterious, even at modest amounts of 0.3 feet. As stated in the RSA, "when groundwater levels are lowered beyond the normal reach of groundwater-dependent ecosystems, the decline in plant cover and change in species abundance can result in *severe consequences*."[157] The Monitoring Plan should be based on specific and documented physiological data, including the effective rooting level and its relation to the current groundwater table, before data collection for Project impacts on groundwater-dependent vegetation begins. Research conducted by Cooper et al. (2006) indicates that both the magnitude and rate of water table decline can affect

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[153] RSA, p. C.2-118.
[154] Allen, Michael F. and Michael G. Boosalis (1983) Effects of Two Species of VA Mycorrhizal Fungi on Drought Tolerance of Winter Wheat. *New Phytologist*, 93, 67-76.
[155] Cho, Keunho, Heather Toler, Jaehoon Lee, Bonnie Ownley, Jean C. Stutz, Jennifer L. Moore, and Robert M. Auge. (2006). Mycorrhizal Symbiosis and Response of Sorghum Plants to Combined Drought and Salinity Stresses. *Journal of Plant Physiology*, 163, 517-528.
[156] RSA, p. C.2-274.
[157] Id., pp. C.2-118-119 (emphasis added).]

phreatophytic species.[158] Because water usage by the Project will vary during its construction phase and throughout the year, data on the magnitude and rate of water table decline, as well as the relation to the effective rooting level of groundwater-dependent vegetation in the Project area, is necessary before the Monitoring Plan can be considered satisfactory. These data will also be of great importance for remedial action requirements in the event of Project-induced adverse ecological impacts.

XIII. CONDITION OF CERTIFICATION BIO-26, REMEDIAL ACTION FOR ADVERSE EFFECTS TO GROUNDWATER-DEPENDENT BIOLOGICAL RESOURCES, FAILS TO ESTABLISH ADEQUATE REMEDIATION REQUIREMENTS

The proposed remedial action ("BIO-26") for potential adverse impacts on groundwater-dependent vegetation communities fails to address landscape-level ecological disturbances associated with water shortages. Because relocating the well or decreasing its usage are the only required remediation measures, BIO-26 fails to address any realized impacts that may have already occurred as a result of Project pumping (e.g., tree mortality).

Desert ironwood (*Olneya tesota*) and palo verde (*Cercidium* spp.) are extremely important groundwater-dependent keystone species with multiple ecological roles. These species constitute much of the desert dry wash woodland identified within the Project impact zone. Both species are considered "nurse plants" and ecological "modifiers" for their critical associations with desert biodiversity and microclimate regulation. Ironwood is known to be associated with more than 160 plant species and reports indicate up to 424 species of fauna use these trees for refuge, perching and resting.[159] Both ironwood and palo verde are leguminous, and therefore extremely important in soil nitrogen content and nutrient cycling. Therefore, if mortality to groundwater-dependent communities occurs as a result of the Project, the Applicant must provide mitigation to replace the lost functions and values. Indeed, Staff states that in many cases, "the anticipated indirect impacts are more significant, or adverse, then the direct loss of habitat."[160] Despite this conclusion, the RSA fails to provide mitigation for lost functions and values that groundwater-dependent communities clearly provide.

If remedial action is in fact deemed necessary, substantial uncertainty remains regarding the time required for groundwater resources to regain their previous levels. Research conducted by Webb and Leake (2006) shows that even if

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[158] Cooper, David J, John S. Sanderson, David I. Stannard, and David P. Groeneveld. (2006) Effects of Long-Term Water Table Drawdown on Evapotranspiration and Vegetation in an Arid Region Phreatophyte Community. *Journal of Hydrology*, 325, 21-34.
[159] Zuniga-Tovar, B. and H. Suzan-Azpiri (2010) Comparative Population Analysis of Desert Ironwood (Olneya tesota) in the Sonoran Desert, *Journal of Arid Environments*, 74, 173-178.
[160] RSA, p. C.2-173.

groundwater pumpage from well activities stop, outflow from the impacted aquifers would still be reduced until cones of depression from the well refilled.[161] Without clear and well-defined remediation guidelines to address these ecosystem disturbances and potential long-term consequences, BIO-26 is an insufficient and incomplete mitigation strategy.

Sincerely,

Scott Cashen, M.S.
Senior Biologist

[161] Webb, Robert H. and Stanley A. Leake. (2006) Ground-water Surface-water Interactions and Long-term Change in Riverine Riparian Vegetation in the Southwestern United States. *Journal of Hydrology*, 320, 302-323.

ATTACHMENT 1

Scott Cashen, M.S.
Senior Biologist / Forest Ecologist
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In his 17 years in the profession, Scott Cashen has consulted on projects pertaining to wildlife and fisheries ecology, avian biology, wetland restoration, and forest management. Because of his varied experience, Mr. Cashen is knowledgeable of the link between the various disciplines of natural resource management, and he is a versatile scientist.

Mr. Cashen's employment experience includes work as an expert witness, wildlife biologist, consulting forester, and instructor of Wildlife Management. He has worked throughout California, and he is knowledgeable of the different terrestrial and aquatic species and habitats present in the state.

Mr. Cashen is an accomplished birder and is able to identify bird species by sight and sound. His knowledge has enabled him to survey birds throughout the United States and instruct others on avian identification. Mr. Cashen's research on avian use of restored wetlands is currently being used by the United States Fish and Wildlife Service to design wetlands for specific "target" species, and as a model for other restored wildlife habitat monitoring projects in Pennsylvania. In addition to his bird experience, Mr. Cashen has surveyed for carnivores, bighorn sheep, and other mammals; special-status amphibian species; and various fish species.

PROFESSIONAL EXPERIENCE

Litigation Support / Expert Witness

Mr. Cashen serves as the biological resources expert for the San Francisco law firm of Adams Broadwell Joseph & Cardozo. He is responsible for reviewing CEQA/NEPA documents, assessing biological resource issues, preparing written comments, providing public testimony, and interfacing with public resource agencies.

REPRESENTATIVE EXPERIENCE

- Victorville 2 Solar-Gas Hybrid Power Project: Victorville, CA (338-acre natural gas and solar energy facility) – Review of CEQA equivalent documents and preparation of written documents.
- Avenal Energy Power Plant: Avenal, CA (148-acre natural gas facility) – Review of CEQA equivalent documents and preparation of written documents.
- Ivanpah Solar Electric Generating System: Ivanpah, CA (3700-acre solar facility) – Review of CEQA equivalent documents and preparation of written documents.
- Carrizo Energy Solar Farm: San Luis Obispo County, CA (640-acre solar energy facility) – Review of CEQA equivalent documents. Preparation of data requests, comments on Preliminary Staff Assessment, comments on wildlife corridor model

(CEQA equivalent documents).

- Live Oak Master Plan: Hanford, CA (390-acre housing development) – Review of CEQA documents and preparation of comment letter.
- Rollingwood: Vallejo, CA (214-unit housing development) – Review of CEQA documents and preparation of comment letter.
- Columbus Salame: Fairfield, CA (430,000 ft² food processing plant) – Review of CEQA documents and preparation of comment letter.
- Concord Naval Weapons Station: Concord, CA (5028-acre redevelopment) – Review of CEQA documents, preparation of comment letters, and provision of public testimony at County hearings.
- Chula Vista Bayfront Master Plan: Chula Vista, CA (556-acre development) – Review of CEQA documents and preparation of comment letter.
- Beacon Solar Energy Project: California City, CA (2012-acre solar facility) – Review of CEQA equivalent and NEPA documents. Preparation of data requests, comments on Preliminary Staff Assessment, comments on Incidental Take Permit Application. Expert witness providing testimony at California Energy Commission hearings.
- Solar One Power Project: San Bernardino County, CA (8230-acre solar facility) – Review of CEQA equivalent and NEPA documents and preparation of data requests. Expert witness providing testimony at California Energy Commission hearings.
- Solar Two Power Project: Imperial County, CA (6500-acre solar facility) – Review of CEQA equivalent and NEPA documents. Preparation of data requests and other documents for case record. Expert witness providing testimony at California Energy Commission hearings.
- Alves Ranch: Pittsburgh, CA (320-acre housing development) – Review of CEQA documents.
- Roddy Ranch: Antioch, CA (640-acre housing and hotel development) – Review of CEQA documents and preparation of comment letter.
- Aviano: Antioch, CA (320-acre housing development) – Review of CEQA documents.
- Western GeoPower Power Plant and Steamfield: Geyserville, CA (887-acre geothermal facility) – Review of CEQA documents and preparation of comment letter.
- Sprint-Nextel Tower: Walnut Creek, CA (communications tower in open space preserve) - Review of project documents and preparation of comment letter.

Project Management

Mr. Cashen has managed several large-scale and high profile natural resources investigations. High profile projects involving multiple resources often require consideration of differing viewpoints on how resources should be managed, and they are usually subject to intense scrutiny. Mr. Cashen is accustomed to these challenges, and he

is experienced in facilitating the collaborative process to meet project objectives. In addition, the perception of high profile projects can be easily undermined if inexcusable mistakes are made. To prevent this, Mr. Cashen bases his work on solid scientific principles and proven sampling designs. He also solicits input from all project stakeholders, and provides project stakeholders with regular feedback on project progress. Mr. Cashen's educational and project background in several different natural resource disciplines enable him to consult on multiple natural resources simultaneously and address the many facets of contemporary land management in a cost-effective manner.

REPRESENTATIVE EXPERIENCE

- Forest health improvement projects – Biological Resources *(CDF: San Diego and Riverside Counties)*
- San Diego Bark Beetle Tree Removal Project – Biological Resources, Forestry, and Cultural Resources *(San Diego Gas & Electric: San Diego Co.)*
- San Diego Bark Beetle Tree Removal Project - Forestry *(San Diego County/NRCS)*
- Mather Lake Resource Management Study and Plan – Biological Resources, Hydrology, Soils, Recreation, Public Access, CEQA compliance, Historic Use *(Sacramento County: Sacramento)*
- "KV" Spotted Owl and Northern Goshawk Inventory *(USFS: Plumas NF)*
- Amphibian Inventory Project *(USFS: Plumas NF)*
- San Mateo Creek Steelhead Restoration Project – TES species, Habitat Mapping, Hydrology, Invasive Species Eradication, Statistical Analysis *(Trout Unlimited and CA Coastal Conservancy: Orange County)*
- Hillslope Monitoring Project – Forest Practice Research *(CDF: throughout California)*
- Placer County Vernal Pool Study – Plant and Animal Inventory, Statistical Analysis *(Placer County: throughout Placer County)*
- Weidemann Ranch Mitigation Project – Mitigation Monitoring and Environmental Compliance *(Toll Brothers, Inc.: San Ramon)*
- Delta Meadows State Park Special-status Species Inventory – Plant and Animal Species Inventory, Special-status Species *(CA State Parks: Locke)*
- Ion Communities Biological Resource Assessments – Biological Resource Assessments *(Ion Communities: Riverside and San Bernardino Counties)*
- Del Rio Hills Biological Resource Assessment – Biological Resource Assessments *(The Wyro Company: Rio Vista)*

Biological Resources

Mr. Cashen has a diverse background in biology. His experience includes studies of a variety of fish and wildlife species, and work in many of California's ecosystems. Mr. Cashen's specialties include conducting comprehensive biological resource assessments, habitat restoration, species inventories, and scientific investigations. Mr. Cashen has led investigations on several special-status species, including ones focusing on the foothill yellow-legged frog, mountain yellow-legged frog, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, and forest carnivores. Mr. Cashen was responsible for the special-status species inventory of Delta Meadows State Park, and for conducting a research study for Placer County's Natural Community Conservation Plan.

REPRESENTATIVE EXPERIENCE

Avian

- Study design and Lead Investigator - Delta Meadows State Park Special-status Species Inventory *(CA State Parks: Locke)*
- Study design and lead bird surveyor - Placer County Vernal Pool Study *(Placer County: throughout Placer County)*
- Surveyor - Willow flycatcher habitat mapping *(USFS: Plumas NF)*
- Independent surveyor - Tolay Creek, Cullinan Ranch, and Guadacanal Village restoration projects *(Ducks Unlimited/USGS: San Pablo Bay)*
- Study design and Lead Investigator - Bird use of restored wetlands research *(Pennsylvania Game Commission: throughout Pennsylvania)*
- Study design and surveyor - Baseline inventory of bird species at a 400-acre site in Napa County *(HCV Associates: Napa)*
- Surveyor - Baseline inventory of bird abundance following diesel spill *(LFR Levine-Fricke: Suisun Bay)*
- Study design and lead bird surveyor - Green Valley Creek Riparian Restoration Site *(City of Fairfield: Fairfield, CA)*
- Surveyor - Burrowing owl relocation and monitoring of artificial habitat *(US Navy: Dixon, CA)*
- Surveyor - Pre-construction raptor and burrowing owl surveys *(various clients and locations)*
- Surveyor - Backcountry bird inventory *(National Park Service: Eagle, Alaska)*
- Lead surveyor - Tidal salt marsh bird surveys (*Point Reyes Bird Observatory: throughout Bay Area*)

Amphibian

- Crew Leader - Red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog surveys *(USFS: Plumas NF)*
- Surveyor - Foothill yellow-legged frog surveys *(PG&E: North Fork Feather River)*
- Surveyor - Mountain yellow-legged frog surveys *(El Dorado Irrigation District: Desolation Wilderness)*
- Crew Leader - Bullfrog eradication *(Trout Unlimited: Cleveland NF)*

Fish and Aquatic Resources

- Surveyor - Hardhead minnow and other fish surveys *(USFS: Plumas NF)*
- Surveyor - Weber Creek aquatic habitat mapping (*El Dorado Irrigation District: Placerville, CA*)
- Surveyor - Green Valley Creek aquatic habitat mapping *(City of Fairfield: Fairfield, CA)*
- GPS Specialist - Salmonid spawning habitat mapping *(CDFG: Sacramento River)*
- Surveyor - Fish composition and abundance study (*PG&E: Upper North Fork Feather River and Lake Almanor*)
- Crew Leader - Surveys of steelhead abundance and habitat use *(CA Coastal Conservancy: Gualala River estuary)*
- Crew Leader - Exotic species identification and eradication *(Trout Unlimited: Cleveland NF)*

Mammals

- Principal Investigator – Peninsular bighorn sheep resource use and behavior study (*California State Parks: Freeman Properties*)
- Scientific Advisor – Red Panda survey and monitoring methods *(The Red Panda Network: CA and Nepal)*
- Surveyor - Forest carnivore surveys *(University of CA: Tahoe NF)*
- Surveyor - Relocation and monitoring of salt marsh harvest mice and other small mammals *(US Navy: Skagg's Island, CA)*

Natural Resource Investigations / Multiple Species Studies

- Scientific Review Team Member – Member of the science review team assessing the effectiveness of the US Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.

- Lead Consultant - Baseline biological resource assessments and habitat mapping for CDF management units *(CDF: San Diego, San Bernardino, and Riverside Counties)*
- Biological Resources Expert – Peer review of CEQA/NEPA documents (*Adams Broadwell Joseph & Cardoza: California)*
- Lead Consultant - Pre- and post harvest biological resource assessments of tree removal sites *(SDG&E: San Diego County)*
- Crew Leader - T&E species habitat evaluation for BA in support of a steelhead restoration plan *(Trout Unlimited: Cleveland NF)*
- Lead Investigator - Resource Management Study and Plan for Mather Lake Regional Park *(County of Sacramento: Sacramento, CA)*
- Lead Investigator - Wrote Biological Resources Assessment for 1,070-acre Alfaro Ranch property *(Yuba County, CA)*
- Lead Investigator - Wildlife Strike Hazard Management Plan *(HCV Associates: Napa)*
- Lead Investigator - Del Rio Hills Biological Resource Assessment *(The Wyro Company: Rio Vista, CA)*
- Lead Investigator – Ion Communities project sites (*Ion Communities: Riverside and San Bernardino Counties*)
- Surveyor – Tahoe Pilot Project: CWHR validation *(University of California: Tahoe NF)*

Forestry

Mr. Cashen has five years of experience working as a consulting forester on projects throughout California. During that time, Mr. Cashen has consulted with landowners and timber harvesters on best forest management practices; and he has worked on a variety of forestry tasks including selective tree marking, forest inventory, harvest layout, erosion control, and supervision of logging operations. Mr. Cashen's experience with many different natural resources enable him to provide a holistic approach to forest management, rather than just management of timber resources.

REPRESENTATIVE EXPERIENCE

- Lead Consultant - CDF fuels treatment projects *(CDF: San Diego, Riverside, and San Bernardino Counties)*
- Lead Consultant and supervisor of harvest activities – San Diego Gas and Electric Bark Beetle Tree Removal Project *(SDG&E: San Diego)*
- Crew Leader - Hillslope Monitoring Program *(CDF: throughout California)*
- Consulting Forester – Inventory and selective harvest projects *(various clients throughout California)*

EDUCATION / SPECIAL TRAINING

M.S. Wildlife and Fisheries Science, The Pennsylvania State University (1998)

B.S. Resource Management, The University of California-Berkeley (1992)
Forestry Field Program, Meadow Valley, California, Summer (1991)

PERMITS

U.S. Fish and Wildlife Service Section 10(a)(1)(A) Recovery Permit for the Peninsular bighorn sheep

CA Department of Fish and Game Scientific Collecting Permit

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

The Wildlife Society

Society of American Foresters

Mt. Diablo Audubon Society

OTHER AFFILIATIONS

Scientific Advisor and Grant Writer – *The Red Panda Network*

Scientific Advisor – *Mt. Diablo Audubon Society*

Grant Writer – *American Conservation Experience*

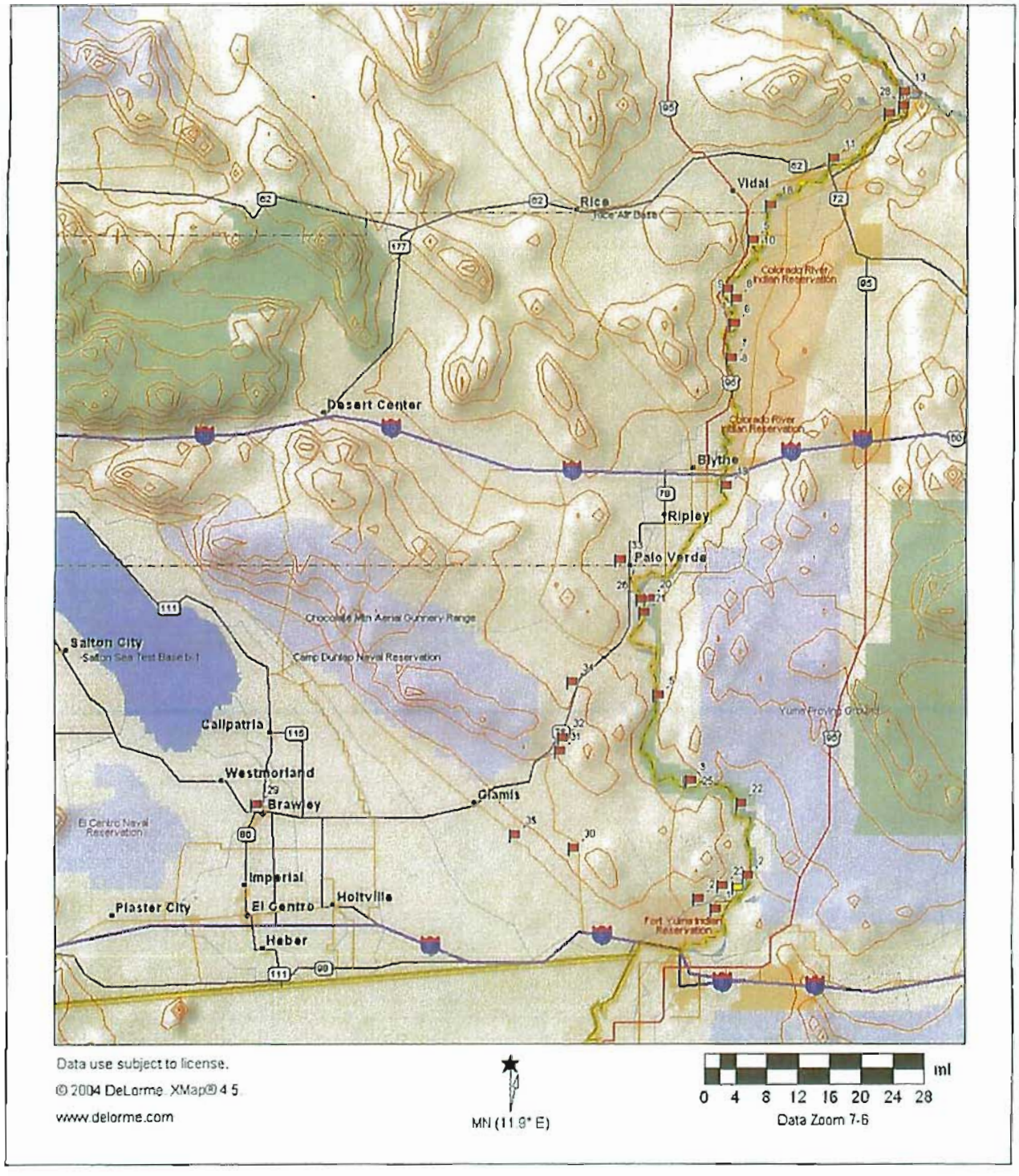
Land Committee Member – *Save Mt. Diablo*

TEACHING EXPERIENCE

Instructor: Wildlife Management, The Pennsylvania State University, 1998

Teaching Assistant: Ornithology, The Pennsylvania State University, 1996-1997

ATTACHMENT 2



Attachment 2. Documented occurrences of Gila woodpeckers (red flags).[1] Flag numbers correspond with CNDDB occurrence numbers.

[1] From California Natural Diversity Database. 2009. Rarefind [computer program]. Version 3.1.0. Mar 2, 2010. Sacramento (CA): Wildlife & Habitat Data Analysis Branch. California Department of Fish and Game.

ATTACHMENT 3

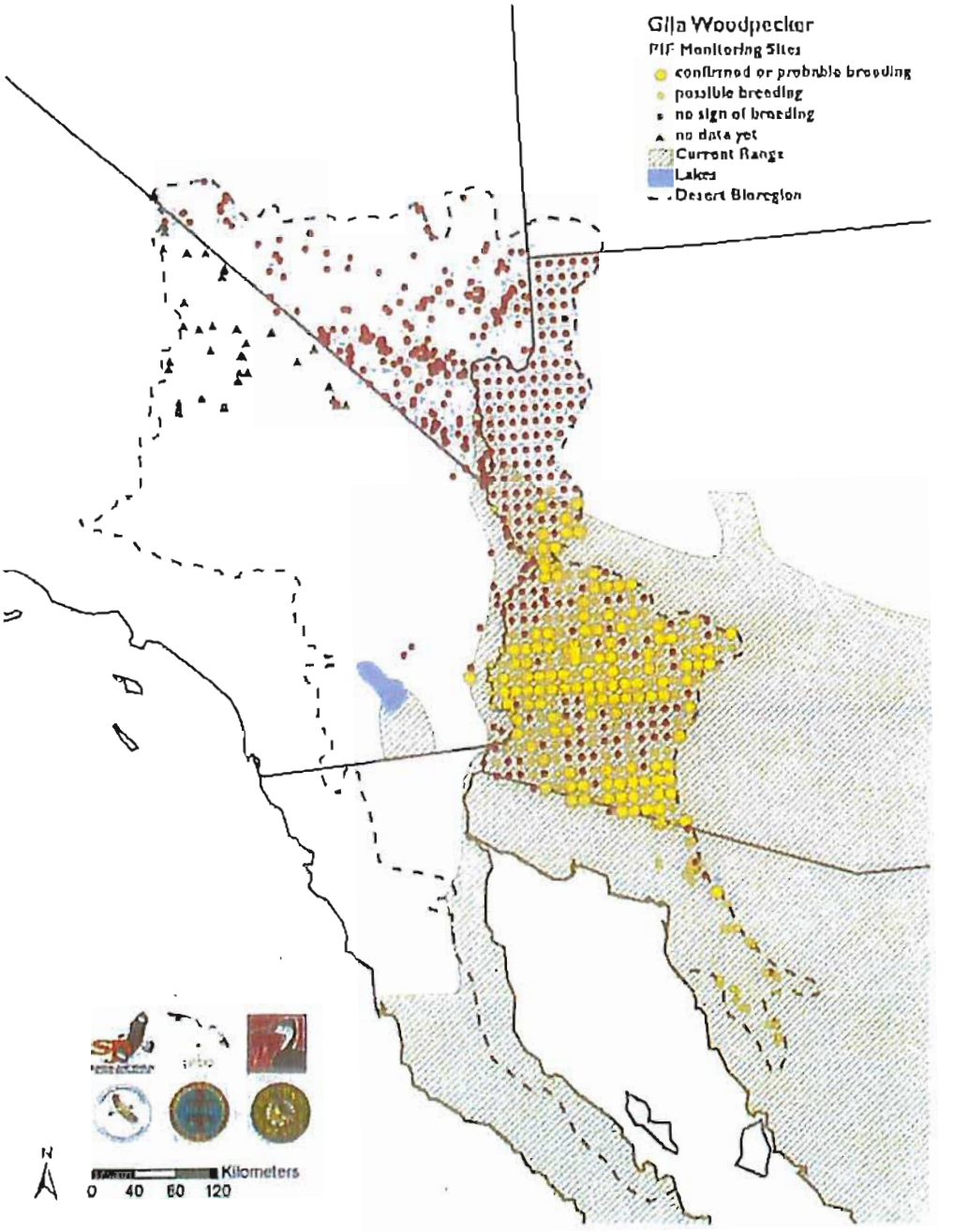


Figure 5-3. CalPIF monitoring sites, breeding status, and current range for the Gila Woodpecker in California.

ATTACHMENT 4

Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations

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U.S. Fish and Wildlife Service

February, 2010

[1] Division of Migratory Birds, U.S. Fish and Wildlife Service

Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations

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Recommended citation:

Pagel, J.E., D.M. Whittington and G.T. Allen. 2010. Interim Golden Eagle Inventory and monitoring protocols; and other recommendations. Division of Migratory Birds, U.S. Fish and Wildlife Service.

I. Purpose

This document identifies the minimum inventory and monitoring effort recommended for determining and evaluating potential Golden Eagle (*Aquila chrysaetos canadensis*) use of habitat including nest sites, roosts, and territories, as well as the rationale for identifying and evaluating foraging locations during breeding and non-breeding periods. It also outlines the minimum monitoring techniques to ascertain occupancy and reproductive success at territories. These field efforts are the mutual responsibility of agencies authorizing activities and their permittees (i.e. action agency; see Glossary). They are essential components for avoiding and minimizing disturbance and other kinds of take, including lethal take, and are a necessary component of short and long-term site specific monitoring and management of local Golden Eagles and regional Golden Eagle populations. The data gathered will provide information on the baseline circumstances for evaluation of permit applications and foundation for permit conditions, as well as assist planners so they may conduct informed impact analyses and mitigation during the National Environmental Policy Act (NEPA) process. Data collected via this effort will also help:

1. Determine the fate and reproductive trends of regional nesting populations via collating information from observed territories.
2. Document and list historical and unsurveyed habitat for future analysis to assist in determining local and regional population trajectories.
3. Provide information to document whether local Golden Eagle conservation efforts are meeting goals for improvements in the status of Golden Eagle.
4. Provide a foundation for evaluation of whether and which activities or conditions may be affecting Golden Eagle.

II. Background

Golden Eagles are protected by the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act (Eagle Act), which both Acts prohibit take. Take means *pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest,* or *disturb*. When the Bald Eagle was delisted under the Endangered Species Act (ESA), and in order to improve management of both species of eagles under the Eagle Act, the U.S. Fish and Wildlife Service (Service) undertook a series of management actions, including:

- **Codifying a regulatory definition of "disturb"** under the Eagle Act (see 72 FR 31132, June 5, 2007). *Disturb* means to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1)

injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

- Proposing permit regulations to (1) Create a new permit type to authorize take of Bald Eagles and Golden Eagles that is associated with, but not the purpose of, the activity; and (2) Create a second new permit type to authorize purposeful take of eagle nests that pose a threat to human or eagle safety (subsequently broadened to accommodate additional circumstances). The regulations were finalized on September 11, 2009 (74 FR 43686).

Summary of the new regulations.

Permits issued under 50 CFR § 22.26 authorize take of Bald Eagles and Golden Eagles, where the take is associated with, but not the purpose of the activity, and cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance; however, permits may authorize lethal take that results from, but is not the purpose of, an otherwise lawful activity. Purposeful take will not be authorized under § 22.26.

The second new permit regulation, at 50 CFR 22.27, establishes permits for removing eagle nests where (1) necessary to alleviate a safety hazard to people or eagles, (2) necessary to ensure public health and safety, (3) the nest prevents the use of a pre-existing human-engineered structure, or (4) the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests during the non-breeding season may be taken, except in the case of safety emergencies.

Regulations under § 22.27 authorize removal and/or relocation of active and inactive eagle nests in cases where genuine safety concerns for people, eagles, or both, necessitate the take. Examples include: (1) a nest tree that appears likely to topple onto a residence; (2) at airports to avoid collisions between eagles and aircraft; and (3) to relocate a nest built within a reservoir that will be flooded.

Both regulations are provided for by the Eagle Act which gives the Secretary of the Interior the authority to permit the limited take of Bald Eagles and Golden Eagles "for the protection of . . . other interests in any particular locality." Additionally, both new regulations:

- Are applicable to Golden Eagles as well as Bald Eagles.
- Authorize take only where it is compatible with the preservation of the eagle. For purposes of these regulations, "compatible with the preservation of the Bald Eagle

and the Golden Eagle" means consistent with the goal of stable or increase of breeding populations.

- Authorize take only where it cannot practicably be avoided.
- Include provisions for programmatic take. Programmatic take (take that is recurring and not in a specific, identifiable timeframe and/or location) will be authorized only where it is unavoidable despite implementation of comprehensive measures developed in cooperation with the Service to reduce the take below current levels.

Additional needs for Golden Eagle information and evaluation.

As part of an adaptive management approach to the permits and eagle management, the Service will assess, at least every five years, overall population trends along with annual report data from permittees and other information to assess how likely future activities are to result in the loss of one or more eagles, a decrease in productivity of Golden Eagles, and/or the permanent loss of a nest site, territory, or important foraging area. Therefore, implementation of the new permit regulations will entail requirements for cumulative effects analyses and identifying the impacts of an activity. We include them here to provide the context and framework for the protocols and recommendations in this document.

Cumulative effect considerations.

Whether the take is compatible with eagle preservation includes consideration of the cumulative effects of other permitted take and additional factors affecting eagle populations. Cumulative effects are defined as: *"the incremental environmental impact or effect of the proposed action, together with impacts of past, present, and reasonably foreseeable future actions"* (50 CFR 22.3). Numerous relatively minor disruptions to eagle behaviors from multiple activities, even if spatially or temporally distributed, may lead to disturbance that would not have resulted from fewer or more carefully sited activities. The accumulation of multiple land development projects or siting of multiple infrastructures that are hazardous to eagles can cumulatively reduce the availability of alternative sites suitable for breeding, feeding, or sheltering, resulting in a greater than additive risk of take to eagles.

To ensure that impacts are not concentrated in particular localities to the detriment of locally-important eagle populations, cumulative effects need to be considered at the population management level—*Service Regions* for Bald Eagles and *Bird Conservation Regions* for Golden Eagles—and, especially for project-specific analyses, at local area population levels (the population within the average natal dispersal distance of the nest or nests under consideration). Eagle take that is concentrated in particular areas can lead to effects on the larger management population because 1) disproportionate take in local populations where

breeding pairs are 'high' producers may reduce the overall productivity of the larger population; and 2) when portions of the management population become isolated from each other the productivity of the overall management population may decrease.

~~Identifying the Impacts of the Activity~~

The applicant for an Eagle Act permit (who can be a project proponent or the agency preparing the NEPA), has four subtasks to determine the likely effects of a project or activity on eagles:

a. Collection and synthesis of biological data. The applicant is responsible for providing up-to-date biological information about eagles that breed, feed, shelter, and/or migrate in the vicinity of the activity that may potentially be affected by the proposed activity. Biological information can include locations and distribution of nests, delineation of territories, prey base, general composition and relative abundance, and productivity data.

b. Identifying activities that are likely to result in take. As part of the permit application, the applicant must include a complete description of the actions that: (1) are likely to result in eagle take, and (2) for which the applicant or landowner has some form of control. For most applications, the activity will be specific and well-defined (e.g., home construction; water use development) or land use activity (e.g., forestry). For larger-scale permits, applicants will need to determine the extent of impacts they want to include in the permit authorization and, if necessary, which ones they wish to exclude.

c. Avoidance and minimization measures. Applications for a § 22.26 permit must document the measures to which the applicant will commit to avoid and minimize the impacts to eagles to the maximum degree practicable.

d. Quantifying the anticipated take. The amount of take to be authorized under a permit depends on a variety of factors, including: (1) the number of eagles that breed, feed, shelter, and or migrate within the activity area, (2) the degree to which the eagles depend on that area for breeding, feeding, or sheltering, or migration, and thus are more likely to be present and affected, (3) the potential of that type of activity in general to take eagles, (4) the scale of the activity, and (5) the measures the applicant will undertake to avoid and minimize the take.

Federal agencies have additional responsibilities to Golden Eagles under Executive Order 13186 (66 FR 3853, January 17, 2001), which reinstated the responsibilities of Federal Agencies to comply with the Migratory Bird Treaty Act of 1918. The Executive Order establishes a process for Federal Agencies to conserve migratory birds by avoiding or minimizing unintentional take and taking actions that benefit species to the extent practicable. Agencies are expected to take

reasonable steps that include restoring and enhancing habitat. Environmental analyses of Federal actions required by NEPA or other environmental review processes must evaluate the effects of actions and Federal agency plans on migratory birds, including Golden Eagles.

Golden Eagle populations are believed to be declining throughout their range in the contiguous United States (Harlow and Bloom 1989, Kochert and Steenhof 2002, Kochert et al. 2002, Good et al. 2007, Farmer et al. 2008, Smith et al. 2008, 74 FR 46836-46879). The Service has modeled current data (USFWS 2009, Appendix C), employing Moffat's equilibrium (Hunt 1998) and Millsap and Allen's (2006) analysis of anthropogenic demographic removal, and estimated that the floating (non-breeding and surplus) component of the Golden Eagle population in some areas may be limited at this time. Data from the Western EcoSystems Technology Inc. surveys from 2006 – 2009 may suggest a decline since 2006 in the total Golden Eagle population within the area covered by the surveys (Nelson et al. 2010, USFWS 2009, Appendix C). Significant Golden Eagle breeding failures have been reported in some areas of the southwestern United States (WRI 2009), and declines in counts of migratory Golden Eagles have been reported in most areas in the western United States (Farmer et al. 2008, Smith et al. 2008), although it is unclear if the latter is linked to a decrease in the number of eagles.

III. Management Need

Prior to initiating inventory and monitoring efforts, land management agencies and/or proponents of land use activities should first assess all existing recent and historical data available on eagles, including their nests, reproductive activity and chronologies, natal dispersal, pertinent data from VHF and satellite telemetry, winter roosts, migration corridors, and foraging habitats contained by and within 4 - 10 + miles of areas slated for development or authorizations for increased human activity. This background search of available information may yield few data, but is necessary to alert project proponents and regulatory staff about data gaps, and existing knowledge of Golden Eagle for that area. Inventory, monitoring, and research activities may then be identified and funded to fill in site specific information gaps to avoid take of Golden Eagle. Specific recommendations for the number of years needed for baseline data and measures to avoid take should be developed in coordination with the Service, and, to reduce redundancy between management and permitting requirements, consistent with permit requirements outlined in the Draft Implementation Guidelines for the new rules (available fall 2010).

Projects in Golden Eagle breeding home ranges on federal, state, and private land possibly will have direct, indirect, and cumulative effects associated with or exacerbated by, factors such as: recreation disturbance, electrocution, urbanization, illegal shooting, invasive species altering prey densities, lead poisoning, other contaminants, climate change, and prolonged drought

which affects predator and prey abundance and distribution. In many cases, existing data may not be adequate for NEPA, planning, or permitting purposes. Therefore, inventory and subsequent monitoring of Golden Eagles and components of their habitats are important to 1) develop a baseline prior to project planning and prior to project development in Golden Eagle habitat, 2) analyze impacts to the species, 3) continue to evaluate and report on the effects of the action and mitigation on Golden Eagles, 4) essential to adaptive management approaches, and 5) provide information that may be required for permits.

Project design, type, and siting of project footprint and infrastructure are critical to avoid disturbance and take of Golden Eagle. In the Final Environmental Assessment on the rule and in the draft Implementation Guidance, the Service recommends that when planning locations of infrastructure and project boundaries, action agencies and project proponents consider life-history components such as productivity, age-class survival, dispersal, migration, winter-concentration behavior, and foraging behavior during breeding and non-breeding seasons in a concerted effort to avoid lethal take. The Service recommends use of the best available or gathered information applicable to the location of the project or plan, but also encourages efforts to conduct further research. For permitting purposes however, and to determine the likelihood and magnitude of take, as well as effectiveness of mitigation, monitoring will need to yield productivity information.

Note: This document does not address site specific observations for transitory and wintering eagles; these protocols will be forthcoming. Although the life history for transitory and wintering eagles is not discussed at length here, that does not imply a lack importance for site-specific observations from the Service's perspective. The document provides general recommendations for factors to consider outside nesting, until more specific protocols are developed.

IV. Basic Golden Eagle Ecology

This account is not intended as a compendium of Golden Eagle natural history, biology, ethology, or ecology; please refer to Watson (1997), Palmer (1988) and Kochert et al. (2002) for more detailed information.

Where they exist, Golden Eagles are an upper-trophic aerial predator, and eat small to mid-sized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups (Bloom and Hawks 1982). They also are known to scavenge and utilize carrion (Kochert et al. 2002)

Golden Eagles nest in high densities in open and semi-open habitat, but also may nest at lower densities in coniferous habitat when open space is available, (e. g. fire breaks, clear-cuts, burned areas, pasture-land, etc.). They can be found from the tundra, through grasslands,

woodland-brushlands, and forested habitat, south to arid deserts, including Death Valley, California (Kochert et al. 2002). Historically, Golden Eagles bred in the Plains and Great Lake states. Golden Eagles currently breed in and near much of the available open habitat in North America west of the 100th Meridian, as well as in eastern United States in the northern Appalachian Mountains (Palmer 1988, Kochert et al. 2002). Lee and Spofford's (1990) review of the literature for the eastern portion of the United States suggests historical nesting Golden Eagles south of New York in the Appalachians was unlikely. Nesting of introduced Golden Eagles have been reported in Tennessee and northwestern Georgia (Kochert et al. 2002), however it is currently unknown if these territories are still extant.

A nesting territory for the purpose of this monitoring protocol has been previously defined by Steenhof and Newton (2007), i.e. an area that contains, or historically contained, one or more nests within the home range of a mated pair: a confined locality where nests are found, usually in successive years, and where no more than one pair is known to have bred at one time.

Golden Eagles avoid nesting near urban habitat and do not generally nest in densely forested habitat. Individuals will occasionally nest near semi-urban areas where housing density is low and in farmland habitat; however Golden Eagles have been noted to be sensitive to some forms of anthropogenic presence (Palmer 1988). Steidl et al. (1993) found when observers were camped 400 meters from nests of Golden Eagles, adults spent less time near their nests, fed their juveniles less frequently, and fed themselves and their juveniles up to 67% less food than when observers were camped 800 meters from nests. In studies of Golden Eagle populations in the southwest (New Mexico and Texas) and the Front Range of the Rocky Mountains (New Mexico, Colorado and Wyoming), Boeker and Ray (1971) reported that human disturbance accounted for at least 85% of all known nest losses. Breeding adults are sometimes flushed from the nest by recreational climbers and researchers, sometimes resulting in the loss of the eggs or juveniles due to nest abandonment, exposure of juveniles or eggs to the elements, collapse of the nest, eggs being knocked from the nest by startled adults, or juveniles fledging prematurely. However, Golden Eagles rarely flushed from the nest during close approaches by fixed-wing aircraft and helicopters during various surveys in Montana, Idaho, and Alaska (Kochert et al. 2002).

Golden Eagles nest on cliffs, in the upper one third of deciduous and coniferous trees, or on artificial structures (windmills, electricity transmission towers, artificial nesting platforms, etc.; Phillips and Beske 1990, Kochert et al. 2002). Golden Eagles build nests on cliffs or in the largest trees of forested stands that often afford an unobstructed view of the surrounding habitat (Beecham 1970, Menkens and Anderson 1987). Usually, sticks and soft material are

added to existing nests, or new nests are constructed to create a strong, flat or bowl shaped platform for nesting (Palmer 1988, Watson 1997, Kochert et al. 2002). Sometimes Golden Eagle will decorate multiple nests in a single year; continuing to do so until they lay eggs in the selected nest. The completed nest structure(s) can vary from large and multi-layered; or a small augmentation of sticks in caves with little material other than extant detritus (Ellis et al. 2009). Each Golden Eagle territory may have anywhere from 1 to 14 alternative nests, with 1 to 6 nests per territory being the norm (Palmer 1988, Watson 1997, Kochert et al. 2002).

Onset of courtship and nesting chronology

Courtship for Golden Eagles involves stick-carrying, display flights, and vocalization (Ellis 1979, Kochert et al. 2002). Golden Eagles partake in undulating flight, however undulating flight has been observed year- round and is thought to be associated more with aggression and territory defense than with courtship (Newton 1979, Harmata 1982, Collopy and Edwards 1989, Watson 1997).

Nesting chronologies vary however there are some generalities. In California and in Texas, courtship at territories start in mid to late December (Palmer 1988, Hunt et al. 1997, D. Bittner pers. com); in Texas eggs have been detected as early as November (Olberholser and Kincaid 1974, *in lit.*). In Utah, courtship can commence in January. In northern tier states at upper latitudes and higher elevation sites, egg laying can occur as early as February and March, before late winter snows and storms have abated (Palmer 1988).

Golden Eagles lay 1 to 4 eggs, with 4 egg clutches rare. Most nests have 2 eggs. The laying interval between eggs ranges between 3 to 5 days. Incubation commences as soon as the first egg is laid, and hatching is asynchronous and can begin as early as late January in southern California (Dixon 1937, Hickman 1968), mid April to late May in southwest Idaho (Kochert et al. 2002) and late March–early May in central and northern Alaska (McIntyre 1995, Young et al. 1995; Fig. 3). In Texas, eggs have been noted from November to June (Oberholser and Kincaid 1974, in lit.). In the northeast United States, eggs have been laid in March/April (Palmer 1988). For more detail, please refer to Kochert et al. 2002 (Appendix 2).

Migration and Wintering

Golden Eagles will migrate from the Canadian provinces and northern tier and northeastern states to areas that are milder in the winter and/or may have less snow cover. Wintering Golden Eagles have been noted in all states in the continental U.S. (Wheeler 2003, 2007). Some segments of the population are non-migratory, and can be found near their nest sites throughout the year. See Kochert et al. 2002 for detailed listing of winter range.

Roosts or gathering behavior

Golden Eagles are not known to roost communally as is common with wintering Bald Eagles in some areas of the United States, but will gather together if local food sources are abundant. A caveat to this is that Golden Eagles have perched with bald eagles where there have been large concentrations of waterfowl or carrion (Palmer 1988).

V. Golden Eagle Responses to Disturbance

Golden Eagles, as with other raptors, visibly display behavior that signifies disturbance when they are stressed by anthropogenic activities; whether it is a lone hiker walking 1000 meters or more from a nest, or extended construction or recreation activities 2000 – 5000 meters from a territory. These postures, movements and behaviors can be overt. However with Golden Eagles, disturbance behaviors are often subtle and require an experienced observer. Olendorff (1971), Fyfe and Olendorff (1976), and Olsen and Olsen (1978) identified considerations when human interactions may disturb nesting activities, and how to ascertain critical distances to avoid agitating nesting, roosting, and foraging raptors. Factors affecting critical distances included:

a. Mannerisms of intruder.

b. Size of intruder.

c. Stage of breeding cycle.

d. Topography and exposure of intruder in relation to bird.

Golden eagle behavior varies among individuals and can be affected by previous experiences. However, some behavioral generalities relative to direct and indirect disturbance include the following:

- Agitation behavior (displacement, avoidance, and defense)
- Increased vigilance at nest sites
- Change in forage and feeding behavior
- Nest site abandonment

Of the preceding behaviors, nest-site abandonment can be readily identified as constituting take under the Eagle Act, as it is specifically cited in the definition of 'disturb'. The other behaviors, when considered cumulatively, may be evidence that activities are interfering with normal breeding behavior and are likely to lead to take. Human intrusions near Golden Eagle

nest sites have resulted in the abandonment of the nest; high nestling mortality due to overheating, chilling or desiccation when young are left unattended; premature fledging; and ejection of eggs or young from the nest (Boeker and Ray 1971, Suter and Joness 1981).

VI. Overall Objectives of the Golden Eagle Survey Protocol

This survey protocol is intended to standardize procedures to inventory and monitor Golden Eagles within the direct and indirect impact area of planned or ongoing projects where disturbance or lethal take from otherwise permitted human activities is possible. This protocol will; 1) identify eagle use areas, 2) identify and minimize potential observer-related disturbance to Golden Eagles by surveys when conducted by qualified and experienced raptor biologists.

Additionally, data collected using this protocol may be used for, at a minimum, 1), sampling other geographic areas where suitable habitat may be present; 2) short and long-term analysis of Golden Eagle occupancy and productivity at known nest sites, and historical locations where observation to determine occupancy maybe necessary; 3) identification and evaluation of potential disturbance factors. If followed, this protocol will standardize data collection for potential local and regional analysis of long-term occupancy, productivity and eagle use trends. This protocol was developed as minimum standards, and as such may require additional area-specific detail if used for research purposes.

Objectives of inventory and monitoring

The first objective of these surveys is to provide methods to identify areas occupied by Golden Eagles and select factors their behavior ecology. Additional objectives of these surveys include:

1. Record and report occupancy and productivity of local Golden Eagle territories.
2. Document and list historical and unsurveyed habitat for future analysis to assist in determining local and regional population trajectories.
3. Determine nesting chronologies.
4. Provide information to document whether local Golden Eagle conservation efforts are meeting goals for improvements in the status of Golden Eagles or meeting permit conditions.
5. Provide a foundation to evaluate whether and which activities or conditions may be affecting Golden Eagles.

6. Document foraging behavior, diet and habitat use within breeding and non-breeding home ranges.

VII. Inventory Techniques

CAUTION

Golden Eagles are one of several cliff and tree dwelling species sensitive to human disturbance. Monitoring eagles in a manner that 'disturbs' them, and causes them to be 'agitated or bothered' can cause nesting failure, and permanent site abandonment, constituting take under the Eagle Act.

These monitoring protocols should facilitate observer caution and identify techniques that will minimize potential for take of Golden Eagles. For additional information regarding preventing observer disturbance while surveying raptors, please refer to Fyfe and Olendorff (1976).

Inventory

Inventories for Golden Eagles should occur if nesting, roosting, and foraging habitat are contained within the project boundary and exist within 4 – 10 air miles from the project boundary. Local and regional Golden Eagle habitat variability will dictate the distance from the project boundary where surveys will occur; distances will be greater in xeric (arid) habitat, or where local prey may not be abundant. The Service will be basing its site-specific evaluations and final determinations on local conditions, not national averages.

Nesting habitat

This account is not intended as a compendium of Golden Eagle habitat available and used in North America; please refer to Palmer (1988) and Kochert et al. (2002) for more detailed information.

Golden Eagles use a wide variety of habitat throughout North America. Small xeric mountain ranges in the Mohave and Great Basin deserts, forested habitat in the Pacific coastal, southern desert, Great Basin, Rocky, Sierra, and Cascade Mountain ranges are also key nesting areas. Local and regional variation of nesting habitat should be considered prior to surveys; however should include cliff, desert scrub, juniper woodland, and forested habitat. For example, in the northern Great Basin, Golden Eagles nest on cliff and in scrub-forest habitat; surveys of both types of substrates are urged prior to projects that have a potential to affect eagles. Identification criteria for nesting habitat at the local scale should take place in coordination with the Service, State, or Tribal wildlife agencies, and raptor experts.

VII.a. Procedures for aerial and ground inventory and monitoring surveys

Golden Eagles generally show strong fidelity to the nesting area annually. Occupancy determination is the most important goal of nest searches. Considerable suitable habitat exists in western North America which has never been adequately surveyed. Inventory surveys should examine habitat where Golden Eagles are not currently known to exist but habitat may be present, as well as previously inventoried areas to detect new activity. Monitoring surveys examine all historical and extant territories where Golden Eagles have been detected either previously or in the current survey.

A nesting territory or inventoried habitat should be designated as unoccupied by Golden Eagles ONLY after at least 2 complete aerial surveys in a single breeding season. In circumstances where ground observation occurs, at least 2 ground observation periods lasting at least 4 hours or more are necessary to designate an inventoried habitat or territory is unoccupied as long as all potential nest sites and alternate nests are visible and monitored. These observation periods should be at least 30 days apart for inventory, and at least 30 days apart for monitoring of known territories. Intervals between observations at occupied nesting territories may need to be flexible and should be based on the behavior of the adults observed, the age of any young observed, and the data to be collected (see below, Section IX). Dates of starting and continuing inventory and monitoring surveys should be sensitive to local nesting (i.e. laying, incubating, and brooding) chronologies, and would be conducted during weather conditions favorable for aerial survey and/or monitoring from medium to long range distances (+ 300 – 700 meters).

The first inventory and monitoring surveys should be conducted during courtship when the adults are mobile and conspicuous. When survey of historical territories is conducted, observers should focus their search on known alternative nests, and also carefully examine the habitat for additional nests which may have been overlooked or recently constructed. A 'decorated' nest will be sufficient evidence to indicate the probable location of a nesting attempt. If a decorated nest or pair of birds is located, the search can then be expanded to inventory likely habitat adjacent to the discovered territory to see if additional golden eagle territories can be observed.

Note: Identification of alternate nests will be required by the Service for determination of relative value of individual nests to a territory in cases of applications for permits to take 'inactive' nests, and when determining whether abandonment of a particular nest is likely to result in abandonment of a territory. The Service has determined that territory loss or permanent abandonment of a territory is a greater impact to populations than temporary abandonment of a nest.

Weather: Avoid searching potential and known nesting locations during periods of heavy rain, snow, high winds, or severe cold weather. Golden Eagles should not be induced to flush at any time during the survey period. Flushing when the adults are incubating or have small young can be particularly hazardous for successful nesting, and could constitute lethal disturbance take. High temperatures also may cause problems for successful viewing over long distances due to heat waves. Further, observer related incidences of causing flight of adults that are shading young to prevent overheating during high temperatures may cause mortality of the young. Observation for Golden Eagles during inclement weather is impractical, uncomfortable, and unsafe for Golden Eagles and observers. Weather will be recorded by the observer.

Time of day: Aerial surveys should be conducted, at the beginning of the day if winds permit. Likewise, ground surveys should be initiated, where possible, in morning hours when the air is still to avoid heat waves. Prime observation periods are around dawn, or shortly thereafter. In some cases the angle of the sun in relation to the cliff can be a more important issue, and some cliffs are better observed in afternoon light, however observations of adult behavior that are used to determine nesting chronologies may be conducted during most of the day. Observers should be aware of the angle of the sun in relation to the observation post and the nest. Some sites are plagued by afternoon winds, heat waves, or dust storms; local observation conditions should be taken into account prior to establishing viewing periods. Time of day will be recorded by the observer.

Time of year: Breeding surveys for Golden Eagles are latitude and elevation dependent; however, their nesting season ranges in the contiguous United States from 01 January to 31 August (Kochert et al. 2002). Nesting failures and seasonal variations should be considered as potential anomalies to 'normal' behavior and nesting chronologies. Dates to be used as a cut-off period for observation and reporting of nesting failures or non-nesting status will vary per region. The dates listed below are to be used as general guides, and should not be used as final nest site failure survey determination dates. Location-specific determination dates should be developed in coordination with the Service, State, or Tribal wildlife agencies, and raptor experts.

Duration of stay at observation points: Ground observers will survey from observation points for a minimum of 4 hours, unless observations yield Golden Eagle presence, or Golden Eagle behavior indicate eggs or young, or observation suggests the observer is disturbing the birds. Slowly walking and observing all potential nesting substrate can be used to completely inventory potential habitat. Observation periods may last longer as longer observation periods may be necessary to accurately determine nesting chronologies. Duration of stay at known or suspected territories during helicopter reconnaissance, or during ground observation periods will be recorded by the observer.

VII.b Aerial surveys

Helicopters are an accepted and efficient means to monitor large areas of habitat to inventory potential habitat and monitor known territories only if accomplished by competent and experienced observers. They can be the primary survey method, or can be combined with follow-up ground monitoring. Disturbance to eagles is minimal only WHEN accepted aerial practices and techniques are followed. NOTE: Ground surveys can be used when their use is more efficient, or when other circumstances (i.e. bighorn sheep lambing areas) require this method.

Coordination between state and federal agencies is an important aspect of aerial surveys to develop acceptable search criteria to be used for identifying likely suitable nesting habitat and locating nests, as well as to be become acquainted with potential hazards and air space restrictions. Survey pilots should be aware of potential ground hazards within the habitat to be examined, including marked and unmarked transmission and wires. Other hazards to surveyors include rock-fall or tree fall from above the helicopter, raptors or other birds colliding with the helicopter, and collision with other aircraft. Although pilots are often the first to note a flying raptor during surveys, some accidents involving wildlife researchers have been attributed to the pilots focusing on the survey, rather than giving their complete attention to flying the helicopter.

Helicopters used for surveying Golden Eagle habitat should be light utility, i.e. small to medium sized (e.g. MD-500/520, Eurocopter 145, Bell Jet-Ranger 206, UH-72,) capable of vertical mobility in warm temperatures and higher elevations. Inventories for raptors can be conducted with the main observer door(s) removed (which may provide more lateral and horizontal

visibility), or with the doors closed. The decision regarding observer doors should remain a personal choice, with the safety of pilots and observers as the primary determinant.

Cliffs should be approached from the front, rather than flying over from behind, or suddenly appearing quickly around corners or buttresses. Inventories should be flown at slow speeds, ca. 30 – 40 knots. However, detection of nests may require slower speeds, e.g. 20 knots, while between nest speeds can be higher (+ 60 knots). All potentially suitable nesting habitats (as identified in coordination with the Service) should be surveyed; multiple passes at several elevation bands may be necessary to provide complete coverage when surveying potential nesting habitat on large cliff complexes, escarpments, or headwalls. Hovering for up to 30 seconds no closer than a horizontal distance of 20 meters from the cliff wall or observed nests may be necessary to discern nest type, document the site with a digital photograph of the nest, and if possible, allow for the observer to read patagial tags, count young, and age young in the nest (Hoechlin 1976). Confirmation of nest occupancy may be confirmed during later flights at a greater horizontal distance.

Re-nesting is rare, but Golden Eagles may fail at their first nest attempt, and move to, or create, an alternate nest site. Multiple visits to known or potential nesting habitat may be necessary to provide complete observation and coverage of habitat.

To inventory for the purpose of documenting presence/absence of Golden Eagles in potential habitat, at least 2 aerial observation flights of habitat are necessary. These flights will be spaced no closer than 30 days apart. Additional inventory work in the territory is not necessary after nests have been located where Golden Eagles are found incubating, or where eggs or young and number of eggs or young are noted. At this point, the observation effort should switch to monitoring of the known territory. The nest location should be documented (see territory/nest naming convention, pp. 21).

Inventory and monitoring flights will be based on local knowledge of known nesting chronologies for that latitude and elevation, and should be timed to be the most efficient to reduce the number of visits to the nest site. Flights may occur preferentially during a) late courtship, b) egg-laying though hatch, and/or c) when the young are between 20 – 51+ days old. Productivity surveys are best scheduled when the young are approximately 51+ days old (prior to fledging). Aerial visits at known nests may be augmented or replaced by ground observation (see below).

Other raptors or special status species may be observed during the flight, and should be recorded/reported. Coordination with state and federal agencies will be necessary when state or federally listed Threatened, Endangered or special status (species of concern, sensitive, etc.) species are present in the flight survey area (i.e. big-horn sheep, peregrine falcons, etc.).

Bighorn sheep share the same type of cliff complexes Golden Eagles use for nesting, and are hyper-sensitive to helicopters (Weyhausen 1980, Bleich et al. 1990). Specifically for bighorn sheep lambing areas, helicopter reconnaissance and surveys for Golden Eagles are not possible as these flights will induce unpermitted take during the lambing season; all helicopter survey work for Golden Eagles should be avoided in known lambing areas. Ground observation will be necessary for inventory of cliff complexes and monitoring of potential and known Golden Eagle territories in bighorn sheep lambing areas.

Most Golden Eagle respond to fixed wing aircraft and helicopters by remaining on their nests, and continuing incubation or roosting (DuBois 1984, McIntyre 1995). Perched birds may flush. During aerial surveys, deference to flying eagles should be given at all times. Flights at nest sites should be terminated and the helicopter should bank away and move to the next location if Golden Eagles appear to be disturbed; i.e. behavior that indicates the birds are agitated by the presence of the helicopter. In short, observers should obtain their data, and leave as soon as possible.

Any disturbance behavior observed should be noted so that consecutive aerial surveys would be sensitive to Golden Eagles at that location. Aerial reconnaissance to inventory/survey for potential habitat and additional visits at known nests may be augmented/replaced by ground observation from a safe distance (see below). Ground observation may be the recommended alternative to additional survey flights due to convenience or necessitated by other sensitive wildlife species. Follow-up ground observation from a safe distance may also be the recommended alternative for additional nest site monitoring.

Observers in helicopters have specific duties. At least two observers may be best for aerial surveys; one the lead observer, the other(s) supplement survey effort. One observer is assigned to record data on a tape recorder (unless the verbal interchange can be recorded on the helicopters internal communication system), and the other briefly records data on hard-copy and with digital photographs. Aerial observation routes should be recorded, downloaded, and reported using Global Positioning System track routes or applicable software programs. Observation locations and time-on-site should be recorded on applicable maps to ascertain coverage of cliff systems and other potentially suitable habitat.

Summary:

- Qualified observer(s) (as defined in section VIII).
  No closer than 10-20 meters from cliff; no farther than 200 meters from cliff (safety dependent).
- Close approach and extended hovering is allowed when there are no birds on the nest to allow observers to count eggs, dead young, or confirm nest failure.
- Multiple passes or 'bands' (i.e. back and forth at different elevations above ground level) of observation across cliff habitat may be necessary to achieve complete coverage in large cliff complex'.
- Occupied territories and current and alternative nest sites will be documented; nests 'decorated' with fresh branches should also be delineated.
- Once a nest with eggs, young, or an incubating adult has been located, there is no need to search for other nests within the territory.
- Minimal hovering time at known or potential nest; ca < 30 seconds.
- At least 2 surveys of previously unsurveyed habitat will be spaced at least 30 days apart.

VII.c. Ground Surveys

Ground surveys of potential habitat

Ground surveys for Golden Eagles in potential habitat may be achieved without aerial support, or may be used to augment extant aerial surveys. Ground surveys to detect Golden Eagle nests and the selected nest at known territories are effective in habitat where observation points are established to observe areas on cliffs, utility towers, or in trees suspected to be nesting habitat. As with aerial surveys, identification criteria for nesting habitat should take place in coordination with the Service, State or Tribal wildlife agencies, and raptor specialists.

Observation posts (OP) are established during initial reconnaissance of potential or known nest cliffs, and are established in locations that are far enough from the potential nest site to effectively observe the behavior of the adults (if present) without disturbing nesting behavior. Well-placed OPs provide unobstructed viewing of the potential nest location or of the area to be surveyed; including a broad panorama of the surrounding habitat. Multiple OPs or walking surveys may be necessary to observe potential nest sites. OPs located in front of, and below the potential nest cliff or tree are best. Placing OPs below the potential nest cliff reduces stress if an incubating adult may be present. The distance from an OP to the potential nest site may range from 300 – 1600 meters (latter represents extreme circumstances) from the cliff base to the observer, and generally no greater than 700 meters.

Golden Eagles may use alternative nests. Detection of previously unknown alternate nests and observation of all known alternative nests will become important if Golden Eagles fail in their initial nesting attempt, or are not observed at the probable nest location.

~~Ground monitoring: known territories~~

Monitoring to document nesting success at known territories may occur solely via ground observations. Observation of known territories should use the methodology described for ground monitoring of potential habitat (see section VIIc). Dates of all visits to the nesting territory will be recorded; date of confirmation of nesting failure will be key data for site specific and regional analysis.

Nesting outcomes

Fledging success will be determined via the observation of young that are at least 51 days of age, or are known to have fledged from the observed nest. If there is whitewash (Golden Eagle defecation) and a well worn nest, young were previously observed in the nest to be > 4 weeks old during a previous visit, and the young would have been > 51 days old at the time of the visit, and no dead young are found after a thorough ground search, the nesting attempt can be deemed successful.

Nesting failure occurs when a nest where eggs were laid or where incubation behavior was observed fails to have any young reach 51 days of age. If necessary, nesting failure will be confirmed by using a spotting scope to view the nest to determine if dead young are observed. Nesting failures may also be determined if observations of the nest prior to the projected fledge date yields no young or fledglings where eggs or young were previously observed. In these instances observation periods should last 4 hours (consecutively), or are confirmed by aerial survey. If dead young are observed in the nest (i.e. all young are dead), monitoring efforts may cease. Nest failures may also be confirmed by an approach (walk-in) to the nest no more than 4 weeks after fledging was scheduled to occur. Observers will look for dead chicks at the base of the nest cliff or tree, where access is reasonable and safe.

Observers must document the criteria they use to conclude that success or failure occurred.

Summary

- Observation posts for monitoring known territories will be no closer than 300 meters for extended observations, and generally no further than 700 meters, where terrain allows. Maximum OP distance would be 1600 meters.

- To inventory and determine occupancy of cliff systems, there will be *at least* 2 observation periods per season. To determine fledging success, additional observations may (or may not) be necessary.
    - Observation periods will last at least 4 hours for known nest sites, or until territory occupancy can be confirmed.
    - Observation periods will last for at least 4 hours per 1.6 km of cliff system, based from the center point of that cliff complex.
    - Observation periods will be at least 30 days apart for monitoring efforts.
- To collect monitoring data at a known nest territory, there will be at least 2 observation periods per season.
    - Observation periods from ground observation points will last at least 4 hours for known nest sites or until nesting chronology can be confirmed per visit. Observation periods will be at least 30 days apart.

VIII. Observer qualifications

Surveyor experience affects the results of protocol-driven raptor surveys. All surveyors/observers should have the equivalent of 2 seasons of intensive experience conducting survey and monitoring of Golden Eagle and/or cliff dwelling raptors. That experience may include banding, intensive behavioral monitoring, or protocol-driven survey work. Experience should be detailed and confirmed with references, and provided to action and regulatory agencies. All surveyors should be well-versed with raptor research study design and Golden Eagle behavior and sign, including nests, perches, mutes, feathers, prey remains, flight patterns, disturbance behavior, vocalizations, age determination, etc. **Aerial surveys will be conducted by raptor specialists who have at least 3 field seasons experience in helicopter-borne raptor surveys around cliff ecosystems.**

In lieu of limited or no Golden Eagle experience, ground surveyors should attend at least a 2-day Golden Eagle training session convened with classroom and field components; trainers will be designated by the USFWS/USGS. Inexperienced or limited experience surveyors will be mentored by Golden Eagle specialists for at least 1-2 field seasons, depending on their experience level, and should assist with the preparation of at least 3 surveys and reports over at least 3 years. A Golden Eagle specialist is defined as a biologist or ecologist with 5 or more years of Golden Eagle or cliff dwelling raptor research/survey experience, possession of state/federal permit allowing capture, handling, and/or translocation of Golden Eagles and/or

cliff dwelling raptors; and/or relevant research on raptors published in the peer reviewed literature.

IX. Documentation and accepted notation of territory/nest site and area surveyed

Data for each territory/nest site(s) and area visited will be reported annually to the applicable regional office of the USFWS Division of Migratory Bird Management for collation into a national database.

Minimum data collected at known Golden Eagle territories

Observation of potential sites and known nest territories will produce data helpful to determine territory occupancy, productivity, and fate of the nesting attempt. Each observation and all site specific data collected should include at least;

a) date of observation,
b) time of observation(s),
c) weather during observation,
d) duration of observation,
e) name of observer(s),
f) location of observation,
g) description of observation.

Data collected during inventory and monitoring will include (at least) the following:

- Territory status [Unknown; Vacant; Occupied-1 eagle; Occupied-2 eagles- laying or non-laying; Breeding successful (chick observed to be at least +51 days-fledging), Breeding unsuccessful (failed-nesting attempt failed after eggs were laid)].
- Nest location (decimal degree lat/long or UTM).
- Nest elevation.
- Age class of Golden Eagles observed.
- Document nesting chronology;
    - Date clutch complete (estimated). Describe incubation behavior observed to derive this date, and/or use backdating from known nestling age).
    - Hatch date (estimated from age of nestlings).
    - Fledge date (known or estimated; see nesting outcomes, pp. 18).
    - Date nesting failure first observed and/or confirmed.

- Number of young at each visit and at >51 days of age.
- Digital photographs; a) landscape view of area inventoried, b) landscape view of territory, and c) nest(s).
- Substrate upon which the nest is placed (tree species, cliff, or structure).

Additional data that can be collected include (but are not limited to):

- Presence or absence of bands (USGS and VID), patagial tags (number and color), or telemetry unit.
- Forage location (if known).
- Prey items noted (if discerned).
- Height of nest on cliff or in tree, and description of technique used to estimate height.
- Species of tree, type of rock, or type of structure used to support the nest.
- Overall cliff or tree height, and description of technique used to estimate height.
- Nest aspect.
- Other nesting raptors present nearby.

Each area surveyed under the requirements of this protocol, including surveyed habitat, occupied nesting territory, historical territory, and suspected/alternative nests will be recorded in a standardized manner to allow local, regional, and national data analysis.

Recommended Golden Eagle Territory/site naming convention:

XX^1-XXX^2-XXXXX/XX^3-XXX^4-XX^5 Territory name

XX^1 = State (two letter alpha)

XXX^2 = County (three letter alpha)

XX^3 = USGS Quad [five numeric/two letter alpha] (when the territory straddles adjacent quad maps, the quad in which the first nest was found will be used to describe the territory; XX^5 is used to document the locations of alternate nests within a territory).

XXX[4]=Assigned Territory number within USGS quad (three numeric)

XX[5]=Assigned Nest number within territory in instances of alternate nests (two numeric)

Site name=traditional site name, or if new, use local naming convention (e.g. Upper fork Amundsen Creek, Fort Peck flatland, Farmer Jane's back 40).

Example CA-KER-38512/DG-03-02 Abbot Creek

X. Additional considerations

This interim document primarily contains methods for inventorying and monitoring at nest sites, but the prohibitions against take and the new regulations apply at nest sites and foraging areas, as well as during migration and other non-breeding times. The Service will develop or adopt recommendations for surveys applicable to non-nesting in other documents.

Suitable foraging habitat

Golden Eagles forage close to and far from their nests, i.e. < 6 km from the center of their territories, but have been observed to move 9 km from the center of their territories in favorable habitat (McGrady et al. 2002). These distances may be further in xeric habitat.

Suitable wintering habitat

During winter, Golden Eagles are found throughout the contiguous United States. Inventories for wintering Golden Eagles will encompass all habitat where Golden Eagles have been known to nest, roost, and forage. Refer to Wheeler (2003, 2007) for maps elucidating suitable wintering range.

Winter surveys

Survey information gathered during the non-breeding period is needed to identify foraging areas and determine numerical estimates of use by Golden Eagles. Presence of Golden Eagles during winter surveys does not necessarily mean that breeding individuals are present; however follow-up surveys during the breeding season are necessary to denote occupancy at suspected or known territories.

Migration surveys

The location of migration routes or areas in relation to a proposal that are likely to take Golden Eagles through injury or mortality may have critical implications. Therefore, evaluations should assess whether migratory or transient Golden Eagles are likely to be present during the construction and the life of the project. Other factors to consider include numbers of Golden Eagles moving through the project area, movement patterns (including a three-dimensional spatial analysis), time of day, and seasonal patterns. In the case of wind development, surveys will need to identify the locations of migration routes and movements during migration in relation to proposed turbines and rotor-swept area.

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XIII Glossary

Action agency – an agency or entity authorizing an action or plan, or providing funding for actions and plans.

Active nest (from the regulations) — a Golden Eagle nest characterized by the presence of any adult, egg, or dependent young at the nest in the past 10 consecutive days immediately prior to, and including, at present. Applies only to applications for permits to take eagle nests.

Breeding home ranges - the spatial extent or outside boundary of the movement of individuals from Golden Eagle pairs during the course of everyday activities during the breeding season.

Inactive nest (from the regulations) — a Golden Eagle nest that is not currently being used by eagles as determined by the continuing absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days immediately prior to, and including, at present. An inactive nest may become active again and remains protected under the Eagle Act.

Inventory –systematic observations of the numbers, locations, and distribution of Golden Eagles and eagle resources such as suitable habitat and prey in an area.

Local area population — the population within the average natal dispersal distance of the nest or nests under consideration (43 miles for bald eagles, 140 miles for golden eagles). Effects to the local area population are one consideration in the evaluation of the direct, indirect, and cumulative effects of take, and the mitigation for such take, under eagle take permits.

Migration corridors - the routes or areas where eagles may concentrate during migration. Golden Eagles begin migrating across a broad front, but tend to concentrate along leading lines (geographical features such mountain ridges) as they move between geographic locations. Golden Eagles are observed in largest numbers along north-south oriented mountain ranges where they soar on mountain updrafts. The species typically avoids lengthy water-crossings. In North America, migrating Golden Eagles concentrate along the Appalachian Mountains in the East and Rocky Mountains in the West.

Management agency - see Action Agency.

Monitoring - inventories over intervals of time (repeated observations), using comparable methods so that changes can be identified. Monitoring includes analysis of inventory data or measurements to evaluate change within or to defined metrics. Monitoring also includes repeated observations of a known nesting territory.

Occupied Nests - those nests which are used for breeding in the current year by a pair. Presence of raptors (adults, eggs, or young), freshly molted feathers or plucked down, or

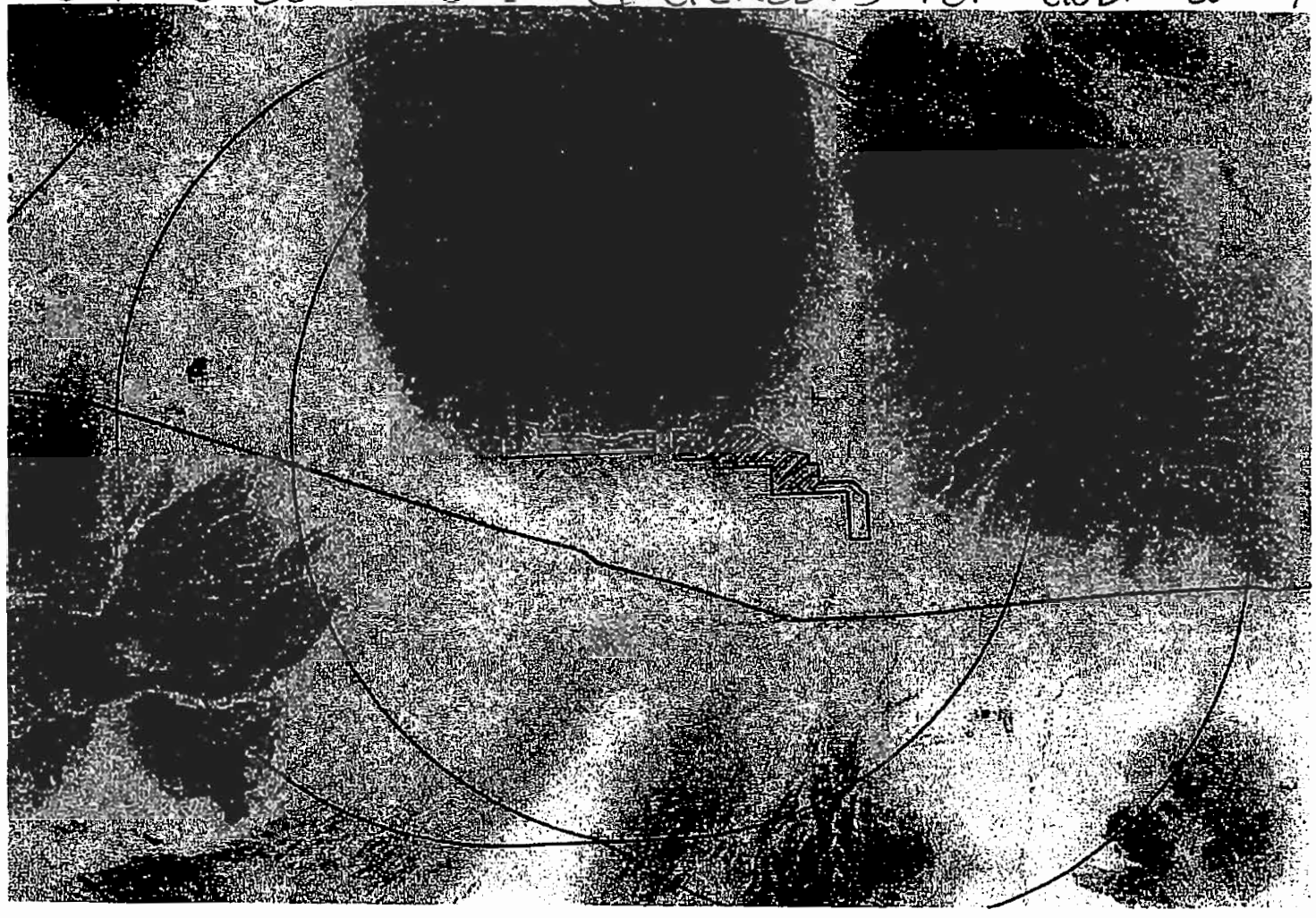
current years' mute remains (whitewash) suggest site occupancy. Additionally, for the purposes of these guidelines, all breeding sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing an affinity to a given area. If this culminates in an individual nest being selected for use by a breeding pair, then the other nests in the nesting territory will no longer be considered occupied for the current breeding season. A nest site remains occupied throughout the periods of initial courtship and pair-bonding, egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

Unoccupied Nests - those nests not selected by raptors for use in the current nesting season. Nests would also be considered unoccupied for the non-breeding period of the year. The exact point in time when a nest becomes unoccupied should be determined by a qualified wildlife biologist based upon observations and that the breeding season has advanced such that nesting is not expected. Inactivity at a nest site or territory does not necessarily indicate permanent abandonment.

Productivity — the mean number of individuals fledged per occupied nest annually.

Survey – is used when referring to inventory and monitoring combined.

10 mile buffer around GENESIS For GOEA surveys.



ATTACHMENT B
HAGEMANN COMMENTS

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July 8, 2010

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Subject: Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

I have been working for the California Unions for Reliable Energy ("CURE") as a consultant on the Application for Certification ("AFC") for the Genesis Solar Energy Project ("Project" or "GSEP") since the data adequacy phase. I have reviewed numerous documents and have conducted my own investigations and analyses regarding the Project's potential environmental and health and safety impacts.

My testimony is based on the activities described above and the knowledge and experience I have acquired during more than 25 years of working on environmental issues. A summary of my education and experience is attached to this testimony as Attachment 1.

I. Failure to Estimate Annual and Worst Case Spill Volume

The Project proposes to use parabolic mirror solar trough technology. The Revised Staff Assessment ("Revised SA") states that GSEP would circulate 2,000,000 gallons of Therminol VP-1 heat transfer fluid (HTF) through a piping system to generate high pressure steam.[1] This is

[1] Revised SA, p. C.4-8.

the same technology and the same HTF used at the Luz Solar Energy Generating Stations (SEGS) III through IX facilities Kramer Junction, California.[2]

Past HTF spills at the SEGS facilities have generated significant quantities of contaminated soil and the generation of liquid waste. For example, a July 27, 2007 HTF spill of 30,000 gallons (more than the capacity of a backyard swimming pool) resulted in the offsite transport of 6,408 cubic yards of impacted soil for disposal (Attachment 2). Numerous other large spills have occurred at the SEGS facilities.

The Revised SA states:

> The Project will include a bioremediation LTU to treat soil impacted by incidental spills and leaks of HTF at various concentrations. The unit will be designed and permitted as a Class II LTU in accordance with CRRWQCB and CIWMB requirements.
>
> Based on available operation data from other sites, it is anticipated approximately 750 cubic yards (on average) of HTF-affected soil may be treated per year. Larger or smaller quantities could be generated during some years, depending on the frequency and size of leaks and spills.[3]

The Revised SA provides no analysis to support the estimate that 750 cubic yards of HTF-contaminated soil would need to be treated per year in the LTU. Additionally, no attempt is made in the Revised SA or supporting documentation to quantify a worst-case spill and to identify measures that would be taken to respond to such a spill, including testing, transport, and disposal of the contaminated soil and of the spilled HTF in excess of the capacity of the LTU.

Failure to substantiate the annual estimate of HTF-contaminated soil and to identify a worst-case scenario is a significant shortcoming of the Revised SA. Large spills, on the order of tens of thousands of gallons as documented at SEGS, may also occur at GSEP and would overwhelm the 750 cubic yard per year capacity of the facility that is proposed in the Revised SA to treat contaminated soil. For example, two past spills at SEGS would greatly overwhelm the 750 cubic yard treatment facility proposed for GSEP: a May 1999 spill of 21,000 gallons which generated 2,000 cubic yards of HTF-contaminated soil and the July 2007 spill of 30,000 gallons which generated more than 6,500 cubic yards of HTF-contaminated soil (Attachment 2).

Spills of HTF are likely to generate significant amounts of hazardous waste at GSEP, well in excess of the capacity of the LTU, as evidenced by records of spills at the analogous SEGS facilities. The Revised SA makes no provisions for treatment or offsite disposal of contaminated soils that would exceed the LTU capacity. The Revised SA states only that 10 cubic yards of contaminated soil per year would require offsite disposal as hazardous waste.[4]

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[2] http://en.wikipedia.org/wiki/Solar_Energy_Generating_Systems
[3] Revised SA, p. B.1-12.
[4] Revised SA, p. C.13-14.

The Revised SA must substantiate the annual estimates of HTF-contaminated soil and identify worst case scenarios that would estimate maximum spill volumes of HTF and the amount of contaminated soil that would be generated by such spills.

II. Conditions of Certification are Inadequate to Mitigate Spills of Heat Transfer Fluid

Conditions of Certification in the Revised SA fail to ensure that impacts from HTF-spills will be reduced to less than significant. WASTE-11, the only condition of certification that addresses HTF spills, requires the following:

> The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.[5]

Waste-11 provides for no specific provisions to properly manage and dispose of hazardous substances, materials or wastes and fails to consider worst case spill scenarios that may involve thousands of gallons of HTF.

Further, the Revised SA defers the establishment of a concentration for HTF-contaminated soils that would define whether the waste is hazardous or non-hazardous. The Revised SA states:

> Soil contaminated with HTF measured at concentrations >10,000 mg/Kg is anticipated to approved as Non-RCRA hazardous waste.[6]

Condition of Certification Waste-11 must establish specific measures to respond to spills of HTF and establish a concentration of HTF in soil that would be considered to be a hazardous waste. Without a hazardous waste criterion for HTF in soils, impacts cannot be adequately predicted, and response plans cannot be formulated to address spills.

III. Plans for Field Response to HTF Spills are Inadequate

Inadequate provisions are made in the Revised SA and supporting documents to respond to spills of HTF in the field. The ROWD states:

> Spills of HTF will be cleaned up within 48 hours and affected soil will be moved to a staging area in the LTU where it will be placed on plastic sheeting pending receipt of analytical results and characterization of the waste material.[7]

At ambient temperatures, the HTF is of a liquid consistency at temperatures above 54 degrees Fahrenheit.[8] At the SEGS facilities, when spilled, the HTF forms wax-like piles of free standing

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[5] Revised SA, p. C.13-31.
[6] Revised SA, p. C.13-16.
[7] ROWD, p. 21.
[8] Revised SA, p. C.4-8.

liquids on the ground surface (Attachment 2). The piles are scooped up or are vacuumed in cleanup efforts documented at the SEGS facilities. The Revised SA makes no provisions for the management of the free standing liquids following a spill.

Additionally, the Revised SA makes no provisions for sampling HTF-contaminated soil at the point of the spill origin. The ROWD states only that spills will be "cleaned up within 48 hours and affected soil will be moved to a staging area in the LTU where it will be placed on plastic sheeting pending receipt of analytical results and characterization of the waste material".[9] Movement of contaminated soil without testing prior to placement in the LTU may result in placing hazardous waste in the land treatment unit, which is prohibited by state law, as discussed further in section VII below.

A corrective action plan for cleanup of spills of HTF-contaminated soils must be included as a requirement for certification. The corrective action plan should identify a numeric cleanup standard for HTF-contaminated soils to ensure the adequacy of cleanup in protecting human health and the environment at the point of spill origin.
The corrective action plan should include sampling procedures, cleanup goals, and methods for long term monitoring.

IV. The Presence of Benzene as an HTF Degradation Product in Vapor and Soil May Put Workers at Risk and Has Not Been Analyzed or Mitigated

Benzene is identified as a degradation product of Therminol VP-1 in the Revised SA[10] and at other solar thermal projects that utilize Therminol VP-1 as a heat transfer fluid.[11] For the purposes of modeling air emissions, the Revised SA states that thermal decomposition of Therminol VP-1 in fugitive emissions results in the formation of benzene and phenol at 89.9 percent and 9.8 percent, respectively.[12]

Therefore, when HTF is spilled on soil, workers who respond may be exposed to benzene in vapors that originate from the contaminated soil as the HTF degrades. Additionally, workers may be exposed to benzene through dermal contact with the HTF.

Benzene is a known human carcinogen.[13] Without proper precautions and protective equipment, including respirators and appropriate gloves and clothing, workers who respond to the spills may be exposed to benzene while breathing the vapor or when touching contaminated soil. Additionally, workers who tend to the HTF-impacted soil in the LTU may be at risk from inhalation of vapors and from dermal contact without precautions.

The Conditions of Certification Worker Safety-1 through Worker Safety-9 do not provide for adequate safeguards to protect workers who respond to spills and workers who tend to

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[9] ROWD, p. 21.
[10] Revised SA, p. C.5-13.
[11] http://www.energy.ca.gov/sitingcases/solar_millennium_palen/documents/applicant/data_responses_set_1/Public%20Health/DR%20172-179%20Palen%20Public%20Health.pdf
[12] Revised SA, p. C.5-16.
[13] http://www.atsdr.cdc.gov/tfacts3.html

contaminated soils at the LTU. Worker Safety-2 does require a personal protective equipment program to be submitted to the CPM for review and comment; however, no provisions are made in the Revised SA to ensure specific protective measures for response personnel and LTU workers to prevent exposure to benzene, a known human carcinogen.

V. Analytical Methodology for Testing HTF-Contaminated Soil is Inappropriate

The Revised SA identifies EPA Method 8015 as the test method to be used for analyzing HTF-contaminated soil.[14] However, in the review of the proposed Abengoa solar thermal facility, the Lahontan RWQCB staff determined that EPA Method 8015 was not appropriate as the sole analytical method for Therminol VP-1.[15] For soil testing at the LTU at Abengoa, the Lahonton RWQCB required analysis using EPA Method 1625B for HTF and Method 8260 for volatile degradation products of HTF such as benzene and toluene. Testing for known degradation products of HTF, including benzene, using EPA Method 1625B or other appropriate analytical methodology must be incorporated into the Revised SA as a condition of certification.

Additionally, soil should be tested for benzene as a condition of the baseline characterization and annual monitoring at the LTU. The ROWD states that prior to the discharge of any HTF impacted soil into the LTU, soil samples will be taken to establish background concentration in the soil. Subsequently, soil samples will be collected on an annual basis at a depth of one foot below the compacted soil base at the LTU. The background and annual soil samples are to be analyzed using modified EPA Method 8015 to verify that HTF is not migrating below the 5-foot treatment zone underlying the unit. If HTF concentrations above the laboratory detection limit are found below the 5-foot treatment zone, the facility will implement a corrective action plan and notify the CRBRWQCB to report evidence of a release.[16]

It is essential to monitor for benzene, a known degradation product of the Therminol VP-1 HTF to be used at the site. The main ingredients of Therminol VP-1, biphenyl and diphenyl oxide, are not considered to move readily through soil whereas benzene is known to move rapidly through soil. Therefore, monitoring for the presence of benzene with EPA Method 8260 is critical to determine if a release has occurred from the LTU.

VI. The Presence of Benzene in Groundwater as a Degradation Product of HTF Must be Considered in Monitoring Well Design and LTU Design to Prevent Degradation of Water Resources

A groundwater monitoring network, consisting of three monitoring wells, is to be established to monitor groundwater for potential releases from the six proposed evaporation ponds and the LTU.[17] Groundwater samples are to be analyzed for biphenyl and diphenyl oxide, major components of Therminol VP-1, using EPA Method 8015; however, benzene is not included in

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[14] Revised SA, p. C.13-30.
[15] http://www.energy.ca.gov/sitingcases/abengoa/documents/others/2010-02-25_HTF_Conditions_From_James_Brathovde_TN-55665.pdf
[16] ROWD, p. 8.
[17] ROWD, p. 5.

the list of compounds to be analyzed in the groundwater monitoring program.[18] The Revised SA must include benzene as a groundwater monitoring constituent using an appropriate analytical methodology.

Unlike other components of HTF, benzene is highly mobile in soil and does not typically adsorb to soil.[19] Therefore, releases of benzene would potentially move to groundwater.

The water table is found at 70 to 90 feet below ground.[20] Groundwater provides the only available water resource in Chuckwalla Valley. Designated and potential beneficial uses of groundwater in the basin include domestic, municipal, agricultural and industrial use.[21] The Revised SA must address benzene as a groundwater contaminant that could impact the designated beneficial uses of groundwater.

VII. Plans for Staging HTF Spills may Violate the California Health and Safety Code

The LTU will be used for the staging of soil that is contaminated by HTF spills. The Revised SA states:

> The LTU will not incorporate a liner containment system or LCRS, but will be constructed with a prepared base consisting of 2 feet of compacted, low permeability, lime-treated material. This base will serve as a competent platform for land farming activities, and will serve to slow the rate of surface water infiltration in the treatment area.
>
> A staging area is allocated in the LTU for storage of HTF-impacted soils while they are being characterized. Soil characterized as hazardous will be removed from the site; therefore, no additional liner system is required in the LTU to cater for the hazardous waste.[22]

The Revised SA states that HTF-contaminated soil will be placed on plastic sheeting pending receipt of analytical results and characterization of the waste material.[23]

A flow diagram, as follows, is provided in the ROWD as Figure 10:

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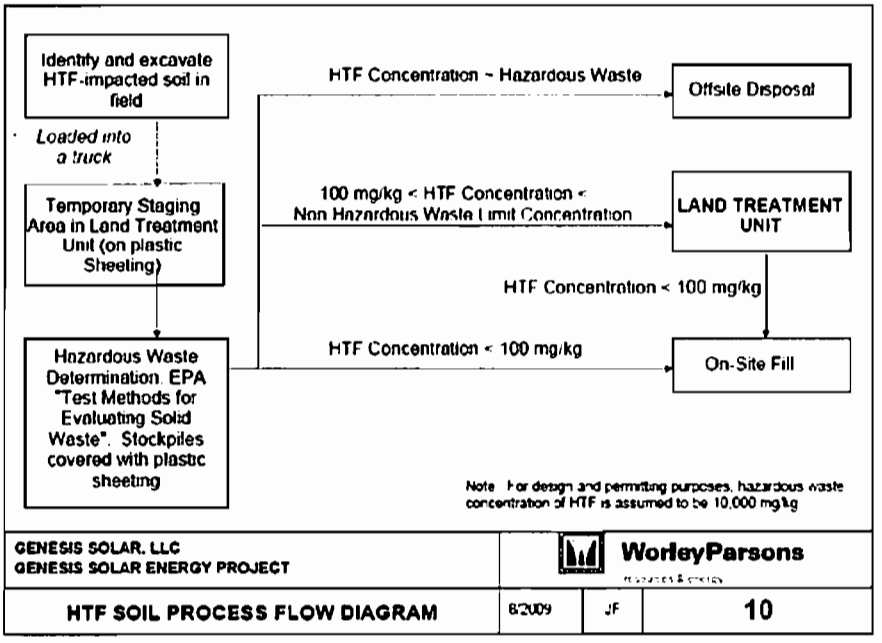
[18] ROWD, Table 1.
[19] See for example http://www.cluin.org/download/toolkit/petrefsn.pdf, p. 61
[20] Revised SA, p. C.9-52.
[21] Revised SA, p. C.9-22.
[22] Revised SA, Soil and Water Resources, Appendix B, Facts for Waste Discharge,
[23] Soil and Water Resources, Appendix B, Facts for Waste Discharge, p. 16.



The flow diagram shows that HTF-impacted soil will be placed in the staging area of the LTU without sampling. HTF-impacted soils will be identified (presumably by visual means) and then moved to the LTU prior to sampling.

Section 25203 of the California Health and Safety Code prohibits the disposal of hazardous waste except at a hazardous waste facility. "Disposal" means either of the following:

> (1) The discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste so that the waste or any constituent of the waste is or may be emitted into the air or discharged into or on any land or waters, including groundwaters, or may otherwise enter the environment.
> (2) The abandonment of any waste.[24]

If a leak occurs, section 25123.3 of the California Health and Safety Code sets forth the requirements for temporarily staging waste. Temporary waste staging is appropriate for hazardous waste only if, among other criteria:

- the hazardous waste being accumulated does not contain free liquids;
- the hazardous waste is accumulated on an impermeable surface, such as high density polyethylene (HDPE) of at least 20 mills that is supported by a foundation, or high density polyethylene of at least 60 mills that is not supported by a foundation, among other requirements.

If any of the requirements are not met, then the Project must be regulated as a hazardous waste storage facility under Health and Safety Code Section 25200 et seq.

[24] Health and Safety Code §25113(a).

The staging area of the Project's LTU does not meet the requirements for a temporary staging area under Section 25123.3(a)(2) of the Health and Safety Code for two reasons. First, the hazardous waste being accumulated would likely contain free liquids. Spills of HTF will generate free liquids at temperatures above approximately 54 degrees Fahrenheit. The ROWD and the Revised SA make no mention of liquid wastes that will be generated when HTF is spilled. Second, contaminated soil would not be "accumulated on an impermeable surface, such as high density polyethylene (HDPE) of at least 20 mills that is supported by a foundation, or high density polyethylene of at least 60 mills that is not supported by a foundation." The Revised SA states only that HTF-contaminated soil will be "placed on plastic sheeting" pending receipt of analytical results and characterization of the waste material.

The Revised SA must incorporate as conditions of certification all measures necessary for compliance with all cited sections of the California Health and Safety Code.

VIII. A UXO Survey is Necessary Prior to Certification

A Phase I Environmental Site Assessment was conducted in support of the AFC.[25] The Revised SA states that the Phase I found that the Project area:

> was within General Patton's World War II (WWII) Desert Training Center, California-Arizona Maneuver Area region (1942 to 1944). The region surrounding the Project Area was considered a suitable location for training troops that would be deployed in the North Africa Campaign. After 2 years in operation and the training of one million troops, the desert training camps were closed in 1944. Military trash scatter including ration containers, military-issue utensils, and one 50-caliber cartridge were identified during the Tetra Tech site visits.

The Revised SA concludes that there is potential for unexploded ordnance (UXO) at the Project site.[26]

The Phase I recommended a UXO survey, stating:

> Due to the use of the use of the Subject Property for military maneuvers, the potential exists for the presence of UXO. Prior to construction, it may be a prudent safety measure to conduct a stand-alone UXO screening of the Subject property.[27]

Condition of certification WASTE-5 requires the following:

> The project owner shall prepare a UXO Identification, Training and Reporting Plan to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance.[28]

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[25] Phase I Environmental Site Assessment, Genesis Solar Energy Project, Ford Dry Lake Site, August 2009
[26] Revised SA, p. C.13-11.
[27] Phase I ESA, p. 6.1.
[28] Revised SA, p. C.13-28.

Despite the Phase I recommendation, the Revised SA does not provide for a pre-construction UXO survey in WASTE-5 or in any other condition of certification. WASTE-5 provides for only a plan for a training program to identify UXO that relies upon construction personnel to identify UXO in the field during excavation and grading operations.

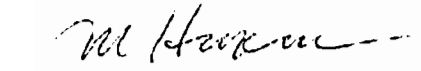
The need for a UXO survey prior to construction is heightened by the finding during the preparation of this testimony that the general vicinity of the Project area was in an area identified as a "gunnery range" on a map of the Desert Training Center/California Maneuver Area (see Attachment 3).

Additional research has shown that several exercises were held in Chuckwalla Valley, in an area that the Army believed to best represent terrain found in Libya. Small unit training was emphasized in the Chuckwalla Valley. A WWII-era map of the CAMA shows a feature, labeled No. 29, to be located approximately eight miles west of the Project (see Attachment 4). The feature is identified as the Headquarters of the Army Ground Forces, 1943.[29]

During field maneuvers, divisions defended positions opposing forces by placing numerous obstructions, including minefields.[30] Palen Pass, located approximately two miles north of the Project site, was the site of the largest maneuvers during the period the CAMA was in use.[31] Fortifications were constructed throughout the area of Palen Pass and bomb craters and cartridge cases can still be found in the area.[32]

Given the intensity of the military maneuvers in the general vicinity of GSEP, the Revised SA should include a condition of certification that would require a UXO survey in the Project area. The UXO survey should be conducted by trained and credentialed UXO professionals and consistent with BLM and Army Corps of Engineers Guidance in the Project area and the transmission line right of way prior to commencement of construction. Without such a condition, construction worker safety will be potentially jeopardized by the presence of UXO.

Sincerely,



Matt Hagemann, P.G.

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[29] The Desert Training Center/California Maneuver Area, 1942 – 1944, Volume 2, Historical and Archeological Contexts for the Arizona Desert. p.38, Prepared for the Bureau of Land Management under contract with the U.S. Army Corps of Engineers, Statistical Research Inc., September 2008 (available at http://www.sricrm.com/publications/tech.html)

[30] The Desert Training Center/California Maneuver Area, 1942 – 1944, Volume 1, Historical and Archeological Contexts for the Arizona Desert. p.102, Prepared for the Bureau of Land Management under contract with the U.S. Army Corps of Engineers, Statistical Research Inc., September 2008 (available at http://www.sricrm.com/publications/tech.html).

[31] *Id.*, p. 103.

[32] *Id.*, p. 103.

ATTACHMENT 1

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2503 Eastbluff Dr.
Suite 206
Newport Beach, California92660
Tel: (949) 887-9013
Fax: (949) 717-0069
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G.

Geologic and Hydrogeologic Characterization
Investigation and Remediation Strategies
Regulatory Compliance
CEQA Review
Expert Witness

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist, License Number 8571.

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 -- 2003);
- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);

- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a project to provide technical assistance to a comunity adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Lead analyst in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Lead analyst in the review of environmental issues in applications before the California Energy Commission.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of

wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the dischrge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.

- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

ATTACHMENT 2

kjc OPERATING COMPANY

41100 highway 395
boron, california 93516-2109

phone 760-762-5562
facsimile 760-762-5546
www.kjcsolar.com

June 4, 1999

Ms. Diane Ventura
Lahontan Regional Water Quality Control Board
15428 Civic Drive, Suite 100
Victorville, CA 92392

Re: Spill Report for 5/22/99 Incident

Dear Ms. Ventura:

Attached is a report of the spill, which occurred at SEGS III on May 22. If you have any questions, please contact me at your convenience.

Sincerely,

(FOR D.RIB)

David M. Rib
Manager of Regulatory Affairs

DR/pd
DR99-006

Attachment

cc: Joe Koutsky / LRWQCB
Steve Munro / CEC

SPILL REPORT

OWNER:	Kramer Junction Company
OPERATOR:	KJC Operating Company
PERMITS:	Board Order #6-97-58, WDID #6B364550002 (site and evaporation ponds) Board Order #6-95-102, WDID #6B368909005 (bioremediation)
DATE:	May 22, 1999
TIME:	11:30 a.m.
SITE ADDRESS:	41100 Highway 395
LOCATION:	SEGS III solar field, northwest quadrant
MATERIAL SPILLED:	Heat Transfer Fluid (HTF), Biphenyl-Diphenyl Oxide
APPROXIMATE VOLUME SPILLED:	Approximately 21,000 gallons where released, at least 10,000 spilled to soil
APPROXIMATE VOLUME OF CONTAMINATED SOIL:	Approximately 2000 cubic yards
CONTAMINATED SOIL DISPOSITION:	Soil was removed and staged in the on-site bioremediation facility. The volume of the contaminated soil is beyond the current permit capacity of the bioremediation facility, so the soil will be sent to the TPS Technologies thermal treatment facility in Adelanto.
LRWQCB CONTACT:	Diane Ventura at 12:55 on 5/24/99. Follow-up message left for Ms. Ventura on 6/1/99 at 12:50.

CIRCUMSTANCE OF SPILL:

The spill was caused by the failure of a "flexhose," which is the flexible connection between segments of the "Solar Collection Assemblies" (SCA) that allows each SCA to individually track the sun angle. This particular flexhose was at the end of a row where the local isolation valve is located, so it took longer to stop the leak by isolating a larger section of the solar field. There was a strong flow of HTF spilling onto the ground for about 15 minutes. There was a loss of approximately 21,000 gallons of HTF from the system, approximately 1,500 gallons of which was recovered from standing puddles. The HTF-contaminated soil in the area to a depth ranging from a few inches to several feet deep.

There is an ongoing program to replace the flexhoses with "balljoint" connections. This conversion is approximately 40% complete throughout the SEGS III-VII site. The flexhoses are periodically inspected, and most failures can be detected as they usually leak for several days before failing completely. Some failures can occur much more rapidly, as is thought to have happened in this case.

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SECOND SEMESTER AND ANNUAL 2007 BIOREMEDIATION MONITORING REPORT LUZ SOLAR PARTNERS III – VII LTD. SEGS III THROUGH VII FACILITIES BORON, CALIFORNIA

Submitted by:

FPL Energy Operating Services, Inc. for
Luz Solar Partners III – VII Ltd.
SEGS III – VII Facilities
41100 Highway 395
Boron, CA 93516

Gregg Sellers
Agent For
Luz Solar Partners III – VII Ltd.

amec

SECOND SEMESTER AND ANNUAL 2007 BIOREMEDIATION MONITORING REPORT LUZ SOLAR PARTNERS III – VII LTD. SEGS III THROUGH VII FACILITIES BORON, CALIFORNIA

10 January 2008

Prepared for:

Luz Solar Partners III – VII Ltd.
c/o FPL Energy Operating Services, Inc.
41100 Highway 395
Boron, CA 93516

Prepared by:

AMEC Earth & Environmental
221 – 18th Street SE
Calgary, Alberta
T2E 6J5

Project No. CE03501

Ian E. Hattie, M.Sc.
Associate

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Appendix A: Second Semester 2007 Routine Soil Sampling – Laboratory Data Sheets and Chain-of-Custody Records

1.0 INTRODUCTION

Luz Solar Partners III through VII Ltd. Solar Electric Generating Systems (SEGS) III through VII sites are located at 41100 Highway 395 in Boron, California (Kramer Junction). The SEGS III through VII sites are authorized to operate soil bioremediation cells and a landfarm the location of which are shown on Figure 1. The treatment facilities were designed and constructed in accordance with the requirements of Title 23, subchapter 15, of the California Code of Regulations. Under the terms of Revised Waste Discharge Requirements (WDRs) Board Order No. 6-95-102 issued by the California Regional Water Quality Control Board - Lahontan Region (RWQCB), the bioremediation treatment facility is referred to as the "Bioremediation Unit" and the landfarm is referred to as the "Landfarm". The combined facilities are simply referred to as the "Facility". The bioremediation facility receives soils impacted with heat transfer fluid (HTF) for treatment whereas the landfarm contains a combination of partially and fully-remediated soils or soils staged for treatment in the bioremediation cells as shown on Figure 2.

Soil treatment within the bioremediation facility involves manipulation of environmental controls such as moisture content, soil nutrients (nitrate fertilizer), and aeration of the soils through weekly to bi-weekly tilling to achieve the desired conditions for enhancing biodegradation of the constituents of concern. Soils treated to below 1,000 parts per million (ppm) HTF may be transferred to the Landfarm where passive treatment (natural attenuation) is allowed to occur.

Periodic testing of the soils undergoing treatment is conducted and analyzed by an independent laboratory to confirm the concentration of HTF. Once treatment has been completed and soil HTF concentrations are below 100-ppm (the permitted limit), remediated soils are available for reuse within the sites.

2.0 HTF RELEASES AND TREATMENT MONITORING

During the First Semester of 2007 approximately 125-130 cubic yards of HTF-impacted soils were generated. These HTF-affected soils were the result of remedial actions related to unanticipated releases that occurred on-site on 27 March and 27 February 2007. In both instances recovery of free-standing HTF product was implemented as soon as the release area was secured. The largest release occurred on 27 February 2007 which involved approximately 1,000 gallons of HTF in the SEGS VI solar field. Removal of HTF-impacted soil is typically initiated once free product is removed, however in the case of the 27 February 2007 event soil removal was temporarily suspended on 28 February due to high winds.

During the Second Semester of 2007 a release of approximately 30,000 gallons occurred on 16 July 2007 in the SEGS VII Power Block resulting in the generation of approximately 6,558 cubic yards of HTF-impacted soils. Recovery of free-standing HTF product was implemented as soon as the release area was secured.

Notification of releases was made to the California Regional Water Quality Control Board – Lahontan Region (RWQCB), National Response Center, California Office of Emergency Services, San Bernardino County Fire Department Hazardous Materials Division, and California Energy Commission on 01 March 2007, 30 March 2007, and 17 July 2007.

Soils affected with HTF as a result of the releases were promptly excavated and transported to the Landfarm facility for temporary storage. In the case of the 16 July 2007 release at the SEGS VII Power Block, approximately 6,408 cubic yards of HTF-affected soils were removed and transported offsite to an approved disposal facility and another 150 cubic yards was taken to the Bioremediation facility on site. Soil samples were subsequently collected from the excavations to determine if further soil removal was required. Soil sampling reports were prepared for each of the releases that summarized the methods employed for sample collection and laboratory analytical results. These reports have previously been submitted to the RWQCB.

Releases that occurred during 2007 are summarized in Table 1 below.

Table 1: Summary of 2007 HTF Releases

Release Date	Location	Volume of HTF Released
27 February 2007	SEGS VI SCA 39P	1,000 gallons
27 March 2007	SEGS V SCA 23P	35 gallons
16 July 2007	SEGS VII Power Block	30,000 gallons

3.0 OPERATION AND MAINTENANCE REPORTING

FPL Energy Operating Services, Inc. has not experienced any technical issues since assuming operational control of the Facility. Visual observations indicate that the structure of the bioremediation Unit is in good working order and that no obvious defects or structural damage is evident.

The Bioremediation Unit is constructed with two rectangular cells and a row of concrete blocks dividing the facility into two portions, a north and south half: One half of the structure is typically used to store HTF-impacted material prior to treatment and the other half for active soil remediation.

Visual inspection of the primary concrete containment structure was last conducted in 2007 on 31 December. No structural damage or signs of weakening or failure were visible at the time of inspection.

The drainage sumps for the Bioremediation Unit are checked approximately once a week. No significant accumulation of water has been noted in the sumps, suggesting that no leakage is occurring.

4.0 SAMPLING SUMMARY AND LABORATORY ANALYTICAL RESULTS

On 08 March 2007 Northstar Environmental Remediation (Northstar) conducted a random sampling of soil from the Landfarm. Northstar also collected compliance soil samples from the Bioremediation Unit on 11 June 2007. The sampling was performed to determine the concentration of HTF in impacted soils undergoing treatment. The 08 March soil samples were collected from materials which were generated from the February HTF release at SEGS VI and which were subsequently stored on plastic sheeting in the Landfarm Remaining soil in the Landfarm represents materials generated from an accidental HTF release at SEGS III in October 2005 which was subsequently tested and found to be below the 1,000 mg/kg limit.

On 19 December 2007 Northstar collected the annual "unsaturated zone monitoring system" soil sample at a depth equal to approximately one foot below the native ground surface grade (approximately 5.5 feet below the top of the landfarm for HTF. Both HTF analytes were found to be non-detectable as shown on Table 2.

The results of the laboratory analytical analyses for the First Semester 2007 reporting period are summarized in Table 2. Laboratory reports for the First Semester sampling events were previously included in the First Semester 2007 report. Laboratory data sheets and chain-of-custody record for the annual landfarm "unsaturated zone monitoring" soil sampling event are included in Appendix A.

Soil samples were collected using a stainless-steel hand-auger, and stainless-steel drive sampler equipped with clean 2-inch diameter by six-inch long stainless-steel sample sleeves. Samples were first collected in the stainless steel sleeves and then immediately transferred into laboratory-supplied, certified clean glass jars and properly labeled. The samples were then placed into a cooler, chilled with ice in sealed Ziploc™ bags and transported under chain-of-custody to Del Mar Analytical Laboratories in Irvine, California for analysis of HTF component concentrations using EPA Method 8015 Modified for HTF. Soil was collected from four randomly selected locations in the Bioremediation Unit, composited in the field and submitted to the laboratory to be analyzed as one representative sample. The same procedure was followed for the Landfarm soil sample.

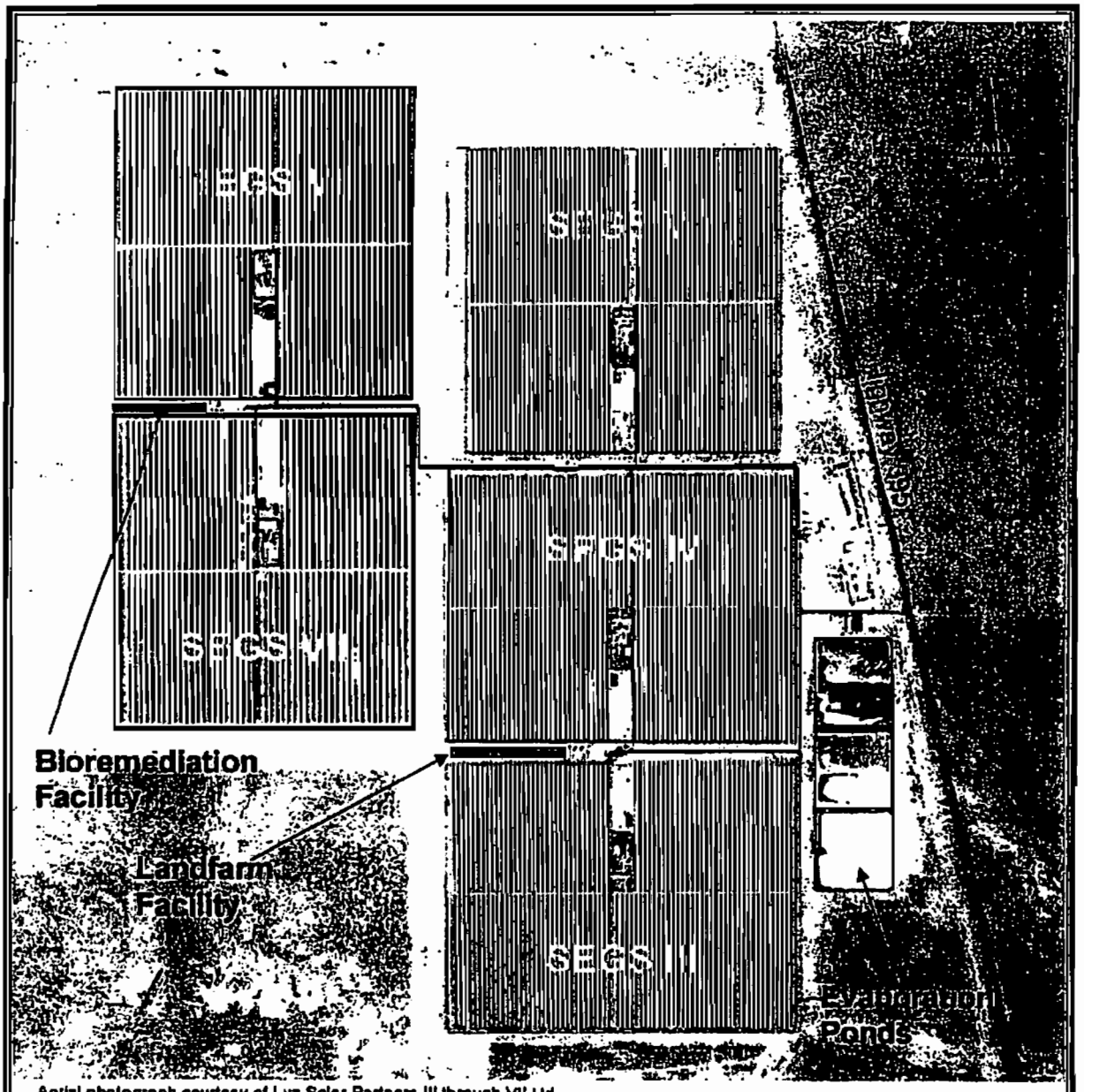
All equipment was cleaned using non-phosphate detergent and triple-rinsed with deionized water between sampling locations in order to prevent cross-contamination.

Table 2: Laboratory Analytical Results

Sample Identification	Date	1,1'-Biphenyl (mg/kg)	1,1'-Oxybisbenzene (mg/kg)
LF-1[1]	08 March 2007	7,900	8,200
LF-2[1]	08 March 2007	6,200	6,200
LF-3[1]	08 March 2007	1,700	1,800
BRN (EAST) 6-11-07[2]	11 June 2007	ND	2.1
BRN (WEST)6-11-07[2]	11 June 2007	ND	33
KJ-LF-5.5'-12-19-07	19 December 2007	ND	ND

Notes:

[1] sample collected from the Landfarm facility between SEGS III & IV
[2] sample collected from the Bioremediation facility between SEGS VI & VII
Samples analyzed by EPA Method 8015B Modified for HTF. The analytes 1, 1'-Biphenyl and 1, 1'-Oxybisbenzene are components of the HTF used at the site. ND = Not Detectable



Aerial photograph courtesy of Luz Solar Partners III through VII Ltd.

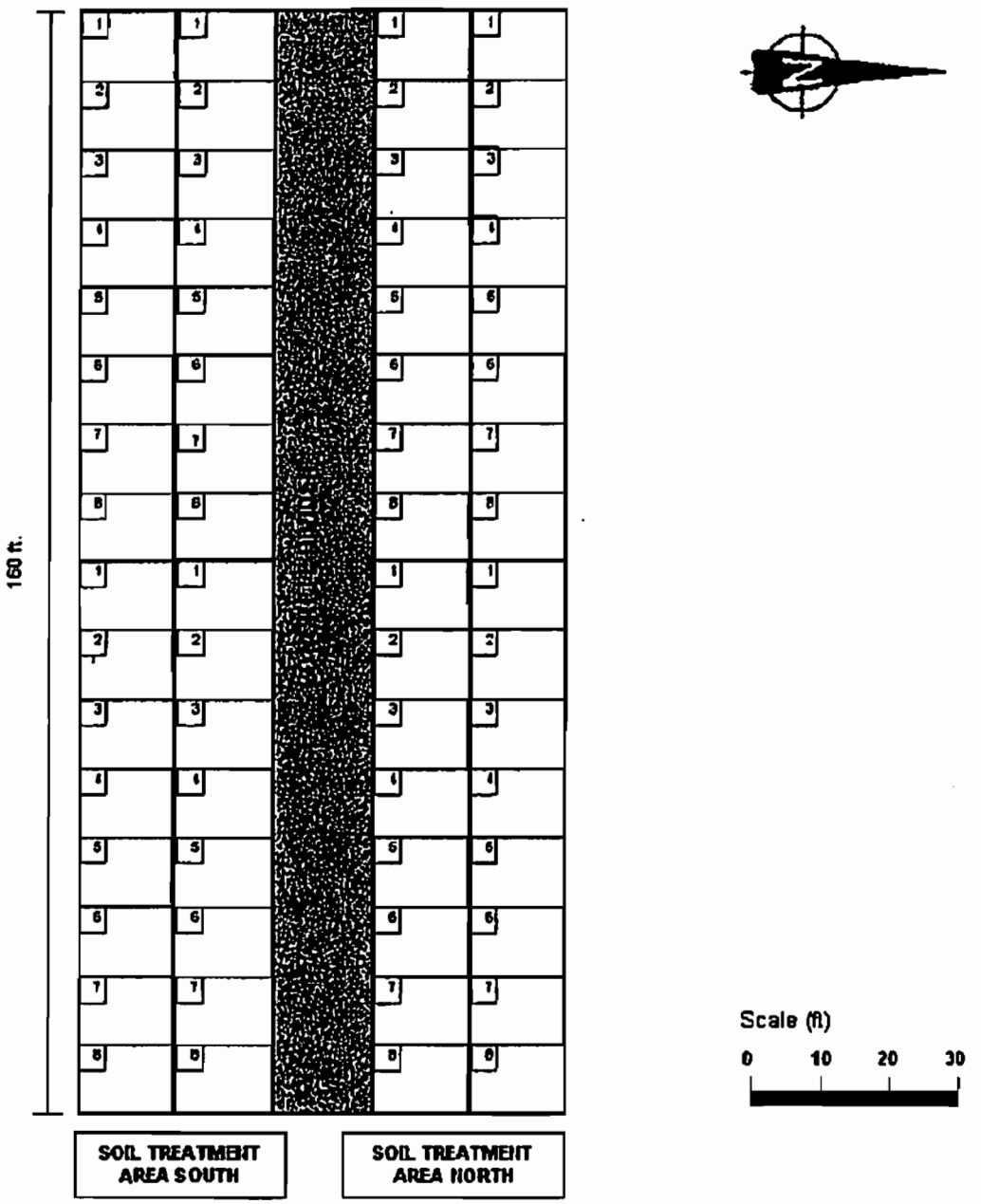
No scale

amec

Client: Luz Solar Partners III through VII Ltd.

Job No. CE03501 | Date: 26 June 2007

Figure I – Site Plan
SEGS III - VII
Boron, California



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Client: Luz Solar Partners III through VII Ltd.

Job No. CE03501 | Date: 10 January 2008

Figure 2
Bioremediation Unit Layout
SEGS III - VII
Boron, California

amec

Appendix A

Laboratory Data Sheets and Chain-of-Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
17461 Derian Avenue, Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

LABORATORY REPORT

Prepared For: FPL Energy Operating Systems
43880 Harper Lake Rd
Hinkley, CA 92347
Attention: Glen King

Project: FPL Kramer Junction

Sampled: 12/19/07
Received: 12/21/07
Issued: 01/03/08 11:40

NELAP #01108CA California ELAP#1197 CSDLAC #10256

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

CASE NARRATIVE

SAMPLE RECEIPT: Samples were received intact, at 4°C, on ice and with chain of custody documentation.

HOLDING TIMES: All samples were analyzed within prescribed holding times and/or in accordance with the TestAmerica Sample Acceptance Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made.

SUBCONTRACTED: No analyses were subcontracted to an outside laboratory.

LABORATORY ID	CLIENT ID	MATRIX
IQL2412-01	KJ-LF@5.5'-12-19-07	Soil

Reviewed By:

TestAmerica Irvine

Patty Mata
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
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FPL Energy Operating Systems 43880 Harper Lake Rd Hinkley, CA 92347 Attention: Glen King	Project ID: FPL Kramer Junction Report Number: IQL2412	Sampled: 12/19/07 Received: 12/21/07

THERMINOL (CADHS LUFT/8015B MOD)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IQL2412-01 (KJ-LF@5.5'-12-19-07 - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	7L21094	2.0	ND	1	12/26/2007	12/27/2007	
1,1'-Oxybisbenzene	EPA 8015 MOD.	7L21094	2.0	ND	1	12/26/2007	12/27/2007	C
Surrogate: n-Octacosane (40-125%)				*79 %*				

TestAmerica Irvine

Patty Mata
Project Manager

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FPL Energy Operating Systems 43880 Harper Lake Rd Hinkley, CA 92347 Attention: Glen King	Project ID: FPL Kramer Junction Report Number: IQL2412	Sampled: 12/19/07 Received: 12/21/07

METHOD BLANK/QC DATA

THERMINOL (CADHS LUFT/8015B MOD)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 7L21094 Extracted: 12/26/07										
Blank Analyzed: 12/26/2007 (7L21094-BLK1)										
1,1'-Biphenyl	ND	2.0	mg/kg							
1,1'-Oxybisbenzene	ND	2.0	mg/kg							
Surrogate: n-Octacosane	*6.00*		*mg/kg*	*6.67*		*90*	*40-125*			
LCS Analyzed: 12/26/2007 (7L21094-BS1)										
1,1'-Biphenyl	2.64	2.0	mg/kg	3.33		79	50-115			
1,1'-Oxybisbenzene	2.71	2.0	mg/kg	3.33		81	50-115			
Surrogate: n-Octacosane	*5.50*		*mg/kg*	*6.67*		*82*	*40-125*			
Matrix Spike Analyzed: 12/26/2007 (7L21094-MS1)					**Source: IQL2265-03**					
1,1'-Biphenyl	3.10	2.0	mg/kg	3.33	ND	93	35-120			
1,1'-Oxybisbenzene	3.17	2.0	mg/kg	3.33	ND	95	35-120			
Surrogate: n-Octacosane	*6.15*		*mg/kg*	*6.67*		*92*	*40-125*			
Matrix Spike Dup Analyzed: 12/26/2007 (7L21094-MSD1)					**Source: IQL2265-03**					
1,1'-Biphenyl	2.87	2.0	mg/kg	3.33	ND	86	35-120	8	30	
1,1'-Oxybisbenzene	2.95	2.0	mg/kg	3.33	ND	88	35-120	7	30	
Surrogate: n-Octacosane	*5.97*		*mg/kg*	*6.67*		*90*	*40-125*			

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FPL Energy Operating Systems 43880 Harper Lake Rd Hinkley, CA 92347 Attention: Glen King	Project ID: FPL Kramer Junction Report Number: IQL2412	Sampled: 12/19/07 Received: 12/21/07

DATA QUALIFIERS AND DEFINITIONS

C	Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

TestAmerica Irvine

Patty Mata
Project Manager

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FPL Energy Operating Systems 43880 Harper Lake Rd Hinkley, CA 92347 Attention: Glen King	Project ID: FPL Kramer Junction Report Number: IQL2412	Sampled: 12/19/07 Received: 12/21/07

Certification Summary

TestAmerica Irvine

Method	Matrix	Nelac	California
EPA 8015 MOD.	Soil	X	X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

TestAmerica Irvine

Patty Mata
Project Manager

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

IQL2412

CHAIN OF CUSTODY FORM

1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
4530 South 51st St Suite B-120 Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E Sunset Rd. #3, Las Vegas NV 89120 (702) 798-3620 FAX (702) 798-3621

IQL2412 Page 1 of 1

TAL 0013(1007)

Client Name/Address: FPL-Kramer Junction, 41100 Highway 395, Boron, CA 93516

Project/PO Number: FPL-Kramer Junction

Project Manager: Glen Kling

Phone Number: (760) 762-5562

Sampler: Paul DeLaPena

Fax Number:

Analysis Required: 8015 modified for Thermal

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	8015 modified for Thermal	Special Instructions
KJ-LF@5.5'-12-19-07	Soil	4oz Jar	1	12-19-07	1235	on Ice	X	

HO 12/21/07 19:20

Relinquished By:	Date/Time:	Received By:	Date/Time:	Turnaround Time: (Check)
[signature]	12-21-07 @1850			same day ____ 72 hours ____
Relinquished By:	Date/Time:	Received By:	Date/Time:	24 hours ____ 5 days ____
				48 hours ____ normal X
Relinquished By:	Date/Time:	Received In Lab By: [signature]	Date/Time: 12/21/07 18:50	Sample Integrity: (Check) Intact X on ice 5.5/4.4

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

ATTACHMENT 3

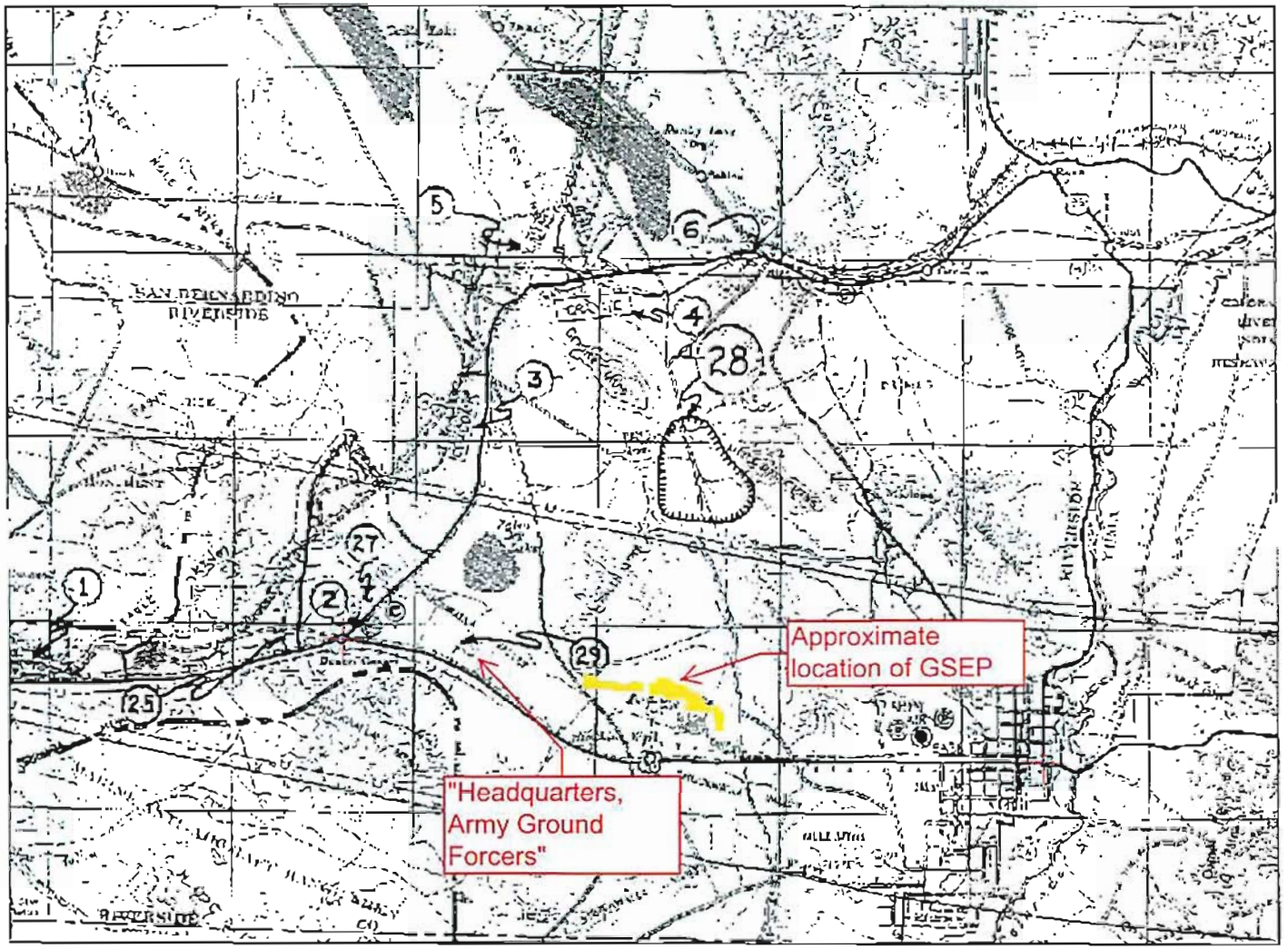
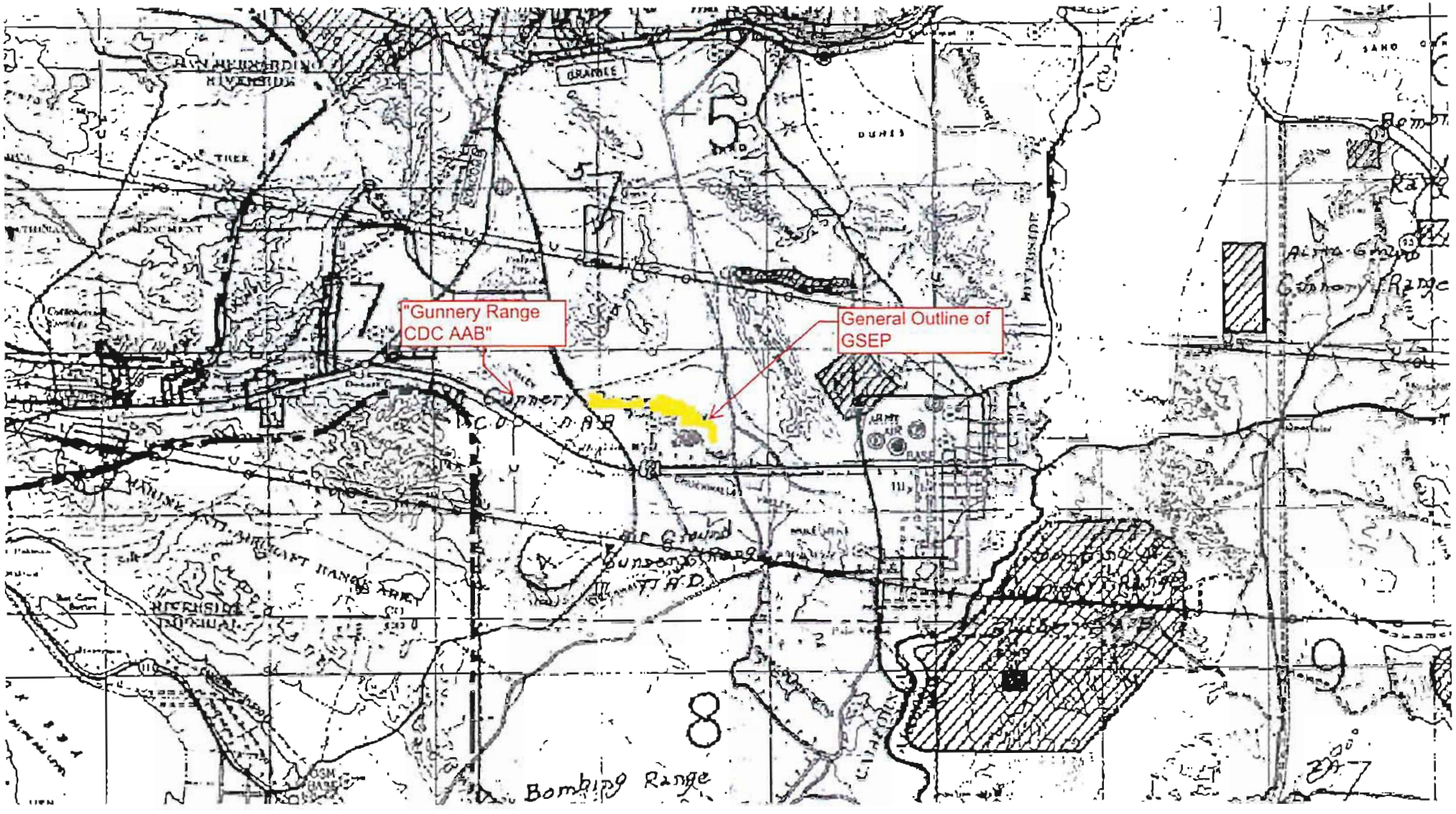


Figure 27. Map of a portion of the DTC/C-AMA, showing installations. The Palen Pass Defensive Area (a maneuver area) is marked 28. Other installations include the following: Camp Young, 1; Desert Center Observers Camp, 2; Camp Coxcomb, 3; Camp Granite, 4; Camp Iron Mountain, 5; Freda Railroad Siding, 6; Eagle Mountain Road Medical Installations, 25; Desert Center A.A.D., 27; and 18th Ordnance Battalion Camp near Desert Center, 1 and 29 (Headquarters Army Ground Forces 1943).

ATTACHMENT 4


"Gunnery Range CDC AAB"
General Outline of GSEP
Bombing Range
Gunnery
Air Ground
Gunnery Range
T.H.D.
Alma Group
Gunnery Range
DUNES
GRANDE
RIVERSIDE
5
7
8
9

ATTACHMENT C
OKIN COMMENTS

July 8, 2010

Allison Shaffer, Project Manager
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, CA 92262
Email: CAPSSolarNextEraFPL@blm.gov

Re: Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

I have reviewed those documents that address evidence of offsite ecological impacts of the project known as the Genesis Solar Energy Project ("Project") in eastern Riverside County. It is my opinion that the aforementioned documents have inadequately portrayed the potential for there to be offsite impacts from the western portion of the installation (i.e. from the eastern side of the Project's western solar array to the western boundary of the Project).

I am an Associate Professor of Geography at the University of California, Los Angeles, having received my Ph.D. from the California Institute of Technology in 2001. I maintain an active research program as a member of the Faculty at UCLA, with particular emphasis on deserts. My dissertation research was conducted not far from the Project site, between Baker and Barstow in San Bernardino County. I have written and taught extensively on the topic of soils and ecology of deserts. My *curriculum vitae* is attached as Attachment 1.

My critique centers on three primary areas of concern. (1) The potential hydrological effects of the western portion of the installation on vegetation downstream (south) of the Project; (2) the potential effects of the western portion of the installation on erosion and soil mobilization from the Project; and (3) the potential for stabilization of disturbed areas within the western portion of the installation. The western portion of the installation lies primarily on an alluvial surface mapped as Qal and Qoaf (Worley Parsons, 2010). I do not dispute this mapping, but do dispute claims made in both the Geological Report (GR; Worley Parsons, 2010) and the Revised Staff Assessment (RSA) on the ecological and geomorphic functioning of these units. It is my opinion that the Project would significantly impact these geomorphic surfaces and that dismissal of impacts on these surfaces, as well as the offsite areas downwind and downstream, as insignificant is not appropriate.

2. Hydrological impacts on vegetation south of the Project

The Applicant plans on implementing a Drainage Plan (Appendix E, Fig 19 of RSA) that involves channelization of flow from ephemeral streams to divert around the solar arrays, with spreading of the redirected flow downstream of the Project. This type of water control has been used throughout the Mojave Desert, as acknowledged by the RSA, and nearby along the I-10 corridor. Based on a site visit, the RSA suggests that this drainage plan will have little to no effect on local geomorphology and desert vegetation.

A significant amount of research has been conducted along the western flank of the nearby Coxcomb Mountains on the geomorphic and ecological impact of water diversions which were constructed to protect the Colorado River aqueduct. Schlesinger and Jones (1984) showed that the diversions caused significant decreases in plant density and overall biomass for two key Sonoran creosote bush scrub species (*Larrea tridentata* and *Ambrosia dumosa*) as well as an increase in mortality of larger specimens of *L. tridentata.* This research and that of Schlesinger et al. (1989) shows that overland flow from upstream on alluvial desert piedmonts ("bajadas") is key to the maintenance of biological productivity. Sonoran creosote bush scrub communities aren't simply reliant upon direct precipitation for their water. Water is concentrated and stored in soils during rain that produces overland flow, and this water contributes to the survival and reproduction of shrub species that serve as habitat for much of the fauna of the region.

There will be significant areas of the bajada south (downstream) of the western solar array that will be blocked from overland flow. Though the redistribution channels on the south side of the solar array will reduce these impacts, and will also reduce the potential for increased fluvial erosion due to concentrated water flow, there will also be considerable areas that will be completely blocked from overland flow (Appendix E, Fig 19, RSA). These areas can be expected to experience reduced growth and shrub mortality of the type documented by Schlesinger and Jones (1984).

Thus, it is my opinion that the Project's diversion of flow from small ephemeral channels would result in significant offsite impacts to vegetation that have not been adequately addressed by the RSA.

3. The potential effects of the western portion of the installation on erosion and soil mobilization from the Project

It is my opinion that the mapping of the geomorphic units in the western portion of the Project is correct. However, I believe that the interpretation of the meaning of these geomorphic units is outdated and their potential response to disturbance is inadequately addressed by the RSA.

The Qal and Qoaf surfaces are discussed in both the GR and the RSA as comprised of a lag gravel atop finer-grained sediments. They take the presence of this so-called lag

gravel, desert varnish and rubification of surface clasts, and the presence of subsurface soil horizons as evidence that these surfaces have been "stable for 1000s of years", implying that "sand deposition is not taking place" (Appendix E, p. 9, RSA). The RSA concludes that "from a geomorphic perspective, construction of the project on the Qal should have relatively little off-site impact because there is little sediment transport occurring on this surface, construction of the proposed project does not appear likely to disrupt the movement of sediment to habitat areas" (Appendix E, p. 19, RSA). My experience and the scientific literature disputes this conclusion.

Both the GR and the RSA are incorrect in classifying the clasts on the surface of the Qal unit as a lag deposit. The GR and RSA's approach to pavement formation holds that large clasts are concentrated at the surface by the continual erosion (by wind or water) of fine particles. I know of no evidence for deflationary pavement on an alluvial fan within the Mojave Desert.

Rather, a series of papers in the scientific literature (e.g., McFadden et al., 1987; Wells et al, 1995; Anderson et al, 2002) studied the development of desert pavements in the Mojave Desert (along Kelbaker Road between Kelso and Baker, San Bernardino County in the Cima volcanic field). Through a series of geomorphic, geochemical, and micromorphometric techniques, these studies show that desert pavements arise when large surface clasts rise vertically on an accreting aeolian mantle. In essence, pavements arise when wind-blown material is deposited on the top of large clasts and is washed underneath them by subsequent rains. Depending on the age of the surface, meters of material can accumulate in this way, and geochemical evidence suggests that the clasts on the surface have, since their original deposition, remained at the soil surface.

Given the amount of aeolian activity that occurs naturally in the area near the Project, evidenced by clear sand transport corridors both east and south of the Project as well as the prevalence of dust storms in the basin, the pavements observed on the Qal surface (incorrectly called 'gravel lag deposits') are almost certainly accretionary pavements. In the field, these accreting mantles can be identified clearly by the presence of a so-called Av horizon, or vesicular A horizon, in the fine-grained sediments just below the large surface clasts. Photographs and descriptions of the soils in the western portion of the Project (e.g. Plates 11B, 12B, and 24B) indicate the presence of this Av horizon, thus strengthening the case that this is an accretionary surface.

The RSA is correct to conclude, nonetheless, that the Qal surface has been stable for thousands of years. The continual presence of the clasts atop the surface have allowed for slow processes (such as the formation of varnished surfaces and the formation of subsurface soil horizons) to take place even while there was a slow accumulation of material within the accretionary mantle.

Removal or disturbance of the pavement clasts that protect the surface can be expected to have major impacts on the availability and transport of wind-borne material. A study by Belnap et al. (2007) found that even minor disturbances, such as that caused by a

single vehicle pass, leads to significant decreases of the threshold wind speed (the wind speed at which particle movement is initiated) and increases in the total amount of aeolian flux observed. Several other studies have also determined the impact of the disturbance of desert soils on threshold wind speed and sediment flux (e.g., Gillette, 1980; Field et al. 2010), all concluding that even modest disturbance can lead to significantly increased aeolian activity.

This is particularly the case with accretionary desert pavements. The aeolian materials *that* have been protected for millennia beneath the surface clasts are highly erodible due to their original aeolian origin. Studies from the Cima volcanic fields (Anderson et al., 2002) show that the accretionary mantle is largely made of fine sands and silt-sized particles which are easily moved by the wind once exposed at the surface.

Also within the western portion of the Project is the Qsr geomorphic unit comprised of relict sand sheets displaying a low degree of aeolian activity under current conditions. This surface, too, can be expected to be largely remobilized once surface disturbances associated with the Project are initiated.

Thus, the large-scale disturbance that is to occur on the Qal and Qsr geomorphic surfaces in the western portion of the Project will lead to extensive new aeolian activity. Given the predominant southwestern wind direction, this will mean that a plume of sand, eroded from the disturbed area, will begin to extend from the southern edge of the Project.

In my own research, I have investigated the impacts of this sort of sand plume originating from disturbed soils, on nearby vegetation communities that were not directly disturbed. The relevant publications are Okin et al. (2001a, 2001b, 2006, and 2009). What occurs during this enhanced aeolian activity is that sand, blown from the area of the disturbance, is deposited on the downwind area, potentially burying plants. While it is moving, the sand can abrade, damage, and/or kill offsite vegetation, and the removal of fine-particles during transport (i.e. "winnowing") leaves the deposited soil with lower water-holding capacity, cation-exchange capacity, and lower levels of critical nutrient elements such as C, N, and P. The result is a downwind area with reduced vegetation cover, reduced soil fertility, shifting sands, and lower probability of establishment of new vegetation.

Of course, any disturbance of the soil surface that encourages increased aeolian activity in a soil with dust-sized (< 50 um) particles, will also lead to the production of dust. The potential for the Project to increase dust emission from the site has been evaluated in the RSA, though the emphasis appears to have been on dust emissions from vehicles, and mitigation techniques for vehicular fugitive dust emissions differ from those that would be required on large areas of land disturbed land. The potential for mitigation of both the sand and dust impacts of disturbances associated with the project will be addressed in the next section.

Thus, in my opinion the Qal and Qsr surfaces, while stable in the absence of a disturbance, have the potential to become significant sources of offsite impacts in terms of both biological resources (e.g., vegetation and fauna in the downwind area) and air resources (e.g., dust). The potential for these surfaces to yield significant offsite impacts appears to have been inadequately evaluated in the RSA. Though the staff identified the potential of the Project to increase dust emissions, the potential for the wind-driven impact on the area immediately downwind of the Project was not considered by the Staff.

4. The potential for stabilization of disturbed areas within the western portion of the Project

As mentioned above, the RSA did evaluate the potential of the Project to increase fugitive dust emissions in the basin and in the absence of effective mitigation, determined that the Project would likely have significant impacts on air quality. In light of this, the RSA has required a set of fugitive dust mitigation measures (RSA C1.-44 to 45). All but one of these focus on roads and vehicular traffic as sources of fugitive dust emissions. The only item to discuss the potential of surface disturbance to cause fugitive dust emissions reads:

> n. Wind-erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered by vegetation.

With the exception of chemical dust suppressants, which probably do not significantly reduce the movement of sand grains, the wind erosion control techniques might also be suggested to be useful in the mitigation of wind erosion (sand transport) from disturbed areas. Dust emission and wind erosion are tightly linked: saltation of sand-sized particles is initiated when the wind speed exceeds the wind speed required for transport. At this threshold windspeed, the finer particles that comprise the "dust" fraction are still held to the surface by interparticle forces. However, upon the initiation of saltation, moving particles impart sufficient energy to the surface when they strike it to liberate the dust-sized particles from the surface. These particles then become suspended in the air flow and leave the area as "fugitive dust".

However, it is my opinion that the measures required by the RSA to mitigate fugitive dust emissions from disturbed areas (i.e. not roads and not including dust emission from vehicular traffic) are insufficient to mitigate significant impacts from wind erosion, including offsite effects discussed above. Because wind erosion and dust emission are so tightly linked in disturbed areas, I also do not think that the required mitigation measures will significantly impact fugitive dust emissions from disturbed areas.

By far the most important factor controlling the erodibility of the surface by wind is the threshold wind velocity at which particle transport is initiated. A surface with a sufficiently high threshold wind velocity is not wind erodible even in the absence of vegetation or other objects such as windbreaks. If, on the other hand, the threshold wind velocity is sufficiently low so as to make the soil erodible under natural wind conditions, windbreaks and vegetation have limited ability to reduce the amount of aeolian activity that the surface will experience.

As discussed above, even light disturbance can reduce the threshold wind velocity sufficiently to make soils highly erodible. Disturbance at the level envisioned in this Project (grading) is sure to make the soils extremely wind erodible. There is very little reduce the erodibility of the surface once it has been disturbed. As evidence of this, I point to my own research in the Manix Basin of the Mojave Desert between Barstow and Baker along I-15 (Okin et al. 2001b). In this area, soils were disturbed for agricultural purposes, though many of the fields were later abandoned. For the purposes here, the most notable aspect about the trajectory that this area took after the abandonment of agriculture is that, on some of the fields, vegetation grew back to covers several times that found in the pre-disturbance vegetation (e.g., 30% cover vs. 5 - 10% cover). Despite this, the fields with significant vegetation cover remained the source for blowing sand plumes downwind of the abandoned fields. This illustrates that, even if permanent vegetation recovers on disturbed areas, it is highly unlikely that wind erosion will be reduced in the decades following the establishment of the Project.

To make matters worse, vegetation recovery in the Mojave Desert is famously slow. A review by Lovich and Bainbridge (1999) suggested that vegetation recovery in the deserts of California takes between 50 - 300 years, with full recovery taking up to 3000 years. Recovery interventions are expensive and have low probability of success.

Thus, it is clear that natural recovery processes cannot be counted upon to limit wind erosion, and potentially dust emission, from disturbed areas. Even if vegetation recovers quickly through natural means or human intervention, my research shows that once the soil surface has been disturbed there is little that can be done to limit wind erosion and dust emission.

Windbreaks can hardly be expected to be more effective at erosion control than vegetation. The efficacy of windbreaks or chemical dust suppressants in limiting wind erosion and dust emission must be made based on the specifics of the system to be used, but there are good reasons to believe that these will not be completely effective in limiting wind erosion and dust emission. Windbreaks, for example, like plants, do not completely eliminate wind in their lee. They function to reduce the wind speed in their lee, but this effect decreases as the distance from the windbreak increases (Bradley and Mulhearn, 1983) becoming minimal at a distance of about 5 times the height of the windbreak. To be effective in limiting wind erosion (rather than dust emission) a chemical dust suppressant must be able to bind all of the most wind-erodible particles (~70 um) on the surface. However, it is my understanding that chemical dust

suppressants act to aggregate dust-sized particles limiting their ability to become suspended.

In sum, the measures required by the RSA for mitigating fugitive dust emissions from disturbed areas are insufficient to mitigate significant impacts from wind erosion, including the offsite effects discussed above.

Sincerely,

Greg Okin

Greg Okin

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ATTACHMENT 1

GREGORY STEWART OKIN

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EDUCATION

Postdoctoral Research:	Department of Geography, University of California, Santa Barbara, Mentor: Oliver A. Chadwick	2001-2002
Ph.D.	Geochemistry, California Institute of Technology Wind-Driven Desertification: Process Modeling, Remote Monitoring, and Forecasting. Thesis Advisors: Bruce Murray, William H. Schlesinger.	2001
M.S.	Geology, California Institute of Technology	1997
B.A.	Chemistry & Philosophy (Double Major), Middlebury College	1995

APPOINTMENTS AND POSITIONS

Editor, *Reviews of Geophysics*	2010 – Present
University of California, Los Angeles, Dept. of Geography, Associate Professor	2008 – Present
New Mexico State University, Dept. of Plant and Environmental Science, Adjunct	2007 – Present
University of California, Los Angeles, Dept. of Geography, Assistant Professor	2006 – 2008
University of Virginia, Dept. of Environmental Sciences, Assistant Professor	2002 – 2006
University of California, Santa Barbara, Dept. of Geography, Postdoctoral Researcher	2001 – 2002
California Institute of Technology, Div. of Geol. and Plan. Sci., Graduate Student	1995 – 2001
Middlebury College, Undergraduate Student Researcher	1994 – 1995
University of Denver, Dept. of Chemistry, Undergraduate Researcher	1994 – 1995

GRANTS AND CONTRACTS

University of California, Los Angeles (2006-present)

Jornada Basin LTER V: Landscape Linkages in Arid and Semiarid Ecosystems. (NSF-LTER). Current NSF Long Term Ecological Research grant to study desertification and remediation processes in the Chihuahuan Desert. Co-Investigator. PI: Peters. Total Grant: $4.92M.

The Effect of Sandblasting on Desert Plant Physiology. (Sol Leshin Program for Collaboration between UCLA and BGU in Plant Sciences & Social Sciences & Humanities) Grant with Haim Tsoar of Ben Gurion University to conduct experiments on sandblasting of US and Israeli plant species. PI: Okin. Total Grant: $25,000.

Determining rates of dust emission and wind erosion on US Rangelands: A National Assessment. (National Resource Conservation Service) Grant to conduct field measurements for calibration of a wind erosion model. PI: Okin. Total Grant: $150,000.

Distribution and Dynamics of Belowground Carbon in Savannas. (NSF-DEB). Grant to study belowground carbon in the Kalahari Desert of Botswana. PI: Okin. Total Grant: $700,000. Additional REU and RET supplement in 2008. Additional REU supplement in 2008-2010.

Quantifying feedbacks between groundwater decline, wind erosion, and ecological change in desert vegetation. (NSF-EAR). Grant to study vegetation change and wind erosion associated with groundwater decline in the Owens Valley of California. PI: Elmore. Total Grant ~$450,000.

Field spectroscopy in support of aeolian geomorphology, snow hydrology, and teaching at UCLA. (NSF-EAR). Grant to acquire an ASD FieldSpec portable spectroradiometer and accessories. PI: Okin. Total Grant: $89,000.

Dust Hotspots: An advanced method for characterizing desert dust sources. (UCLA FRG). Grant to use LIDAR to detect patterns of dust emission in the Chihuahuan Desert. PI: Okin. Total Grant: $10,000.

University of Virginia (2002 – 2006)

Remote Spectral Identification of Human Activities. (DOD) Grant to study the spectral signature of human activities in arid and semiarid environments with the purpose of improving remote intelligence. Grant supports UVA Ph.D. student and UCLA visiting student Cheney Shreve. PI: Okin (2005-2006), Fuentes (2006-2008). Total Grant to date: $70,000. 2006-2008

The Role of Wind Erosion in Ecosystem Change in Desert Grasslands. (NSF-DEB Ecosystem Studies) Grant to measure and model the effects of wind on nutrient loss and vegetation change in grasslands of the Southwest. PI: Okin. Total Grant: $500, 000. Includes REU Supplemental Grant in 2006. 2003-2006

Hydrological and nutrient controls on the structure and function of southern African savannas: A multi-scale approach. (NASA-IDS) Grant to assess the feedback and stability of interactions in the savanna ecosystems of southern Africa. Co-Investigator. PI: Shugart. Total Grant: $900,000 2004-2007

Feedbacks between vegetation change and dust emission in deserts: a novel observational approach. (UVA Fund for Excellence in Science and Technology) Grant to assess the use of LIDAR for landscape-scale analysis of wind erosion and dust emission. PI: Okin. Total Grant: $50,000 2005-2006

Planning Visit: Nutrient, hydrologic, and physiological controls on belowground productivity and carbon sequestration in Kalahari savanna ecosystems. Funds for visit to Botswana for planning of savanna carbon sequestration proposal. PI: Okin. Total funds: $22,000. 2005-2006

California Institute of Technology, Graduate Student (1995 – 2001)

Supercomputing Visualization Workbench. (Caltech President's Fund) Grant to develop high-performance imaging spectrometer data analysis tools. Principal grant author and research leader. PI: Murray. 1998-1999

Time Critical Observations for Arid Region Greening. (NASA-OES) Grant to collect and analyze AVIRIS data and field spectra. Principal grant author and research leader. PI: Murray. 1997-1998

FELLOWSHIPS AND AWARDS

Editors' Citation for Excellence in Refereeing for JGR-Atmospheres 2008
UCLA Academic Advancement Program Faculty Appreciation Award 2008

NASA Earth Sciences Enterprise Fellowship	1998-2000
Koons Fellowship in Geological and Planetary Sciences	1998
Conoco Fellowship in Geological and Planetary Science	1995-1996
Valedictorian, Middlebury College Class of 1995	1995
Junior Phi Beta Kappa	1994
NSF REU Fellowship, University of Denver	1994

OTHER RESEARCH EXPERIENCE

Middlebury College, Undergraduate Student (1991 – 1995)

Variable-Field Variable-Temperature Magnetic Circular Dichroism of Co(II) Monomers and Dimers. Undergraduate Chemistry Thesis. PI: Larrabee. 1994-1995

University of Denver, Undergraduate Researcher (1994 – 1995)

Laser-induced emission from NFCl radicals isolated in low-temperature argon matrices. Summer Research. Mentor: Gilbert. 1994-1995

PUBLICATIONS

Journal Articles Submitted or In Preparation

Katjiua, Mutjinde, L. Wang, P. D'Odorico, G. S. Okin, Submitted, Nutrient and water limitations in savanna vegetation along the Kalahari rainfall gradient, *Journal of Arid Environments*

Ballantine, J.A., N.M. Mahowald, G.S. Okin, T. Dunne, Submitted, Temporal and spatial influences of precipitation and landforms on low visibility in North Africa. *Journal of Geophysical Research.*

Ravi, S., P. D'Odorico, D.D. Breshears, J.P. Field, A.S. Goudie, T.E. Huxman, G.S. Okin, R.J. Swap, A.D. Thomas, S. van Pelt, J.J. Whicker, T.M. Zobeck, submitted, Aeolian processes and the biosphere: Interactions and feedback loops, *Reviews of Geophysics.*

Okin, G.S., P. D'Odorico, In Preparation, Counterintuitive effect of climate fluctuations on grass invasions in fireproof desert shrublands, *New Phytologist*

Stewart, J., A.J. Parsons, J. Wainwright, G.S. Okin, B.T. Bestelmeyer, E.L. Fredrickson, W.H. Schlesinger, In Preparation, Modelling emergent patterns of dynamic desert ecosystems as a function of changing landscape connectivity, *Ecological Modelling.*

Alvarez, L.J., H.E. Epstein, J. Li, G.S. Okin, submitted, The effects of grass reduction and increased wind erosion on photosynthesis rates of desert grassland plants. *Oecologia.*

Shreve, C.M., G.S. Okin, T.H. Painter, In Preparation, Spatial and temporal trends in fractional snow covered area and daytime land surface temperature in the Tibetan Plateau 2000-2007 using MODIS data. *Environmental Science Letters.*

Alvarez, L.J., G.S. Okin, H.E. Epstein, in preparation, Evaluation of current shear stress partitioning models in a sparsely vegetated ecosystem, *Journal of Geophysical Research-Earth Surfaces.*

Alvarez, L.J., G.S. Okin, H.E. Epstein, J. Li, in preparation, Spatial distribution of vegetation in a desert environment.

Alvarez, L.J., G.S. Okin, H.E. Epstein, J. Li, in preparation, Community responses to wind erosion.

Peer-Reviewed Journal Articles and Articles in Press

Okin, G.S., 2010. The contribution of brown vegetation to vegetation dynamics, *Ecology*, v. 91, pp. 743-755.

Estes, L.D., P.R. Reillo, A.G. Mwangi, G.S. Okin, H.H. Shugart, 2010 Remote sensing of forest structural complexity indices or habitat and species distribution modeling, *Remote Sensing of Environment,* 14, p. 792-804.

Field, J.P., J. Belnap, D.D. Breshears, J.C. Neff, G.S. Okin, J.J. Whicker, T.H Painter, S. Ravi, M.C. Reheis,

R.L. Reynolds, In Press, The ecology of dust: local- to global-scale terrestrial perspectives, *Frontiers in Ecology and the Environment.*

Myint, S.W., A. Brazel, G.S. Okin, A. Buyantuyev, In Press. Combined effects of impervious surface and vegetation cover on the urban heat island effect in a rapidly expanding desert city, *IEEE Journal of Selected Topics in Earth Observations and Remote Sensing.*

Li, J., G.S. Okin, H.E. Epstein, 2009, Effects of enhanced wind erosion on surface soil texture and characteristics of windblown sediments, *Journal of Geophysical Research-Biogeosciences, 114.*

Ravi, S., P. D'Odorico, L. Wang, C. White, G.S. Okin, S.A. Macko, S. Collins, in press, Post-fire resource redistribution in desert grasslands: A possible negative feedback on land degradation, *Ecosystems*, 12(3): 434-444.

Shreve, C.M., G.S. Okin, T.H. Painter, 2009, Introduction of a new optical snow index and validation of optical snow indices for estimating fractional snow cover in the Western Tibetan Plateau. *Journal of Glaciology*, 55(192): 737-745.

Li, J., G.S. Okin, L.J. Alvarez, and H.E. Epstein, 2009, Sediment deposition and soil nutrient heterogeneity in two desert grassland ecosystems, southern New Mexico, *Plant and Soil,* 319(1-2): 67-84..

Wang, L., P. D'Odorico, G.S. Okin, S. Macko, 2009, Isotopic composition and anion chemistry of soil profiles along the Kalahari Transect, *Journal of Arid Environments,* 73(4-5): 480-486..

Wang, L., Okin, G.S., Macko, S.A., 2009, Satellite prediction of soil $\delta^{13}C$ distributions in a southern African savanna, *Journal of Geochemical Exploration*, 102, 137-141.

Gu, J., X. Li, C. Huang, G.S. Okin, 2009, A simplified data assimilation method for reconstructing time-series MODIS NDVI data, *Advances in Space Research*, 44, 501-509.

Wang, L., G.S. Okin, K. K. Caylor, S. Macko, 2009, Spatial heterogeneity and sources of soil carbon in southern African savannas, *Geoderma*, 149, 402-408.

Okin, G. S., P. D'Odorico, and S. R. Archer, 2009, Impact of feedbacks on Chihuahuan desert grasslands: Transience and metastability, *Journal Geophysical Research - Biogeosciences*, 114, G01004, doi:10.1029/2008JG000833

Okin, G.S. A.J. Parsons, J. Wainwright, J.E. Herrick, B.T. Bestelmeyer, D.P.C. Peters, and E.L. Fredrickson, 2009, Do changes in connectivity explain desertification? *BioScience*, 59 (3): 237-244.

Mahowald, N., T.D. Jickells, A.R. Baker, P. Artaxo, C.R. Benitez-Nelson, G. Bergametti, T.C. Bond, Y. Chen, D.D. Cohen, B. Herut, N. Kubilay, R. Losno, C. Luo, W. Maenhaut, K.A. McGee, G.S. Okin, R.L. Siefert, S. Tsukuda, 2008. The global distribution of atmospheric phosphorus deposition and anthropogenic impacts, *Global Biogeochemical Cycles.* 22, GB4026, 10.1029/2008GB003240.

Myint, S., G.S. Okin, In Press, Modeling urban land covers using multiple endmember spectral mixture analysis, *International Journal of Remote Sensing.*

Elmore, A.J., J.M. Kaste, G.S. Okin, M.S. Fantle, 2008. Groundwater influences on atmospheric dust generation in deserts, *Journal of Arid Environments*, 72(10), 1753-1756.

Marshall, J.D., J.M Blair, D.P.C. Peters, G.S. Okin, A. Rango, M. Williams, 2008, Predicting and understanding ecosystem responses to climate change at continental scales, *Frontiers in Ecology and the Environment*, 6(5) pp 273-280. doi: 10.1890/070165

Li, J., G.S. Okin, L.J. Alvarez, and H.E. Epstein, 2008, Effects of wind erosion on the spatial heterogeneity of soil nutrients in two desert grassland communities, *Biogeochemistry,* 8(1) pp. 73-88, 10.1007/s10533-008-9195-6.

Okin, G.S., N. Mladenov, L. Wang, D. Cassel, K. K. Caylor, and S. Ringrose, 2008, Spatial patterns of soil nutrients in two southern African savannas, *JGR-Biogeosciences, 113:G02011.*

Estes, L.D., G.S. Okin, A.G. Mwangi, H.H. Shugart, 2008, Identifying a large forest herbivore's habitat: a multi-scale approach combining field data and imagery from four sensors, *Remote Sensing of Environment*, 112: 2033-2050.

Okin, G. S., 2008, A new model of wind erosion in the presence of vegetation, Journal of Geophysical Research-Earth Surface, 113, F02S10, doi:10.1029/2007JF000758.

Ravi, S., D'Odorico, P., and G.S. Okin, 2007, Hydrologic and aeolian controls on vegetation patterns in arid

landscapes, *Geophysical Research Letters*, 34, L24S23, doi:10.1029/2007GL031023.

D'Odorico, P., K.K. Caylor, G.S. Okin, T.M. Scanlon, 2007, On soil moisture-vegetation feedbacks in dryland plant ecosystems, *JGR-Biogeosciences, 112,* G04010, DOI: 10.1029/2006JG000379

Li, J., G.S. Okin, L.J. Alvarez, and H.E. Epstein, 2007, Quantitative assessment of wind erosion and soil nutrient loss in desert grasslands of the southwestern United States, *Biogeochemistry*, 10.1007/s10533-007-9142-y, 85(3) 317-332.

Diekmann, L., D. Lawrence, and G.S. Okin, 2007. Changes in the spatial variation of soil properties following shifting cultivation in a Mexican dry tropical forest, *Biogeochemistry*, 10.1007/s10533-007-9107-1.

Okin, G.S., 2007, Relative Spectral Mixture Analysis - a multitemporal index of total vegetation cover, *Remote Sensing of Environment*, 106(4), 467-479.

Wang, L., G.S. Okin, J. Wang, H.E. Epstein, and S. Macko, 2007, Predicting ^{15}N concentration from Reflectance Spectra (400-2500 nm) at Leaf and Canopy Scales, *Geophysical Research Letters*, 35, L02401, doi:10.1029/2006GL028506

Scull, P. and G.S. Okin, 2007, Sampling challenges posed by continental scale soil landscape modeling, *Science of the Total Environment*, 372, 645-656.

McGlynn, I.O., and G.S. Okin, 2006, Characterization of shrub distribution using high spatial resolution remote sensing: ecosystem implication for a former Chihuahuan Desert grassland. *Remote Sensing of Environment*, 101, 554-566.

Ravi, S., T.M. Zobeck, T.M. Over, G.S. Okin, and P. D'Odorico, 2006, On the effect of wet bonding forces in air-dry soils on threshold friction velocity of wind erosion, *Sedimentology*, doi: 10.1111/j.1365-3091.2006.00775.x,

Okin, G.S., D.A. Gillettte, and J.E. Herrick, 2006, Multi-scale controls on and consequences of aeolian processes in landscape change in arid and semiarid environments, *Journal of Arid Environments*, 65, 253-275.

Mahowald N.M, P.E. Artaxo, A.R. Baker, D. Jickells, G.S. Okin, J.T. Randerson, and A.R. Townsend, 2005. Impacts of biomass burning emissions and land use on Amazonian atmospheric phosphorus cycling and deposition, *Global Biogeochemical Cycles*, 19, No. 4, GB4030, 10.1029/2005GB002541.

Scull, P., G. Okin, O.A. Chadwick, and J. Franklin, 2005. A comparison of methods to predict soil surface texture in an alluvial basin, *Professional Geographer*, 57(3), 423-437.

Ballantine, J.A.C., G. S. Okin, D.E. Prentiss, and D.A. Roberts, 2005. Mapping North African landforms using continental-scale unmixing of MODIS imagery, *Remote Sensing of Environment*, 47(4) 470-483.

Okin, G.S., 2005. Dependence of wind erosion on surface heterogeneity, *Journal of Geophysical Research*, 110, D11208.

Okin, G.S., and T.H. Painter, 2004, Effect of grain size on spectral reflectance of sandy desert surfaces, *Remote Sensing of Environment*, 89(3) pp 272-280.

Okin, G.S., N. M. Mahowald, O.A. Chadwick, P.E. Artaxo, 2004, The impact of desert dust on the biogeochemistry of phosphorus in terrestrial ecosystems, *Global Biogeochemical Cycles*, 18(2), 10.1029/2003GB002145.

Okin, G.S., and M.C. Reheis, 2002, An ENSO predictor of wind erosion and dust emission in the southwest United States: *Geophysical Research Letters.* V 29, no. 9. 10.1029/2001GL014494.

Okin, G.S., W.J. Okin, B. Murray, and D.A. Roberts, 2001, Practical limits on hyperspectral vegetation discrimination in arid and semiarid environments: *Remote Sensing of Environment*, v. 77, 212-225.

Okin, G.S., and D.A. Gillette, 2001, Distribution of vegetation in wind-dominated landscapes: Implications for wind erosion modeling and landscape processes: *Journal of Geophysical Research*, v. 106, 9673-9683.

Okin, G.S., W.H. Schlesinger, and B. Murray, 2001, Degradation of Sandy Arid Shrubland Environments: Observations, process modeling and management implications: *Journal of Arid Environments*, v. 47, 123-144.

Gilbert, J.V., and G.S. Okin, 1995, Laser-induced emission from NFCl radicals isolated in low-temperature argon matrices, *Journal of Physical Chemistry*, v. 99, p. 11365-11369.

Larrabee, J.A., C.M. Alessi, E.T. Asiedu, J.O. Cook, K.R. Hoerning, L.J. Klingler, G.S. Okin, S.G. Santee, and T.L. Volkert, 1997, Magnetic circular dichroism spectroscopy as a probe of geometric and electronic structure of Cobalt(II)- substituted proteins: Ground-state zero-field splitting as a coordination number indicator, *Journal of the American Chemical Society*, v. 119, p. 4182-4196.

Mulinax, R.L., G.S. Okin, and R.D. Coombe, 1995, Gas-Phase synthesis, structure, and dissociation of boron triazide, *Journal of Physical Chemistry*, v. 99, p. 6294-6300.

Refereed Book Chapters

Wang, L., G.S. Okin, S.A. Macko, In Press, Remote sensing of nitrogen and carbon isotopic composition in terrestrial ecosystems in *Isoscapes*, Springer Netherlands.

Okin, G.S., 2002, Toward a Unified View of Biophysical Land Degradation Processes in Arid and Semi-arid Lands, in *Global Desertification: Do Humans Cause Deserts?* J.F. Reynolds & D.M. Stafford Smith, eds. Dahlem University Press, Berlin, pp. 95-109.

Robbins, P.F., N. Abel, H. Jiang, M. Mortimore, M. Mulligan, G.S. Okin, D.M. Stafford Smith, B.L. Turner II, 2002, Desertification at the community scale: sustaining dynamic human-environment systems in *Global Desertification: Do Humans Cause Deserts?* J.F. Reynolds & D.M. Stafford Smith, eds. Dahlem University Press, Berlin, pp. 326-355.

Okin, G.S., B. Murray, and W.H. Schlesinger, 2001, Desertification in an arid shrubland in the southwestern United States: Process modeling and validation, *in Land Degradation: Papers Selected from Contributions to the Sixth meeting of the International Geographical Union's Commission on Land Degradation and Desertification, Perth, Western Australia, 20-28 September 1999*, pp. 53-70, edited by A. Conacher, Kluwer Academic Publishers, Dordrecht.

Unrefereed Book Chapters

Li, J. and G.S. Okin, in press, Carbon and nitrogen dynamics with enhanced wind erosion-Model evaluation and prediction in *Title TBD*, Nova Publishers.

Hartley A.E., N. Barger, J. Belnap, G.S. Okin. 2007. Nutrient Cycling in Dryland Ecosystems. In: Marschner P, Rengel Z (eds) Nutrient Cycling in Terrestrial Ecosystems. Soil Biology Series. Springer Verlag.

Okin, G.S., and D.A. Gillette, 2004, Modelling wind erosion and dust emission on vegetated surfaces *in Spatial Modelling of the Terrestrial Environment* R. Kelly, N. Drake, and S. Barr, eds, John Wiley and Sons, pp. 137-156.

Okin, G.S. and D. A. Roberts, 2004, Remote Sensing in Arid Environments: Challenges and Opportunities, *in Manual of Remote Sensing, Remote Sensing for Natural Resource Management and Environmental Monitoring*, Volume 5, S. Ustin, ed., John Wiley and Sons, New York.

Other Publications

Epstein, H.E., G.S. Okin, J. Li, L.J. Alvarez, 2009 Wind erosion and ecosystem consequences following vegetation removal in a Chihuahuan Desert grassland, *Newsletter of the Global Land Project International Project Office*, n. 5, June 2009, pp. 3 – 4.

INVITED PRESENTATIONS

Okin, G.S., New Perspectives on Desertification, August 31, 2009, Univ. Eduardo Mondlane, Dept. of Forestry Engineering.

Okin, G.S., Connectivity and Ecohydrological Feedbacks in Desertification, AGU Chapman Conference on Examining Ecohydrological Feedbacks of Landscape Change along Elevation Gradients in Semiarid Regions, Sun Valley, Idaho, October 5 – 9, 2009.

Okin, G.S. Aeolian Geomorphology: a lesson in scaling, Civil and Environmental Engineering, UCLA, January 20, 2009.

Okin, G.S. Wind as a geomorphic agent: "Connecting" aeolian studies with hillslope hydrology, January 16, 2009, Smith Lecture Series in the Department of Geological Sciences, University of Michigan, Ann Arbor, MI.

Wang, L. and G.S. Okin, Earth system understanding through the use of satellite products, April 8-10, 2007, Isoscapes 2008, Santa Barbara, CA.

Okin, G.S. Deserts as exemplars of the importance of connectivity in geomorphology, February 4, 2008, UCLA Earth and Space Sciences.

Okin, G.S. Wind erosion in the presence of nonerodible elements, April 12, 2007, Division of Geological and Planetary Sciences, California Institute of Technology.

Okin, G.S., Transport in a "dead world?" The importance of aeolian processes in desertification, March 9, 2007, Geography Department Seminar, Indiana University, Bloomington, IN.

Okin, G.S., Wind erosion in the presence of vegetation, February 9, 2007, Geology Department seminar, University of Texas, El Paso, TX.

Okin, G.S., Wind erosion feedbacks to desertification, February 8, 2007, Earth System seminar, University of Texas, El Paso, TX.

Okin, G.S. Aeolian processes in deserts, UCLA Eos Seminar, November 13, 2007, Los Angeles, CA.

Okin, G.S., Aeolian processes can create islands of fertility, Jornada LTER Research Symposium, July 13, 2006, Las Cruces, NM.

Okin, G.S., J. Li, L Hartman, H.E. Epstein, Impact of Aeolian Processes on Soil Surface Resource Distribution, AAG Annual Meeting, 2006.

Mahowald, N., D. Muhs, S. Levis, M. Yoshioka, P. Rasch, C. Zender, G. Okin, and T. Painter, Deposition changes in the past and the future, AGU Fall Meeting, 2005.

Mladenov, N., G. S. Okin, D. Cassel, and K.K. Caylor, Geostatistical analyses reveal nutrient-vegetation relationships in savanna soils, AGU Fall Meeting, 2005.

Hartman, L., G.S. Okin, H.E. Epstein, J. Li, Interactions among wind erosion, vegetation, and dust flux in the Jornada Experimental Range, Jornada Research Symposium, July 14, 2005, Las Cruces, NM.

Okin, G.S., T.H. Painter, 2005, Grain size effects on spectral reflectance of desert soil surfaces, Desert Trafficability Workshop, Winthrop, Washington, January 21-23.

Okin, G.S., 2004, Deserts: The Cradle of Civilization, University of Virginia, Department of Environmental Sciences Undergraduate Seminar.

Okin, G.S., 2004, The role of spatial heterogeneity in modeling wind erosion, Boulder, CO.

Okin, G.S., 2004, The role of wind erosion in ecosystem change, Jornada LTER Research Symposium, Las Cruces, NM.

Okin, G.S., 2004, Blowing in the Wind, Harvard University Department of Earth and Planetary Sciences.

Okin, G.S., 2004, Multiscale Controls on Wind Erosion and Dust Emission, University of Arizona Department of Soil, Water, and Environmental Sciences.

Okin, G.S., 2004, Multiscale Controls on Wind Erosion and Dust Emission, University of California, Santa Barbara, Department of Geography.

Okin, G.S., 2004, Spatially explicit stochastic modeling of wind erosion and dust emission. Geological Society of America, Washington, D.C.

Okin, G. S., N. Mahowald, O.A. Chadwick, P. Artaxo, 2003. The Influence of Desert Dust on the Biogeochemistry of Phosphorus in Terrestrial Ecosystems, The Soil Science Society of America Annual Meeting, Denver, CO.

Okin, G. S., 2002, Land use, land cover change, and desert dust, 2nd IANABIS workshop, San Luis Potosi, Mexico.

OTHER PROFESSIONAL PRESENTATIONS (Incomplete List)

Ribeiro, N., G.S. Okin, H.H. Shugart, R.J. Swap, the influence of rainfall, vegetation, elephants and people on fire frequency of miombo woodlands, northern Mozambique, IGARSS 2009, July 13-17, 2009, Cape Town, South Africa

Ravi S., P. D'Odorico, S.L. Collins, C. White, G.S. Okin, S. Macko, and L. Wang, Aeolian processes at the plant-interspace scale: Implications for patch dynamics, Ecological Society of America Annual Meeting, Milwaukee, WI, August 3 – 8, 2008.

Hewins, D.B., H.L. Throop, S.R. Archer, G.S. Okin, Soil-litter mixing enhances decomposition rates in a Chihuahuan Desert grassland Ecological Society of America Annual Meeting, Milwaukee, WI, August 3 – 8, 2008.

Herrick, J.E., D.P.C. Peters, N.K. Hansen, J.C. Ritchie, H.C. Monger and G.S. Okin, 2008, Application of soil physical models to predict soil deposition effects on plant establishment, Ecological Society of America Annual Meeting, Milwaukee, WI, August 3 – 8, 2008.

Wainwright, J. A.J. Parsons, J. Stewart, G.S. Okin, L. Turnbull, R.E. Brazier, Ecogeomorphology and Scale: Desertification due to Woody Shrub Encroachment in the US Southwest, 7th International Conference on Geomorphology (IAG), Melbourne, Australia, July 6 – 11, 2009.

Ravi, S., P. D'Odorico, L. Wang, S.L. Collins, C.S. White, G.S. Okin, 2008, Resource homogenization in degraded arid landscapes induced by fire-erosion interactions, American Geophysical Union, Fall Meeting.

Vest, K.R., A.J. Elmore, G.S. Okin, 2008, Wind erosion and vegetation structure in groundwater affected plant communities, American Geophysical Union, Fall Meeting.

Ballantine, J.C., N.M. Mahowald, G.S. Okin, 2008, The influence of source landforms, antecedent precipititation, and windspeed on dust events in North Africa, American Geophysical Union, Fall Meeting.

Shreve, C.M., G.S. Okin, 2008, Spatiotemporal dynamics of snow cover in the western Tibetan Plateau using a MODIS derived fractional snow cover index, American Geophysical Union, Fall Meeting.

Ribeiro, N.S., G.S. Okin, H.H. Shugart, and R.J. Swap, 2008, The influence of rainfall, vegetation, elephants and people on fire frequency of Miombo woodlands, northern Mozambique, American Geophysical Union, Fall Meeting.

Okin, G.S., A.J. Parsons, J. Wainwright, J.E. Herrick, B.T. Bestelmeyer, D.P.C. Peters, E.L. Fredrickson, 2008, Do changes in connectivity explain desertification?, American Geophysical Union, Fall Meeting.

Stewart, J., J. Wainwright, A.J. Parsons, G.S. Okin, B.T. Bestelmeyer, E.L. Fredrickson, W.H. Schlesinger, 2008, Dynamics and resilience of desert ecosystems under changing climate, American Geophysical Union, Fall Meeting.

Mahowald, N.M. et al. Human perturbation to atmospheric phosphorus, American Geophysical Union, Fall Meeting.

Herrick, J.E., D.P.C. Peters, B.T. Bestelmeyer, G.S. Okin, N.K. Hansen and K.M. Havstad, Predicting soil erosion and deposition effects on plant establishment: a key to increasing restoration success, Joint VIII IRC / XXI IGC Congress, Hohhot, Inner Mongolia, China 29 June 2008.

D'Odorico, P., G.S. Okin, Ecohydrological feedbacks and ecosystem stability at the desert margins, International workshop on environmental changes and sustainable development in arid and semiarid regions, Alashan Left Banner (Bayinhaote) Inner Mongolia, China, September 10-17, 2007.

Okin, G.S., The key role of landscape connectivity in desertification, International workshop on

environmental changes and sustainable development in arid and semiarid regions, Alashan Left Banner (Bayinhaote) Inner Mongolia, China, September 10-17, 2007.

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TEACHING EXPERIENCE

University of California, Los Angeles

Earth's Physical Environment (GEOG 1)	Fall, 2006-8
Soils and Environment (GEOG/EEB/ENVIRO 127)	Winter, 2007-9
Modeling the Environment (GEOG 166)	Spring, 2008-9
Remote Sensing of Environment (GEOG 269)	Winter, 2008

University of Virginia

Physical Geology	Spring, 2003 & 2004
Introduction to Remote Sensing	Fall, 2003 & 2004
Advanced Remote Sensing	Spring, 2004 & 2005
Remote Sensing	January, 2005
Two-week short course on the physics and techniques of remote sensing	
Soils and Geomorphology	Spring, 2005

California Institute of Technology

Teaching Assistant (Earth as a Planet, Mineral Spectroscopy, Global Biogeochemical Cycles, Radioisotope Geochemistry, Terrestrial Surface Systems)

STUDENTS

Committee Chair: Kebonyethata Dintwe (M.A., in progress), Marie Javdani (Ph.D., in progress), Patrick Kahn (Ph.D., in progress), Junran Li (Ph.D., 2008), Ian McGlynn (M.S., 2006), Cheney Shreve (UVA, Ph.D., i2009), David Rachal (NMSU Plant and Environmental Sciences, Ph.D., in progress)

Committee Member: Anne Priest (UVA M.S., 2005), James Eaton (UVA M.S., 2004), Lucy Diekmann (UVA M.S., 2003), Sujith Ravi (UVA M.S., 2004; Ph.D. 2008), Natasha Ribeiro (UVA Ph.D., 2007), Mike O'Connell (UVA Ph.D., 2009), Lyndon Estes (UVA Ph.D, 2008), Lorelei Alvarez (UVA Ph.D., in progress), Will Hobbs (UCLA Geography Ph.D. 2009), Jelena Tomic (UCLA ESS, Ph.D. in progress), Travis Brooks (UCLA EEB, Ph.D. in progress), Paul Levine (UCLA Geography, Ph.D. in progress), Vena Chu (UCLA Geography, M.S., 2009), Dayna Quick (UCSB, Geography, Ph.D., in progress), Keith Gaddis (UCLA EEB, Ph.D., In Progress)

Undergraduate Thesis Students: Allen Smith (UVA 2003-4), David Cassel (UVA 2005-6)

SERVICE ACTIVITIES

University of California, Los Angeles	
Geography Department	
Graduate Affairs Committee	2006-present
University Service	
Reviewer, ISR Summer Fellowships	
Member, Faculty advisory committee, Stunt Ranch Santa Monica Reserve	2007-present
Member, Environmental Science Major Oversight Committee	2008-present
Member, Faculty advisory committee, ISR	2009-present
Member, Center for Tropical Research	2008-present
Panelist, "Negotiation skills for academic careers", UCLA Career Center, March 17	2007
Panelist, "Mastering the academic interview", UCLA Career Center, October 26	2006
University of Virginia, Department of Environmental Sciences	
Departmental Committees	
Graduate admissions	2002-2005
Distinguished Majors Program	2002-2004
Undergraduate academic requirements committee (UGARC)	2002-2005
Computing	2003-2005
Graduate academic requirements committee (GARC)	2004-2005
University Service	
Undergraduate Academic Advisor	2002-2004
Faculty Associate, Center for South Asian Studies	2002-2005
Faculty Associate, Center for East Asian Studies	2002-2005
Member, Friends of the LGBT Resource Center Board	2005-2006
Member, LGBT Resource Center Advisory Board	2005-2006
Service to the Profession	
Member, UN/GESAMP Working Group (38) on The Atmospheric Input of Chemicals to the Ocean	2008-present
Co-convener special session on "Dynamics and interactions of belowground carbon pools in dryland ecosystems", AGU Joint Assembly, Acapulco, Mexico	2007
Co-convener special session on "Soil-Water-Nutrient Interactions With Savanna Vegetation", AGU Fall Meeting	2005
Co-convener special session on "Intracontinental Mass and Energy Transport Between Alpine and Desert Ecosystems", AGU Fall Meeting	2005

Co-convener special session on "Ecosystem Effects of Dust Deposition", AGU Fall Meeting 2003
Task force on wind erosion, International Geographic Union, Commission on Land Degradation 1997-2004
Member, Geological Society of America 2001-present
Member, American Geophysical Union 1997-present
Member, American Association of Geographers 2005-present
Member, Soil Science Society of America 2006-present

SYNERGISTIC ACTIVITIES

Development of the UCLA IMAGE laboratory 2009-present
An innovative multidisciplinary laboratory for research and teaching
UCLA Environmental Science Major Oversight Committee 2008-present
Participate in curricular decisions for this new multi-displinary major at UCLA
Faculty advisory committee, Stunt Ranch Santa Monica Reserve 2007-present
Participate in research, training, and educational decisionmaking for this UC Reserve
Development of Relative Spectral Mixture Analysis 2007-present
A new MODIS-based phenological remote sensing technique
Panelist, UCLA Career Center 2006-2007
"Negotiation skills for academic careers", "Mastering the academic interview"

ATTACHMENT D
HENDRIX COMMENTS

July 8, 2010

Allison Shaffer, Project Manager
Palm Springs South Coast Field Office
Bureau of Land Management
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Palm Springs, CA 92262
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Re: Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

I have been working for the California Unions for Reliable Energy ("CURE") as a consultant on the Application for Certification ("AFC") for the Genesis Solar Energy Project ("Project" or "GSEP") since the data adequacy phase. I have reviewed numerous documents and have conducted my own investigations and analyses regarding the Project's potential impacts on water resources.

My testimony is based on the activities described above and the knowledge and experience I have acquired during more than 24 years of working on hydrogeology and engineering geology issues. A summary of my education and experience is attached to this testimony as Attachment 1.

This testimony provides an analysis of hydrogeologic conditions and potentially significant unmitigated impacts associated with the Project. Opinions expressed herein result from review of the technical documents listed in the references section below, including but not limited to the AFC, several groundwater resource investigation reports prepared by consultants to the Project applicant, Genesis Solar, LLC ("Applicant"), the Staff Assessment and Draft Environmental Impact Statement ("SA/DEIS"), and the Revised Staff Assessment ("Revised SA") for the Project. We also describe additional analyses that are needed to address the impacts associated with the Project.

With the information reviewed to date, I have determined that the Project would result in the following: (1) potentially significant unmitigated impacts to CVGB water balance; (2) potentially significant unmitigated impacts to groundwater supply for both existing and other proposed projects within the CVGB; and (3) significant unmitigated impacts to groundwater supply within the Palo Verde Mesa Groundwater Basin (PVMGB) and adjudicated Colorado River. My

determinations are based on the fact that the technical analyses used to evaluate significant impacts in the Revised SA: (1) are insufficient to determine the adequacy of existing groundwater supply to meet proposed Project needs; (2) rely on an existing groundwater well data set with several salient gaps, the uncertainties of which have not been quantified properly with respect to long-term Project water demands and available supply; (3) do not accurately account for extractions of groundwater in storage from the adjacent PVMGB or the Colorado River; (4) erroneously assume that *total groundwater in storage* within the CVGB may be considered accessible to both the proposed Project and other foreseeable projects, without proper consideration of long-term *sustainability* of the water supply; (5) do not account for the uncertainty in future potential CVGB recharge and Colorado River water "accounting surface" levels resulting from prolonged drought and/or climate changes; and (6) do not fully anticipate pending changes in the acquisition process for water entitlements within the fully-appropriated Colorado River.

I. STATEMENT

A. The Project Would Result in Potentially Significant Unmitigated Impacts to CVGB Balance

The Revised SA states that the Project would not significantly impact basin balance in the CVGB under existing conditions because Project pumping plus other existing basin outflows would not exceed net average recharge (inflows) to the basin.[1] According to the current water budget of the CVGB provided by the Applicant, the CVGB is estimated to have a net available water supply of approximately 2,608 acre-feet per year ("AFY").[2] The Project proposes to pump 1,605 AFY during operation.[3] Thus, Staff concludes that because there will be a net positive budget balance of 1,003 AFY with full Project operation, Project pumping will not cause an overdraft in the CVGB.[4] However, Staff's analysis fails to account for: (1) impacts to the CVGB water budget from uncertainties in the number and water demands of other proposed projects; (2) uncertainties regarding outflow from CVGB to PVMGB; and (3) uncertainties associated with the Applicant's groundwater investigations and flow model. Furthermore, the Revised SA's proposed mitigation for potential impacts to the CVGB balance is inadequate.

First, the 2,608 AFY figure includes groundwater pumping, but ***excludes cumulative impacts*** from Project pumping and pumping by other proposed local solar power plant projects, including Chuckwalla Solar I, Eagle Mountain Soleil, Desert Lily Soleil, Desert Sunlight Solar Farm, Eagle Mountain Pump Storage, Mule Mountain Solar Project, Mule Mountain Soleil, and Solar Millennium Palen

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[1] Revised SA, p. C.9-46.
[2] Id., p. C.9-30, Soil & Water Table 8.
[3] Id., p. C.9-7, Soil & Water Table 1.
[4] Id., p. C.9-47.

Solar Project.[5] Thus, in relying on the 2,608 AFY figure, Staff overestimated the CVGB's net available water supply.

The Revised SA states that because the estimated "total recoverable groundwater in storage" in the CVGB will be 15,000,000 AF over the construction and operation period of the Project, the Project's contribution to the cumulative impact to basin balance is less than significant.[6] However, total groundwater in storage is not a meaningful baseline for effective groundwater management; rather, the conventional standard for basin management is the *perennial yield* or *operational safe yield* of the basin, which is defined as that amount of groundwater outflow (extraction) which can be *sustained over time* without creating significant detrimental impacts, such as basin overdraft.[7] This concept of sustainability goes beyond the simple arithmetic of the water budget (inflow versus outflow), and must account for the effects of potential reduction in "expected" basin recharge during long-term droughts and climate change, and/or the ability of the basin to *naturally recharge* over time as groundwater exceeding "average" budget recharge is repeatedly extracted over a multiple-year period.[8]

Furthermore, no consideration for potential long-term drought or climate change effects have been presented by the Applicant, nor requested by Staff. Because of such uncertainties, and because large alluvial basins such as the CVGB and PVMGB do not "instantaneously recover" from such conditions, the net result is the "mining" of groundwater, which results in negative impacts such as those outlined by Staff in the Revised SA[9] (e.g., undesirable lowering of water levels in other CVGB basin wells) and the removal of groundwater in storage from the PVMGB and the Colorado River.[10] The proposed use of the estimated 15,000,000 AF of CVGB *total storage* as a basin "management bright-line" or basis for significance levels is thus erroneous; the "total basin inflow" of 13,719 AFY is the key operative quantity for basin management decisions, and is likely to more closely approximate the true *perennial yield* value for the CVGB.

Second, 2,608 AFY assumes that outflow/underflow from CVGB to PVMGB is 400 AFY.[11] However, in its response to CURE's data requests, the Applicant presented a revised estimate for the outflow from CVGB to PVMGB of 988 AFY[12], more than double its earlier estimate of 400 AFY. Given the greater 988 AFY outflow, the available CVGB water budget must necessarily be readjusted downward to 2,020 AFY. Consequently, with Project operation there is a relatively

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[5] Tetra Tech EC and WorleyParsons, 2009, p. 10, Table 2.
[6] Revised SA, p. C.9-85.
[7] Bredehoeft,2002; Devlin and Sophocleous, 2005.
[8] Alley and Leake, 2004; Kresic, 2008.
[9] Revised SA, p. C.9-58.
[10] Anderson and Woosley, 2005.
[11] Revised SA, p. C.9-47.
[12] Genesis Solar, LLC's Data Responses to CURE's Data Requests Set 2 (1-9), Item 6.

small "margin of error" for water supply management of only 348 AFY. Given the poor water well control and water level data for the CVGB basin, such a small error-margin is unacceptable, particularly once other proposed pumpers (see above) are added into the equation. The small margin of error in the available water budget and yield poses serious concerns that the proposed Project groundwater pumping may, in combination with existing pumpers and other proposed projects, result in an overdraft situation in the CVGB.

Furthermore, no apparent effort was made by the Applicant to evaluate future potential droughts in the greater Colorado River watershed (or continuation of the existing drought, which has resulted in a 110-foot water level decline in Lake Mead, according to the U.S. Bureau of Reclamation)[13] upon Colorado River flows or water levels, and resultant impacts on water levels and replenishment to the PVMGB. Such fluctuations may significantly alter (increase) the outflow from CVGB into PVMGB, and negatively impact available CVGB water budget for the proposed Project.

Third, the Applicant's groundwater studies and resultant conclusions are based upon large uncertainties. A primary source of uncertainty originates from the dearth of adequate existing water well data essential to developing and calibrating a reliable conceptual groundwater flow model and numerical model for the groundwater basins, including both the limited well locations, type of well construction (e.g., wells shallower than the proposed Project pumping depths and flow model depths; wells which screen across multiple aquifers and confining units; wells for which no screen depth information is available) and absence of available information regarding historical water level measurements in existing wells. Each of these "data gaps" introduces significant uncertainty to a numerical flow model.[14]

For example, both the Applicant and Staff identify 54 wells within the Project well database,[15] but only 16 of these wells screen at depths within the proposed Project groundwater extractions depths (> 800 feet below ground surface).[16] Furthermore, many of these wells have been abandoned, according to the California Department of Water Resources and the National Well Information System, and are thus not available for the long-term monitoring program recommended by Staff as a mitigation measure.[17]

In addition, in its response to Staff's Data Requests Set 1A, number 149, the Applicant provided Figure WR-DR149b which indicates only two nearby wells (#9 and #15) with water level data collected during the time period of greatest interest

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[13] US Dept. of Interior, USBR web site, 2010.
[14] Zheng and Bennett, 2002.
[15] Revised SA, p. c.9-40; Soil & Water Table 11.
[16] Id., p. C.9-5.
[17] Id., p. C.9-100, Soil & Water-2.

to evaluating groundwater response to proposed Project pumping (i.e., 1988 to present, the period when local prison expansion and pumping increases occurred). This is a very limited data set of historical water levels from which to determine how the CVGB will respond to Project pumping. The Applicant acknowledged that limited well-construction details (screened intervals) are available for these wells,[18] and that the wells apparently screen depths shallower than the depth intervals proposed for Project groundwater pumping (i.e., 800 – 1800 foot depth).[19] Therefore, water level trends in these nearest wells are of limited use in evaluating long-term groundwater response to pumping in the CVGB.

The limitations of the well data set make it unfeasible to calibrate the Applicant's existing flow model to water levels (heads), which is a conventional recommended procedure for proper flow model development and calibration.[20] Consequently, the Applicant has presented an initial model which is calibrated only to water budget and groundwater *flux*, rather than calibrated to heads. *The Applicant's own groundwater consultant has acknowledged this fact, and the limitations of its model.*[21]

Because of the numerous uncertainties associated with refining the flow model for the CVGB, the Revised SA proposes to mitigate potential impacts to the basin with a groundwater monitoring plan and a water supply plan.[22] However, the proposed plan is inadequate for several reasons. First, Staff recommends use of only *existing* groundwater wells within the CVGB for the monitoring program. However, there are no existing monitoring wells within three miles of the Project location, few existing wells screen the depths below 800 feet where proposed pumping is to occur, and existing wells largely screen across multiple aquifers and confining units as opposed to across discrete zones where Project pumping is to occur. Each of these factors diminishes the intended use and effectiveness of the *existing* wells within the Staff-recommended monitoring network ;[23] Second, there are no proposed monitoring wells within the PVMGB which eliminates the ability for "early-warning" detection and mitigation of potential overdraft in the PVMGB and removal of Colorado River waters during Project pumping . Third, there are *NO* wells located within or in reasonable proximity to the critical basin boundary *between* the CVGB and PVMGB. [24] The absence of monitoring wells directly along the boundary minimizes the ability to verify the speculative flow conditions across

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[18] See Applicant Response to CURE Water Resources Data Requests 1 -9, Item #2, April 2010.
[19] Worley-Parsons, 2010b.
[20] ASTM, 1993; Hill, 1998; Zheng and Bennett, 2002.

[21]Genesis Solar, LLC's Data Responses to CURE's Data Requests Set 2 (1-9), Items 2 and 3.

[22] Revised SA, pp. C.9-100-105.
[23] Id., p. c.9-40, Soil & Water Table 11.
[24] Worley-Parsons, 2010a, Figs. 6 and 10; Galati & Blek Responses to CURE data Requests 1 – 9, 2010a Fig. CDR 7-1.

this important boundary, and likewise decreases the ability for "early warning" detection of adverse extractions from the PVMGB and Colorado River, to which the Applicant is not legally entitled.

B. The Project Would Result in Potentially Significant Impacts to Groundwater Supply for Both Existing Uses and Proposed Projects in the CVGB

Results of pumping tests in CVGB existing wells, coupled with results of the existing Applicant groundwater flow model indicate that other existing and proposed groundwater pumpers are within the physical capture zone limits of the proposed Project extraction wells. Thus, the proposed Project would potentially create a significant impact on local and regional water resources in that it will have negative impact upon water levels within wells operated by other existing groundwater pumpers and projects including State prisons pumping south of the proposed Project in the Eastern CVGB, agricultural pumping in the PVMGB to the east, and the contiguous water supplies of the Colorado River to the east, as well as several *proposed* projects with groundwater extractions in these basins (Chuckwalla Solar I, Eagle Mountain Soleil, Desert Lily Soleil, Desert Sunlight Solar Farm, Eagle Mountain Pump Storage, Mule Mountain Solar Project, Mule Mountain Soleil, and Solar Millennium Palen Project, Solar Millennium Blythe Project).[25]

The groundwater monitoring plan and water supply plan recommended by Staff to mitigate potentially significant impacts to the groundwater supply in the CVGB[26]are inadequate for several reasons. First, Staff recommends use of only existing groundwater wells within the CVGB for the monitoring program. However, there are no existing monitoring wells within three miles of the Project location, few existing wells screen the depths below 800 feet where proposed pumping is to occur, and existing wells largely screen across multiple aquifers and confining units as opposed to across discrete zones where Project pumping is to occur;[27] Each of these factors diminishes the intended use and effectiveness of the *existing wells* within the Staff-recommended monitoring network. Second, there are no proposed monitoring wells within the PVMGB. As a result, there is no ability for "early-warning" detection and mitigation of potential overdraft in the PVMGB and removal of Colorado River waters during Project pumping. Third, there are *NO* wells located within or in reasonable proximity to the critical basin boundary *between* the CVGB and PVMGB. The absence of monitoring wells directly along the boundary minimizes the ability to verify the speculative flow conditions across this important boundary, and likewise decreases the ability for "early warning" detection of adverse extractions from the PVMGB and Colorado River, to which the Applicant is not legally entitled.

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[25] Tetra Tech EC and WorleyParsons, 2009, p. 10, Table 2
[26] Revised SA, pp. C.9-100-105.
[27] Id., p. c.9-40, Soil & Water Table 11.

C. The Project Would Result in Significant Unmitigated Impacts to the PVMGB and Colorado River

The Revised SA correctly concludes that the Project will result in significant impacts to the PVMGB and the Colorado River. However, an adequate understanding of the hydraulic continuity between the CVGB and the PVMGB is necessary to adequately analyze the extent of the Project's significant impacts to the PVMGB and the adjudicated Colorado River. To better understand this connection, in its Data Requests Set Two, CURE requested that the Applicant provide an evaluation of PVMGB water demand and water level response using both historic well pumping (production) data and water levels from existing PVMGB wells.[28] The Applicant did not provide a conventional well-production analysis as requested; rather, it provided only well hydrograph (water levels vs. time) data.[29] In the absence of a comprehensive comparison between groundwater pumping versus water level data in the PVMGB, the potential increase in outflow from the CVGB to the PVMGB as a result of future increased pumping in the PVMGB cannot meaningfully be assessed. As such, the potential reduction in available CVGB water budget for the proposed Genesis (and other) solar projects, and the removal of water from the Colorado River to replace future groundwater extracted from storage via PVMGB pumping, cannot be evaluated reliably.

Although it is unlikely that 100% of the pumped Project groundwater will result in extraction from the Colorado River directly, the existing data uncertainties (discussed above) yield the possibility that a significant portion of the groundwater extracted by the Genesis Project will ultimately flow from the Colorado River. The existing numerical groundwater flow model developed by the Applicant[30] is incapable of simulating such flows or resolving the uncertainties, as discussed above.

Condition of Certification Soil & Water-19 allows the Applicant to develop a revised flow model to estimate the maximum predicted decrease in underflow from the CVGB to the PVMGB and Colorado River.[31] However, the same uncertainties found in the existing Applicant flow model will persist in this recommended revised flow model approach. It is likely that the same large (20 – 25%) residuals (simulated vs. observed water level and flux values) obtained within the Applicant's initial model calibration effort will result from this recommended revised model effort. Such large residuals are typically unacceptable for flow models.[32]

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[28]-CURE Data Requests Set 2 (1 -9).
[29] See Applicant's Response to CURE Water Resources Data Requests 1 – 9, April 2010.
[30] Worley Parsons, January 2010a.
[31] Revised SA, p. C.9-142.
[32] ASTM, 1993; Hill, 1998; Zheng and Bennett, 2002.

The Revised SA also recommends replacement of extracted Colorado River waters by the Applicant as mitigation for significant impacts to the Colorado River. However, given that: (a) the Applicant is not an adjudicated party to the existing Colorado River Quantification Settlement Agreement (QSA)[33] and has no existing legal entitlement to this water; (b) the Colorado River is fully appropriated; (c) the current multi-year drought condition affecting the lower Colorado River would restrict the local approval of replacement water transfers between adjudicated QSA parties (e.g., City of Needles) and the Applicant; and (d) existing uncertainties in how the USBR ultimately intends to implement management of the river "accounting surface", local replacement water entitlements is not a feasible means to mitigate Project impacts to the Colorado River. The Applicant has not provided a plan for attempting to secure water rights transfers from pumpers within the PVMGB (either municipal or agricultural), nor has the Applicant provided an assessment of the likelihood of availability of such transfers. Thus, impacts to the Colorado River remain significant and unmitigated.

D. Supplemental Efforts Necessary to Adequately Analyze and Mitigate Impacts to Water Resources

My evaluation has resulted in recommendation for the following supplemental analyses by the Applicant to adequately analyze and mitigate the Project's impacts to water resources:

(1) Serious re-consideration of the design and implementation of a dry-cooling system for the proposed solar plant, to reduce consumptive groundwater use;

(2) Analysis of the potential impacts of prolonged drought conditions and climate change upon water levels in the CVGB, Colorado River and PVMGB during the 33-year proposed Project duration, and thus upon predicted groundwater flows across the boundary between the CVGB – PVMGB boundary, as well as the reasonableness for replacement water entitlements or transfers available to Genesis as part of impacts mitigation;

(3) The revision of the existing 3D Genesis numerical groundwater flow model to adequately simulate flows from groundwater in storage in the PVMGB and potential flows directly from the Colorado River in response to Project pumping. The revised model must be able to discriminate extractions of groundwater from storage in the PVMGB versus flows out of the Colorado River, and must be able

[33] *Arizona vs. California*, 2006.

to reasonably resolve the existing uncertainties in aquifer configuration, heads and flows across the CVGB-PVMGB boundary;[34] and

(4) Installation of groundwater monitoring well(s) along the CVGB-PVMGB boundary where limited well control exists presently, to serve as "sentry wells" against future excess flows out of the PVMGB and Colorado River due to long-term Project pumping. Wells should screen vertical intervals which match the same hydrostratigraphic intervals designated for Project well pumping. Dedicated water level transducers and a real-time recording interface, such as a telemetric system, is recommended, to provide maximum response time to potential future excess groundwater flux into the CVGB.

Sincerely,

Eric D. Hendrix

Eric D. Hendrix BH

[34] *See* Applicant's Response to CURE Water Resources Data Requests 1 -9, Item 2, April 2010.

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ATTACHMENT 1

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RESUME OF ERIC D. HENDRIX

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Education

Master of Science, Geology
University of California, Los Angeles

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California State University, Long Beach

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Certified Hydrogeologist, California, No. 431
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Registered Professional Geologist, California, No. 4899
Registered Geologist, Arizona, No. 26977
Registered Environmental Assessor, California, No. 2495
California Community Colleges Instructor Credential

Professional Responsibilities

As Vice President of Geology for Mission Geoscience, Mr. Hendrix:

- Manages technical operations & business development for all water resources development & remediation, hydrology and seismic risk evaluation services
- Oversees Corporate Engineering Geologic & Hydrogeologic Technical Quality Control program.
- Coordinates litigation support services for water resources/water rights matters, environmental engineering standard-of-care, and environmental remediation, compliance ad toxic tort projects (CERCLA contribution, RCRA, SDWA, CWA)

Professional History

- Senior Hydrogeologist, Applied Environmental Services, Inc., Laguna Hills, California.
- Senior Engineering Geologist, Zeiser/Kling Consultants Inc., Costa Mesa, California.
- Engineering Geologist, Leighton & Associates, Inc., Irvine, California
- Research Assistant, Precambrian Paleobiology Research Group, UCLA

Experience

Mr. Hendrix has over 25 years of complex hydrologic and hydrogeologic project experience, involving surface and ground water assessment, development, management, remediation, protection & litigation, including the following:

Remediation management for complex dissolved and separate-phase (NAPL) hydrocarbon groundwater plumes in multiple potable aquifers, large petroleum refinery, Carson, CA

Remediation management for complex dissolved and separate-phase (NAPL) hydrocarbon groundwater plumes in potable aquifer, large petroleum refinery, Paramount, CA

Remediation management of heavy-distillate NAPL contamination of complex faulted aquifer, petroleum refinery, Signal Hill, CA

Remediation of chlorinated solvent plume in potable aquifer, large aerospace manufacturing facility, Torrance, CA

Remediation of chlorinated solvent plume in potable aquifer, large aerospace manufacturing facility, Fullerton, CA

Aquifer testing & remediation of chlorinated solvent plume in Superfund NPL site, City of Industry, San Gabriel Valley Groundwater Basin

Aquifer characterization and fate & transport investigation, complex groundwater contamination site involving multiple chlorinated solvent sources, for litigation support, Santa Barbara, CA

Aquifer characterization, testing & assessment of potential contaminant plume capture by production wells, for litigation support, former Kaiser Steel Mill, Ontario, CA

Assessment of groundwater production sustainability for proposed large solar energy facility, Pleasant Valley Groundwater basin, Fresno County, CA (for State Energy Commission CEQA process)

CEQA / SB 610 water supply analysis for large commercial development project, Sacramento County, CA

CEQA Flood Hydrology & Coastal Erosion Investigation, City of Dana Point General Plan

Storm water runoff and pollutant loading study for harbor expansion, City of Dana Point

Surface flooding risk analysis for high-pressure MWD water pipelines, Rancho Santa Fe, CA

Surface water hydrology & pollutant loading study associated with large planned complex development, Irvine Lake, CA

Storm water runoff study related to wetlands development and CWA Section 404 streambed alteration, San Juan Capistrano

Groundwater model development to assess impacts of sewage discharge on production wells, Wrightwood, CA

Groundwater model development to assess impacts of hazardous waste landfill leachate on production well quality, Colton, CA

Groundwater model development to evaluate potential off-site migration of dissolved chlorinated solvent plume at large aerospace manufacturing facility, Torrance, CA

Seepage and groundwater source investigation for large landslide impacting hillside residential area, for litigation support, Anaheim, CA

Hydrologic investigation to determine sources of water causing hydrocollapse of fill slopes, for litigation support, Covina, CA

Watershed runoff and groundwater recharge study for new school construction, Cajon Valley, CA

Evaluation of seepage impacts to landslide occurrence, various sites throughout Orange, Los Angeles, Riverside and San Diego County

Surface and Subsurface Hydrogeologic Investigation & Production Well Feasibility Study, Wilder Ranch EIR & Specific Plan, Santa Cruz County, CA

Natural spring water supply feasibility investigations, La Jolla Indian Reservation, San Diego County, CA

Groundwater development investigations, Warner Springs and Lake Henshaw Basin, San Diego County, CA

Operational Yield Investigation and Draft AB 3030 Management Plan, Charnock Groundwater Basin, Los Angeles County, CA

Sentney Wellfield Development & Safe Yield Evaluation, Central Groundwater Basin, Los Angeles County, CA

Wellhead Protection, Aquifer Testing and Regional Contaminant Investigation, Concerto Wellfield, Forebay of Orange County Groundwater Basin

Wellhead Protection Investigation and Aquifer Testing, Claremont Groundwater Basin, Los Angeles County

Regional Groundwater Basin Evaluation, Groundwater Model Development and Wellhead Protection Study, USEPA Santa Monica Regional MTBE Contamination Project

Associations Member of Executive Committee,
Society of Sedimentary Geology (SEPM), Pacific Section
National Groundwater Association/Association of Groundwater Scientists and Engineers (NGWA/AGWSE)
California Groundwater Resources Association (GRA)
Association of California Water Agencies (ACWA)
Association of Environmental & Engineering Geologists
American Society of Civil Engineers (ASCE)
American Association of Petroleum Geologists
(Division of Environmental Geosciences/Charter Member)
Geological Society of America *(Hydrogeology, Engineering Geology, Sedimentary Geology and Quaternary Geology Divisions)*

Awards & Honors

Dibblee Geological Foundation, Honorary Map Dedication DF-384, Rosamond & Rogers Lake Quadrangles, 2008

Sigma Xi Graduate Research Fellowship, UCLA, 1984-1986

Invited Speaker, Geological Society of America Penrose Conference, 1986, Ventura, CA, Miocene Tectonic Reconstruction of California

Invited Speaker, 2001 Geological Society of America Cordilleran Section Field Trip, Central Transverse Ranges & San Andreas Fault

Publications

(separate list available upon request)

ATTACHMENT E
MARCUS COMMENTS

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Re: CURE's Comments Concerning Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8)

Dear Ms. Shaffer:

Attached is the testimony of Mr. David Marcus to the California Energy Commission, which he has approved for submission to the BLM as well.

Sincerely,

Rachael E. Koss

REK:bh

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printed on recycled paper

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:	
The Application for Certification for the GENESIS SOLAR ENERGY PROJECT	Docket No. 09-AFC-8

TESTIMONY OF DAVID MARCUS ON BEHALF OF THE CALIFORNIA UNIONS FOR RELIABLE ENERGY ON SOIL AND WATER RESOURCES FOR THE GENESIS SOLAR ENERGY PROJECT

June 18, 2010

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FOR RELIABLE ENERGY

I. INTRODUCTION

I have been working for the California Unions for Reliable Energy ("CURE") as a consultant on the Application for Certification ("AFC") for the Genesis Solar Energy Project ("Genesis" or "GSEP") since the data adequacy phase. I have reviewed documents and have conducted my own analysis regarding the use of dry cooling for the Project.

My testimony is based on the activities described above and the knowledge and experience I have acquired during more than 25 years of working as an energy consultant, including a dozen years working on CEC siting cases on behalf of CURE. A summary of my education and experience is attached to this testimony as Exhibit 1.

II. WATER USE AND THE ECONOMIC VIABILITY OF DRY COOLING (SA, pp. B.2-17 to B.2-18)

The Genesis project is being developed by a subsidiary of NextEra Energy Resources, LLC, just like the Beacon Solar Energy Project which is also in licensing at the CEC.[1] Both projects are proposed to have a maximum output of 250 Mw.[2] Both propose to use wet cooling. Both have had analyses prepared for them by Worley Parsons which look at the feasibility and economics of using dry cooling instead of wet cooling.[3] The analysis below is based on the two Worley Parsons studies prepared for the Genesis and Beacon applicants, and also relies upon supplemental confidential analysis prepared by the Beacon applicant and the CEC staff, and reported in the alternatives chapter of the Beacon FSA.

A. Economics of changing to dry cooling without changing the size of the solar field

[1] For the Beacon developer, see p. 1 of http://docs.google.com/viewer?a=v&q=cache:_Gf3alezgoAJ:www.energy.ca.gov/sitingcases/beacon/DESCRIPTION.PDF+%22Beacon+Solar,+LLC%22&hl=en&gl=us&pid=bl&srcid=ADGEESjqVmGRZTE1tmB5c0vhzAGuxyrgKsk8sSPgYRwjPo3mmXigOphM5c37XJ9ijyg4M7XGeSahqUaHxm4KvUlWbEwxQ65d0vEW2flQb31aomLCy4boyyvfgWknqpqH_ItD7Sb4ohtA&sig=AHIEtbS5Fbr4pBgPii7yttGGqXwsDLIi7A, and also http://www.nexteraenergyresources.com/news/contents/2009/010709.shtml. For Genesis see http://www.energy.ca.gov/sitingcases/genesis_solar/index.html.

[2] http://www.energy.ca.gov/sitingcases/all_projects.html

[3] For Beacon, Ex. 623, available online at http://www.energy.ca.gov/sitingcases/beacon/documents/applicant/2008-02-01_DRY_COOLING_EVALUATION_TN-49597.PDF; for Genesis, the 76 page document cited and declared non-confidential (after the publication date of the Genesis SA) in http://www.energy.ca.gov/sitingcases/genesis_solar/documents/2010-01-14_Reponse_to_Application_for_Confidentiality+Cooling_Study_TN-54955.PDF.

1. Switching to dry cooling is economically even more attractive for Genesis than for Beacon

The Worley Parsons analysis for Beacon concludes that a shift from wet to dry cooling would reduce the Mwh output of the Beacon project by 7.50 percent,[4] increase its capital cost by $20.497 million,[5] but decrease its annual O&M cost by $1.288 million.[6] The net effect would be to reduce the net present value of the Beacon project by $71 million.[7] For Genesis, because groundwater at the site requires extensive treatment for the wet cooling process,[8] the net cost of changing to dry cooling would be smaller.[9] Specifically, the reduction in Mwh output from switching to dry cooling would be only 6.88%,[10] less than the 7.50% at Beacon. The incremental capital cost of dry cooling at Genesis would be only $516,000,[11] or only 2.5%[12] of the $20,497,000 incremental capital cost for Beacon.[13] And the benefit of decreased O&M costs would be slightly more at Genesis than at Beacon ($1.498 million per year[14] versus $1.298 million per year[15]). Thus, the total impact on NPV of switching to dry cooling would be only $43 million for Genesis,[16] versus $71 million for Beacon.[17] In percentage terms, the economic cost of switching to dry cooling at Genesis would be only 60 percent as large as the cost of doing so at Beacon.[18]

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[4] Beacon Exh. 623, p. 16.
[5] Ibid., p. 17.
[6] Ibid., p. 15.
[7] Ibid., p. 17.
[8] Worley Parsons, "Cooling Study – 125 MW Solar project," 8/11/2009 (cited below as "WP"), p. 4.
[9] The WP study is for a 125 MW project. The Applicant has indicated, in response to CURE data request set 3, questions 1-2, that the Genesis project will actually consist of two independent 125 Mw projects, and the results of the WP study can be simply doubled to show impacts for the Genesis project as a whole. Comparisons below between the WP studies for Genesis and Beacon take into account the fact that the Beacon study was for 250 Mw and the Genesis study was for 125 Mw.
[10] Based on output of 294.717 gwh per year per 125 Mw with wet cooling and 274.439 Mwh per year per 125 Mw with dry cooling. WP, p. 4. See also Exhibit 2, "solar field unchanged" column.
[11] WP, p. 8, bottom line, showing a difference between dry cooling and wet cooling capital costs of $258,000 per 125 Mw unit. $258,000 x 2 = $516,000 for the full 250 Mw Genesis project.
[12] See Exhibit 2, "Capital cost" line.
[13] Beacon Exh. 623, p. 17.
[14] WP, p. 20, next-to-last line, showing a difference of $746,000 per year per 125 Mw unit in O&M costs. $746,000 x 2 = $1.498 million for the full 250 Mw Genesis project.
[15] Beacon Exh. 623, p. 15, difference between O&M costs with and without dry cooling.
[16] See Exh. 2. For both Beacon and Genesis, the total NPV impact is the sum of the incremental capital cost, the NPV of the annual O&M cost impact, and the NPV of the annual generation revenue impact. For Beacon, the calculated total impact on NPV can be compared to the reported total impact on NPV from Beacon Exh. 623, p. 17, confirming that the calculations in Exhibit 2 match those done by the Applicant's Worley Parsons consultant. For Genesis, the capital cost comes directly from WP, p. 8; the net generation impact is calculated from the Mwh in WP, p. 4 and the price and NPV data in Beacon Exh. 623, p. 17; the O&M NPV cost comes from the annual data in WP, p. 20 and the NPV cost/annual cost ratio for O&M data shown in Beacon Exh. 623, pp. 15 and 17.
[17] Beacon Exh. 623, p. 17. The $71 million figure is also calculated from its components in Exhibit 2 to this testimony.
[18] $43 million/$71 million. See also Exh. 2 to this testimony, "Total impact on NPV" line.

The Worley Parsons data show three reasons why converting to dry cooling at Genesis would be less expensive than at Beacon. First, because groundwater at the project site requires considerable treatment for the wet cooling process, converting to dry cooling would save energy that would otherwise have to spent on water purification. The result is that the cost of lost generation due to dry cooling would be $6.5 million less at Genesis than at Beacon.[19] Second, again because groundwater at the project site requires extensive treatment for wet cooling, use of wet cooling would require substantial capital costs for water treatment.[20] The result is that the capital cost penalty for dry cooling at Genesis would be $20 million less than at Beacon.[21] Third, the lifecycle NPV benefit from reduced O&M with dry cooling would be $2.1 million bigger at Genesis than at Beacon.[22] The sum of these three differences, $28 million,[23] explains why the NPV of the economic cost of switching to dry cooling would be more than $28 million less at Genesis than at Beacon.[24]

2. Switching to dry cooling is economically viable at Beacon

The Applicant, the CEC staff, and CURE have all analyzed the economics of switching from wet cooling to dry cooling at Beacon. CURE concluded that doing so would have minor impacts on the economic viability of the Beacon project.[25] The CEC staff concluded that switching to dry cooling would leave the Beacon applicant with a project that was still economically viable, based on the rates of return accepted by other solar

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[19] See Exhibit 2, "NPV of generation impact" line. The NPV of lost revenue due to decreased generation is $63.86 million for Beacon. For Genesis, assuming the same value per Mwh at Genesis as at Beacon, and the same discount rate, the NPV of lost generation revenue is $28.67 million per 125 Mw unit, or $57.34 million for the full 250 Mw plant. The difference between $63.86 million and $57.34 million is $6.52 million.

[20] WP, p. 8

[21] $20.50 million incremental capital costs for dry cooling at Beacon, per Beacon Exh. 623, p. 17. $0.26 million incremental capital costs for dry cooling at each 125 Mw unit of Genesis, per WP, p. 8, resulting in $0.52 million of incremental capital cost for the full 250 Mw plant. $20.50 million minus $0.52 million = $19.98 million.

[22] See Exh. 2, "NPV of O&M cost impact" line. Switching to dry cooling provides a lifecycle NPV benefit of $12.98 million for O&M costs at Beacon per Beacon Exh. 623, p. 17. The corresponding benefit at Genesis is $7.52 million per 125 Mw unit, based on an annual benefit of $746,000 per WP, p. 20, and the same lifecycle NPV/annual benefit ratio used for Beacon. The total O&M benefit at Genesis of switching to dry cooling is thus $7.52 million times two, or $15.04 million, which is $2.06 million more than the Beacon benefit.

[23] $6.52 million plus $19.98 million plus $2.06 million (see preceding footnotes) equals $28.56 million.

[24] See Exh. 2, "Total Impact on NPV" line. The total economic penalty at Beacon for switching from wet to dry cooling is $71.38 million (or $71.1 million per Beacon Exh. 623, p. 17). The corresponding penalty at genesis is $21.41 million per 125 Mw unit, or $42.82 million for the full 250 Mw plant. The penalty is $71.38 – 42.82 = $28.56 million less at Genesis.

[25] CURE testimony regarding Beacon, Exh. 616, p. 5. ftn. 44.

developers.[26] The Applicant's numbers are confidential, but the Applicant never provided any testimony disputing the FSA or CURE regarding dry cooling, and the CEC staff's confidential analysis used the Applicant's own numbers.[27]

3. Conclusion

The unrebutted record in the Beacon proceeding shows that dry cooling would be economically feasible for Beacon. A comparison of the Applicant's analyses of dry cooling for Beacon and dry cooling for Genesis shows that the economic cost of switching to dry cooling is lower for Genesis than Beacon. Thus, it seems inescapable that dry cooling would also be economically feasible for Genesis. The fact that other applicants at the CEC are proposing on their own initiative to use dry cooling[28] is just further evidence for the economic viability of dry cooling.

B. Effect on the economics of dry cooling if the solar field were enlarged

1. Solar field enlarged by 12 percent

In the Beacon and Genesis analyses of dry cooling described above, switching to dry cooling reduces annual generation. It also reduces the maximum plant output to less than 250 Mw under maximum temperature conditions. One alternative, as acknowledged in the Genesis SA,[29] is to enlarge the size of the solar field at the same time that the cooling system is switched to dry cooling. In the case of Beacon, as the Beacon FSA explains, the additional solar field area needed to maintain a 250 Mw capacity for an air-cooled alternative at Beacon would not just lead to an additional annual cost. It would also result in 4.1 percent greater annual generation from an air-cooled alternative than from the Applicant's proposal.[30] The Beacon FSA indicates that to maintain a 250 Mw output under maximum temperature conditions would require expanding the solar field by 12 percent. That would more than offset the 7.5 percent annual average efficiency loss associated with dry cooling, leading to greater annual output with dry cooling.[31] In the case of Genesis, expanding the solar field by 12 percent would more than

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[26] Beacon FSA, pp. 6-13-14. See also the Genesis SA, p. B.2-18, which reiterates the conclusions of the Beacon FSA regarding the economic feasibility of dry cooling.
[27] Beacon FSA, pp. 6-12-13, describing the Applicant's data and its use by the CEC staff.
[28] See 07-AFC-5, Ivanpah Solar Electric Generating System; 09-AFC-7, Solar Millennium Palen Solar Power Project; 09-AFC-6 Solar Millennium Blythe Power Project; and 09-AFC-9 Solar Millennium Ridgecrest Power Project.
[29] Genesis SA, p. B.2-18.
[30] Beacon FSA, pp. 6-9, 6-40, 6-44.
[31] 1.12*(1-.075) > 1.00.

offset the 6.88 percent annual average efficiency loss,[32] leading to a 4.29% increase in annual output.[33] If the additional 25 gwh per year of generation[34] were sold at 15 cents per kwh (the price assumed by the Beacon Applicant in assessing dry versus wet cooling,[35] and used by the Staff as well in the Beacon case[36]), it would be worth $3.8 million per year.[37] The 30-year NPV of an additional $3.8 million per year of revenue would be over $35 million. That would be enough to offset all but $2.7 million (0.3 percent) of the 30-year NPV incremental cost of dry cooling.[38]

In other words, the economics of Genesis with dry cooling and a twelve percent larger solar field are virtually identical (within 0.3 percent) of the economics of Genesis as proposed with wet cooling, and are better than the economics of Genesis with dry cooling but no expansion of the solar field. This is consistent with the findings in the Beacon case, where the CEC staff concluded that dry cooling with a 12 percent larger solar field was economically superior to both wet cooling and to dry cooling with no increase in the size of the solar field.[39]

2. Solar field enlarged by 7.39 percent

The Genesis SA suggests that a 12 percent increase in the Genesis solar field would require 150 acres, which may not be available.[40] However, this large of an increase is not required either to maintain the annual Mwh output of Genesis or its net Mw output. The annual Mwh output decrease due to dry cooling is 6.88%, which would be offset by a 7.39% increase in the solar field size.[41] The net output of Genesis under maximally adverse conditions[42] with dry cooling and no increase in solar field size would be 239.8 Mw.[43] Increasing the field size by 7.39 percent would increase the plant output to over 250 Mw.[44] Thus it is sufficient to increase the field size by just

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[32] WP, p. 4. See also the Genesis SA, p. B.2-18, which rounds the 6.88 percent reduction to 6.9%.
[33] 1.12*(1-.0688) = 1.0429.
[34] 294.7 gwh per 125 Mw unit with wet cooling, per WP, p. 4, implying 589.4 gwh for the full 250 Mw plant. 4.29% increase in output with dry cooling and a 12% larger solar field (see the previous footnote. 589.4 x .0429 = 25.3 gwh.
[35] Beacon Exh. 623, pp. 15 and 17 (45162 Mwh sell for $6,774,300; $6774300/45162 Mwh = $150/Mwh).
[36] Beacon FSA, p. 4.9-158.
[37] 25.3 gwh/year x $150/Mwh x 1000 Mwh/gwh = $3.795 million/year.
[38] See Exhibit 2, "Solar Field expanded 12%" column, and double the cost numbers there to reflect the difference between one 125 Mw Genesis unit and the full 250 Mw plant.
[39] Beacon FSA, pp. 6-12-13.
[40] Genesis SA, p. B.2-18.
[41] (1-.0688) * (1 + .0739) = 1.00.
[42] 122 degrees F and 9 percent relative humidity. WP, Appendix 4, "NextEra – Ford Dry Lake Dry Cooled CSP Plant Performance Evaluation," 4th page.
[43] Ibid., showing 119.931 Mw per unit, or 239.862 Mw for the full plant.
[44] 239.862 * 1.0739 > 250.

7.39 percent, or 92 acres,[45] to maintain both annual Mwh output at the same annual level as with wet cooling and also maintain maximum output of 250 Mw under all temperature/humidity conditions.

A 7.39% increase in solar field size would (assuming a cost increase proportional to that at Beacon) result in a net cost life cycle NPV penalty of only $18.1 million,[46] or 2.2%.[47] That is barely one fourth the penalty associated with dry cooling for Beacon with no solar field increase,[48] a penalty which the CEC staff found would leave the Beacon project still economically viable.[49] It is also less than half the penalty associated with converting Genesis to dry cooling without expanding the solar field.[50] As with Beacon, expanding the solar field improves project economics.

3. Conclusion

As with Beacon, enlarging the solar field improves the economics of dry cooling. As with Beacon, enlarging the solar field by 12 percent makes the economics of dry cooling comparable to if not superior to the economics of wet cooling. If a 12 percent enlargement of the solar field is not feasible due to lack of space, a 7.39 percent enlargement would be sufficient to avoid any reduction in annual Mwh output or peak Mw output under extreme temperature conditions. Dry cooling with a 7.39% solar field expansion would have better economics than simply converting to dry cooling. Since switching to dry cooling at Genesis is cheaper than switching to dry cooling at Beacon, and switching to dry cooling with an expanded solar field is cheaper yet, and because switching to dry cooling at Beacon is economically feasible and provides an adequate return to investors,[51] switching to dry cooling at Genesis with an expanded solar field is economically feasible.

---

[45] A 12 percent field increase is equal to 150 Mw, per the Genesis SA, p. B.2-18. Thus a 7.39% field increase would only require 150 acres x .0739/.12 = 92.375 acres.
[46] $9.057 million per 125 Mw unit, or $18.114 million for the full 250 Mw Genesis plant. See Exhibit 2, "Solar Field expanded 7.39%" column.
[47] See Exhibit 2, "Solar Field expanded 7.39%" column.
[48] See Exhibit 2, "Total Impact on NPV" row.
[49] Beacon FSA, p. 6-13.
[50] See Exh. 2, "Total Impact on NPV" line. 2.17% is less than half of 5.14%.
[51] Beacon FSA, pp. 6-12-13.

DECLARATION

I, David Marcus, declare as follows:

I have reviewed the above testimony regarding the Genesis Solar Energy Project. To the best of my knowledge, all of the facts in my testimony are true and correct. To the extent that this testimony contains opinion, such opinion is my own.

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

Dated: 5/27/10 Signed: _David Marcus

PROOF OF SERVICE

I, Bonnie Heeley, declare that on June 18, 2010 I served and filed copies of the attached **Testimony of David Marcus on behalf of the California Unions for Reliable Energy on Soil and Water Resources for the Genesis Solar Energy Project**. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at www.energy.ca.gov/sitingcases/beacon. The document has been sent to both the other parties in this proceeding as shown on the Proof of Service list and to the Commission's Docket Unit electronically to all email addresses on the Proof of Service list and by depositing in the U.S. Mail at South San Francisco, CA with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list to those addresses NOT marked "email preferred." I also sent a copy via email and an original and one copy via U.S. mail to the California Energy Commission Docket Office.

I declare under penalty of perjury that the foregoing is true and correct. Executed at South San Francisco, CA on June 18, 2010.

_____

Bonnie Heeley

EXHIBIT 1

RESUME

DAVID I. MARCUS
P.O. Box 1287
Berkeley, CA 94701-1287

January 2010

Employment

Self-employed, March 1981 - Present

Consultant on energy and electricity issues. Clients have included Imperial Irrigation District, the cities of Albuquerque and Boulder, the Rural Electrification Administration (REA), BPA, EPA, the Attorney Generals of California and New Mexico, alternative energy and cogeneration developers, environmental groups, labor unions, other energy consultants, and the Navajo Nation. Projects have included economic analyses of utility resource options and power contracts, utility restructuring, utility bankruptcy, nuclear power plants, non-utility cogeneration plants, and offshore oil and hydroelectric projects. Experienced user of production cost models to evaluate utility economics. Very familiar with western U.S. grid (WSCC) electric resources and transmission systems and their operation and economics. Have also performed EIS reviews, need analyses of proposed coal, gas and hydro powerplants, transmission lines, and coal mines. Have presented expert testimony before FERC, the California Energy Commission, the Public Utility Commissions of California, New Mexico, and Colorado, the Interstate Commerce Commission, and the U.S. Congress.

Environmental Defense Fund (EDF), October 1983 - April 1985

Economic analyst, employed half time at EDF's Berkeley, CA office. Analyzed nuclear power plant economics and coal plant sulfur emissions in New York state, using ELFIN model. Wrote critique of Federal coal leasing proposals for New Mexico and analysis of southwest U.S. markets for proposed New Mexico coal-fired power plants.

California Energy Commission (CEC), January 1980 - February 1981

Advisor to Commissioner. Wrote "California Electricity Needs," Chapter 1 of Electricity Tomorrow, part of the CEC's 1980 Biennial Report. Testified before California PUC and coauthored CEC staff brief on alternatives to the proposed 2500 megawatt Allen-Warner Valley coal project.

CEC, October 1977 - December 1979

Worked for CEC's Policy and Program Evaluation Office. Analyzed supply-side alternatives to the proposed Sundesert nuclear power plant and the proposed Point Concepcion LNG terminal. Was the CEC's technical expert in PG&E et. al. vs. CEC lawsuit, in which the U.S. Supreme Court ultimately upheld the CEC's authority to regulate nuclear powerplant siting.

Energy and Resources Group, U.C. Berkeley, Summer 1976

Developed a computer program to estimate the number of fatalities in the first month after a major meltdown accident at a nuclear power plant.

Federal Energy Agency (FEA), April- May 1976

Consultant on North Slope Crude. Where To? How?, a study by FEA's San Francisco office on the disposition of Alaskan oil.

Angeles Chapter, Sierra Club, September 1974 - August 1975

Reviewed EIRs and EISs. Chaired EIR Subcommittee of the Conservation Committee of the Angeles Chapter, January - August 1975.

Bechtel Power Corporation (BPC), June 1973 - April 1974

Planning and Scheduling Engineer at BPC's Norwalk, California office. Worked on construction planning for the Vogtle nuclear power plant (in Georgia).

Education

Energy and Resources Group, U.C. Berkeley, 1975 - 1977

M.A. in Energy and Resources. Two year master's degree program, with course work ranging from economics to engineering, law to public policy. Master's thesis on the causes of the 1972-77 boom in the price of yellowcake (uranium ore). Fully supported by scholarship from National Science Foundation.

University of California, San Diego, 1969 - 1973

B.A. in Mathematics. Graduated with honors. Junior year abroad at Trinity College, Dublin, Ireland.

Professional Publications

"Rate Making for Sales of Power to Public Utilities," with Michael D. Yokell, in Public Utilities Fortnightly, August 2, 1984.

EXHIBIT 2

Exhibit 2

Dry cooling versus applicant-proposed technology

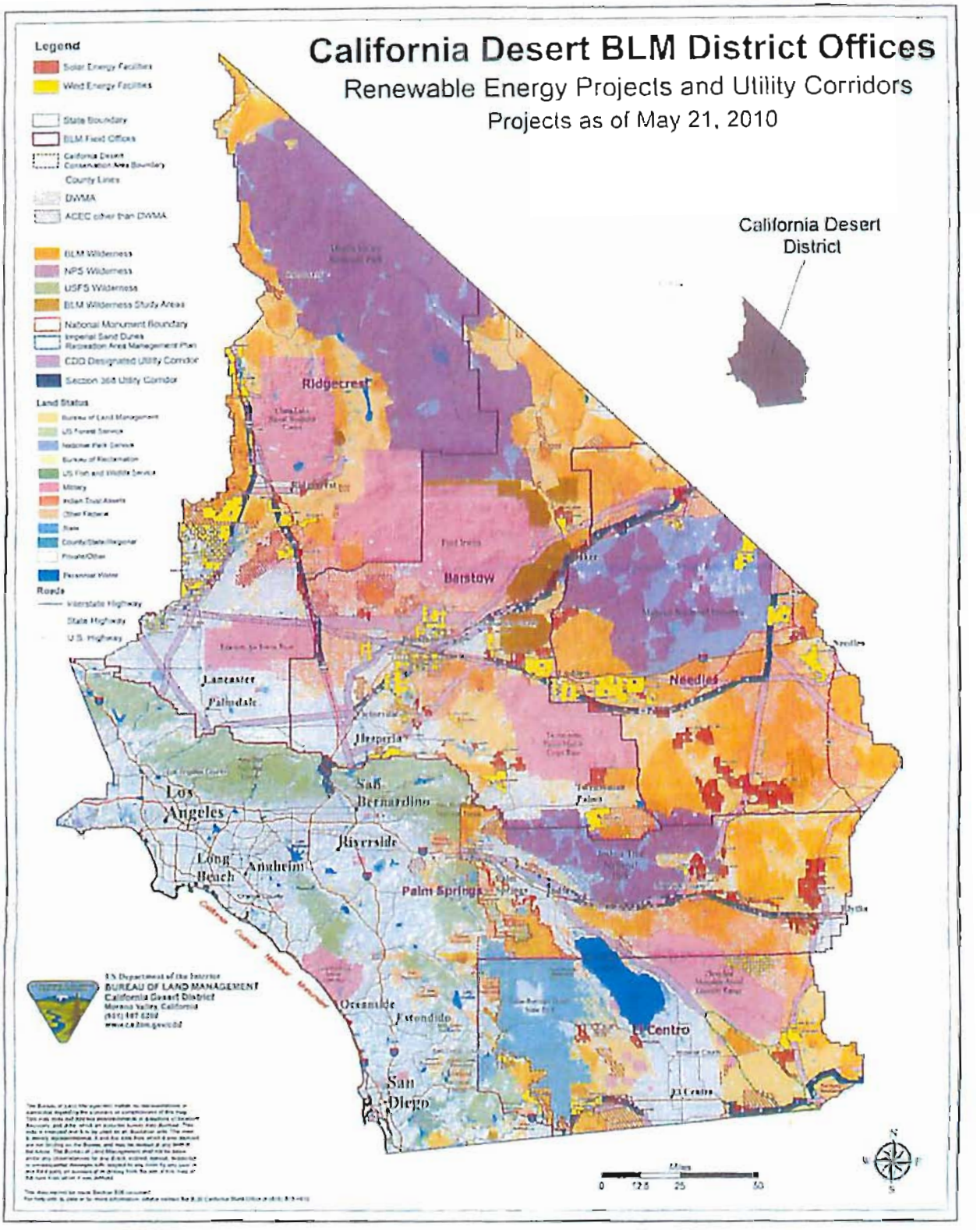
Parameter	Beacon dry cooling (250 Mw plant)				Genesis dry cooling (125 Mw unit)				Genesis as % of Beacon on a per-Mw basis		
	Solar Field Unchanged	Page # in WP study	Solar Field Expanded	Page # in WP study	Solar Field Unchanged	Page # in WP study	Solar Field Expanded 12.00%	Solar Field Expanded 7.39%	Solar Field Unchanged	Solar Field Expanded 12.00%	Solar Field Expanded 7.39%
Annual output with wet cooling	602527	p. 16	602527		294717	p. 4	294717	294717	97.6%		
Net generation impact (Mwh)	-45,162	p. 17	0		-20,278	p. 4	12655	0	89.8%		
% reduction in net gen	-7.50%	p. 16	0.00%	Note A	-6.88%		4.29%	0.00%	91.8%		
Revenue impact of net gen	-$6,774,300	p. 17	$0		-$3,041,700		$1,898,202	$0	89.8%		
Capital cost	-$20,497,000	p. 17	-$73,497,000	p. 17	-$258,000	p. 8	-$26,758,000	-$16,575,135	2.5%	72.8%	45.1%
Annual O&M cost impact	$1,288,000	p. 15	$1,288,000		$746,000	p. 20	$746,000	$746,000	115.8%	115.8%	115.8%
NPV of O&M cost impact	$12,980,000	p. 17	$12,980,000	p. 17	$7,517,919		$7,517,919	$7,517,919	115.8%	115.8%	115.8%
NPV of generation impact	-$63,860,000	p. 17	$0		-$28,673,510		$17,893,979	$0	89.8%		
Total impact on NPV	-$71,377,000		-$60,517,000		-$21,413,591		-$1,346,102	-$9,057,216	60.0%	4.4%	29.9%
Reported total impact on NPV	-$71,100,000	p. 17	-$60,100,000	p. 17							
Price at which output is sold ($/Mwh)	$150	p. 17	$150		$150		$150	$150			
NPV of 30-year output, wet cooling	$851,988,467		$851,988,467		$416,737,316		$416,737,316	$416,737,316			
Total impact on NPV	-8.38%		-7.10%		-5.14%		-0.32%	-2.17%			

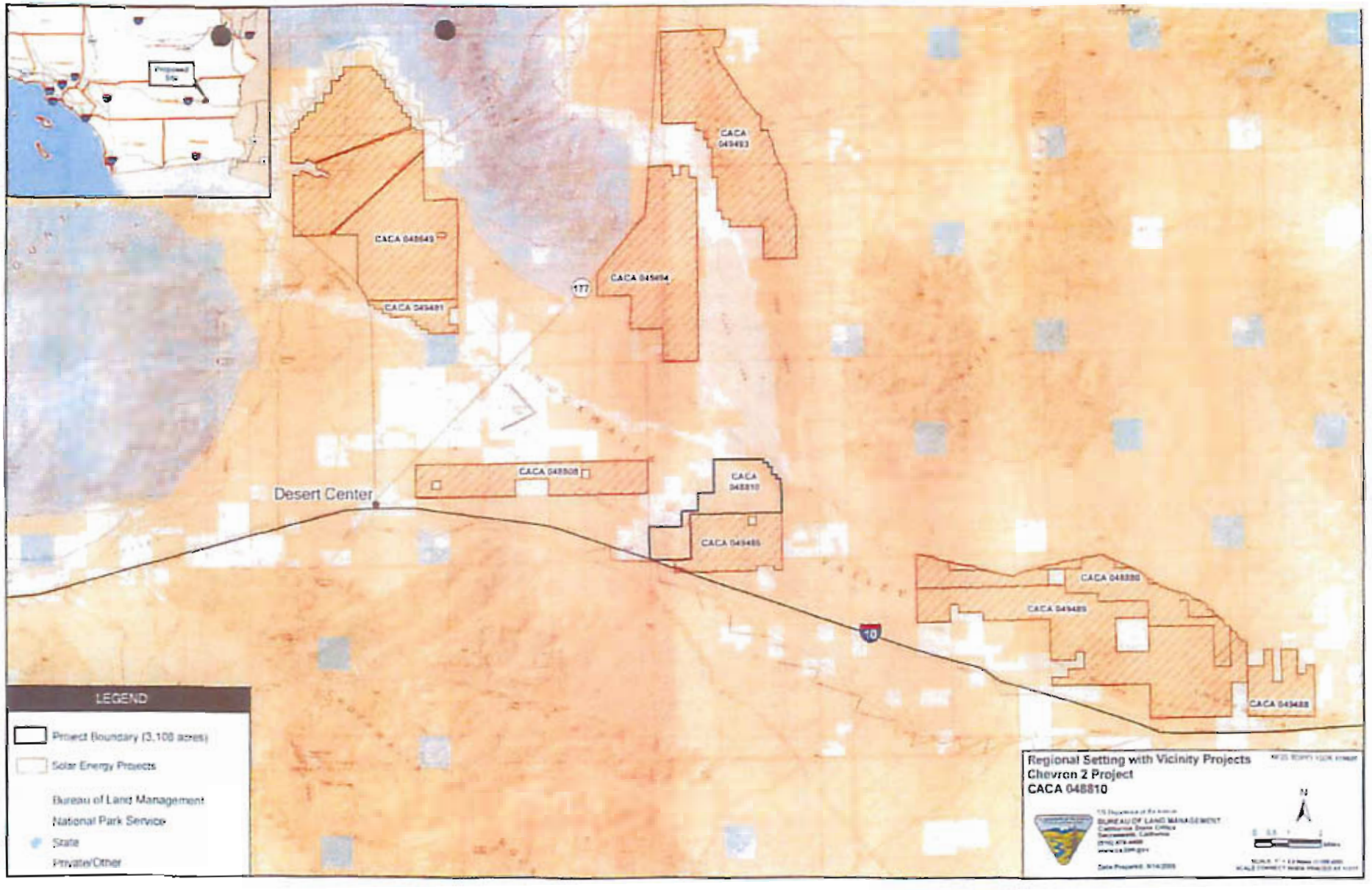
Per WP pp. 15, 17 for BSP:	Implicit O&M inflation rate	0.7991%
	NPV/annual cost for O&M	10.07764
Per WP p. 17 for BSP:	NPV/annual cost for generation	9.42680
	Implicit discount rate	10.000%

NPV discount rate calculator and escalation rate calculator		NPV of revenues with wet cooling
1	1	$44,207,550
1	1.007991	$44,207,550
1	1.016046	$44,207,550
1	1.024165	$44,207,550
1	1.032349	$44,207,550
1	1.040599	$44,207,550
1	1.048914	$44,207,550
1	1.057296	$44,207,550
1	1.065745	$44,207,550
1	1.074261	$44,207,550
1	1.082846	$44,207,550
1	1.091499	$44,207,550
1	1.100221	$44,207,550
1	1.109013	$44,207,550
1	1.117875	$44,207,550
1	1.126808	$44,207,550
1	1.135812	$44,207,550
1	1.144888	$44,207,550
1	1.154037	$44,207,550
1	1.163259	$44,207,550
1	1.172555	$44,207,550
1	1.181925	$44,207,550
1	1.191369	$44,207,550
1	1.20089	$44,207,550
1	1.210486	$44,207,550
1	1.220159	$44,207,550
1	1.229909	$44,207,550
1	1.239737	$44,207,550
1	1.249644	$44,207,550
1	1.25963	$44,207,550
9.4268	10.0776	$416,737,316

Note A: Should have been 4.1%, not zero, per Beacon FSA, pp. 6-9, 6-40, 6-44

Attachment F


California Desert BLM District Offices
Renewable Energy Projects and Utility Corridors
Projects as of May 21, 2010
Legend
Solar Energy Facilities
Wind Energy Facilities
State Boundary
BLM Field Offices
California Desert Conservation Area Boundary
County Lines
DWMA
ACEC other than DWMA
BLM Wilderness
NPS Wilderness
USFS Wilderness
BLM Wilderness Study Areas
National Monument Boundary
Imperial Sand Dunes Recreation Area Management Plan
CDD Designated Utility Corridor
Section 368 Utility Corridor
Land Status
Bureau of Land Management
US Forest Service
National Park Service
Bureau of Reclamation
US Fish and Wildlife Service
Military
Indian Trust Assets
Other Federal
State
County/State/Regional
Private/Other
Paramour Mine
Roads
Interstate Highway
State Highway
U.S. Highway
California Desert District
Ridgecrest
Barstow
Needles
Lancaster
Palmdale
Hesperia
San Bernardino
Los Angeles
Riverside
Long Beach
Anaheim
Palm Springs
Oceanside
Escondido
El Centro
San Diego
U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT
California Desert District
Moreno Valley, California
0 12.5 25 50


Desert Center
CACA 048649
CACA 049491
CACA 049494
CACA 049493
CACA 048508
CACA 048810
CACA 049485
CACA 048880
CACA 049489
CACA 049488
177
10
LEGEND
Project Boundary (3,100 acres)
Solar Energy Projects
Bureau of Land Management
National Park Service
State
Private/Other
Regional Setting with Vicinity Projects
Chevron 2 Project
CACA 048810
BUREAU OF LAND MANAGEMENT
N

for Alison Shaffer
from Joan Taylor
re Genesis
date 7/8/10

26 pgs incl cover

CNRCC DESERT COMMITTEE

July 8, 2010

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BY EMAIL, FAX AND US MAIL

RE: Sierra Club comments on the proposed Genesis Solar Energy Project Staff Assessment and Draft Environmental Impact Statement and California Desert Plan Amendment

Dear Ms. Shaffer and Mr. Monasmith:

On behalf of the Sierra Club, I am writing to provide you with comments on the Staff Assessment and Draft Environmental Impact Statement (SA/DEIS) and California Desert Conservation Area Plan Amendment for the Genesis Solar Energy Project (09-AFC-8). The United States Department of the Interior, Bureau of Land

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Management's (BLM) SA/DEIS is a joint document prepared with the California Energy Commission ("Commission") in order to meet the requirements of the National Environmental Policy Act ("NEPA") and California Environmental Quality Act ("CEQA").

The Sierra Club is the oldest conservation organization in the United States, with over 600,000 members nationwide, and 151,000 members in California alone. Sierra Club is steadfastly committed to preserving the legacy of California's wildlands for future generations, while simultaneously recognizing that climate change has the potential to make radical changes in our habitats and landscapes. Sierra Club is working aggressively to reduce carbon emissions by supporting large scale renewable projects and by quickly ramping up energy efficiency and rooftop solar.

In order to help meet California's and the nation's renewable energy goals, the Sierra Club supports appropriately sited large-scale renewable development, i.e, projects that avoid or greatly minimize environmental impacts to wildlife and plants and the ecosystems they depend upon. For example, there are hundreds of thousands of acres of privately held agricultural lands in California that have marginal productivity or no longer support farming. These lands, with relatively high solarity and poor habitat values, present many opportunities to help meet our goals for large scale solar. The Sierra Club encourages companies and agencies to prioritize these types of lands going forward.

Introduction

The applicant Genesis Solar LLC proposes to develop an electric-generating facility with a nominal capacity of 250 megawatts (MW) using a concentrated solar "trough" generating system. The Genesis project is proposed to be located in the eastern portion of Riverside County, California, north of Interstate 10 near Desert Center. The site is approximately 25 miles west of Blythe and several miles north of Interstate 10. The proposed project is comprised entirely of BLM managed lands. Construction and operation of the project would directly disturb 1800 acres for the project itself, plus 90 acres for transmisson, natural gas line and road (totaling approximately 3 square miles). In addition, the Project will disturb an undetermined number of acres off-site through indirect impacts.

The project also includes flood control facilities, propane supply tanks, a bioremediation site, and a site access road. The project would consume approximately 2440 acre feet of water during construction and 1644 acre feet of local groundwater per year thereafter for operations, washing mirrors, etc. Propane stored in onsite tanks would be used to heat project operating fluid at night and bring it up to operating temperature in the morning in an auxiliary boiler. The

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project would be connected to the SCE Substation via 6.5 miles of a new gen-tie line, and its power would be transmitted to load centers via either the existing Devers to Palo Verde line, or the new Devers to Palo Verde 2 line which the Sierra Club supports. The project would have up to 50 acres of evaporation ponds as well as a several acre bioremediation site to deal with small amounts of leaking hazardous fluids; larger amounts would have to be removed and treated offsite. The actual electrical capacity factor would be a small fraction of the nameplate 250 MW. The project is proposed to be "wet cooled." There is no proposal at this site to "store" thermal energy for use after sundown.

The Genesis project is proposed in a portion of the Colorado Desert of California that is an intact, functioning ecosystem.[1] The immediate project area has no development. It is located on the shore of an ancient dry lake and immediately bordering the Palen-McCoy Wilderness. Water use of the project is unmitigated and unacceptable. Cultural, biological and other significant impacts of the project remain to be adequately addressed.

BLM & the Commission's Responsibilities under NEPA & CEQA

The National Environmental Policy Act ("NEPA") is our "basic national charter for the protection of the environment." 40 C.F.R. § 1500.1. Congress enacted NEPA "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; [and] to enrich the understanding of the ecological systems and natural resources important to the Nation." 42 U.S.C. § 4321. To accomplish these purposes, NEPA requires all agencies of the federal government to prepare a "detailed statement" that discusses the environmental impacts of, and reasonable alternatives to, all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). This statement is commonly known as an environmental impact statement ("EIS"). See 40 C.F.R. Part 1502.

The EIS must "provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This discussion must include an analysis of "direct effects," which are "caused by the action and occur at the same time and place," as well as "indirect effects which . . . are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8. An EIS must also consider the cumulative impacts of the proposed federal agency action together with past, present and reasonably foreseeable future actions, including all

[1] Sierra Club scoping comments on Genesis Solar Power Project, December 2009

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federal and non-federal activities. 40 C.F.R. § 1508.7. Furthermore, an EIS must "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed project. 40 C.F.R. § 1502.14(a).

The regulations implementing NEPA identify several factors that, when present, indicate that the environmental effects of a proposed action are significant. These include the presence of highly uncertain impacts, impacts to species listed as threatened under the Endangered Species Act, and cumulatively significant impacts. 40 C.F.R. §§ 1508.27(b)(5), (b)(7), (b)(9). This project contains federally listed sensitive species, California special status species, flood hazards, and will have a cumulatively significant impact on the desert environment.

The California Energy Commission, as the lead agency under CEQA, is responsible for preparing a document to inform the public and decision makers as to the project's environmental impacts. Pub. Res. Code § 25519(c), 21080.5. CEQA is designed to fulfill two important goals in the protection of the environment. EIR's (or their functional equivalent) must inform the public and decision makers about all potential, significant environmental effects of a project. Pub. Res. Code § 21100(b)(1). It is necessary to highlight the potential environmental effects "with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences." 14 Cal. Code Reg. § 15151. An agency must diligently examine these effects and "must use its best efforts to find out and disclose all that it reasonably can." Id. § 15144.

This SA/DEIS is legally and technically flawed under both NEPA and CEQA. As drafted, it is inadequate as an informational document because essential information was omitted, or is not available to the public or key agencies. The SA/DEIS also fails under substantive provisions of California law requiring the full mitigation of impacts to threatened species. This project will have serious unaddressed negative direct impacts to groundwater supplies, cultural and biological resources. Additionally its cumulative impacts have not been adequately analyzed. As such the SA/DEIS should have contained all feasible mitigation measures and reasonable alternatives available. Accordingly, the BLM and the Commission should fully and completely address the balance of deficiencies and concerns surrounding the SA/DEIS and revise and re-release the SA/DEIS. Additionally, it should require that the project utilize 100% dry cooling to ensure protection of desert water resources and dependent wildlife.

The SA/DEIS is Inadequate Because it Lacks Critical Data For Issues that Will Impact the Environment and Defers Information Gathering and Analysis

A major flaw with the SA/DEIS is the omission of relevant critical data in several important respects. Boiled down, the SA/DEIS omitted disclosure of the full-

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range of potentially significant impacts associated with the Project. Although the SA/DEIS acknowledged these data gaps, it provided no legal reason under NEPA or CEQA as to why these gaps were permitted.

This is inadequate under both NEPA & CEQA. Under NEPA's implementing regulations: "If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement." 40 C.F.R. § 1502.22. The agency did not claim that this information was cost prohibitive to obtain, and the information that is omitted from the SA/DEIS is certainly "essential to a reasoned choice." 40 C.F.R. § 1502.22(a).

NEPA's implementing regulations make it clear that "NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." 40 C.F.R. 1501.1 (emphasis added). CEQA contains similar requirements; public participation is at the heart of CEQA, therefore the public must be able to review and comment on technically accurate and complete EIRs. CEQA requires agencies to inform the public and responsible officials of the environmental consequences of their decisions before they are made, thereby protecting the environment and informed self-government. (Berkeley Keep Jets Over the Bay Com. v. Board of Port Comrs. (2001) 91 Cal.App.4th 1344, 1354.)

The following are a sample of the acknowledged areas where there are missing elements in the SA/DEIS.

- Groundwater Level Monitoring and Reporting Plan , Ground Subsidence Monitoring and Action Plan, Groundwater Level and Quality Monitoring and Reporting Plan, Channel Maintenance Program, Biological Resources Mitigation and Monitoring Plan, Draft Groundwater-Dependent Vegetation Monitoring Plan, Re-vegetation Plan, Decommissioning Plan, Final Drainage Erosion and Sedimentation Control Plan, , Programmatic Agreement for Cultural Resources, Channel Maintenance Program, and other essential Project elements have not been developed due to critical data that is lacking.
- Grading and Drainage plans need to be revised: "Channel confluence design must be given special consideration, especially as the preliminary Grading and Drainage Plans show 90 degree angles of confluence at nearly all locations. The issues of confluence hydraulics and potential scour shall be specifically addressed in the revised Drainage Report." SA/DEIS C.9-102

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- Spring and fall surveys for special status plant species within the disturbance areas are planned but not yet performed or available. SA/DEIS C.2-6.
- Protocol surveys for threatened desert tortoise have not yet been performed along the rerouted approximately six mile Project gen tie transmission line. SA/DEIS C.2-158
- Information related to translocation of the tortoise, specifically location of the proposed site for relocating tortoise and verification of disease testing requirements is missing or located in an appendix not accessible by the public, and as such that program cannot be assessed.[2]
- Project impacts to invertebrates are not adequately assessed
- Surveys for Couch's Spadefoot Toad, breeding habitat and Mojave Desert Tortoise along the Project's linear components have not been performed. SA/DEIS C.2-6.

These and other omissions and data gaps violate both NEPA and CEQA. The role of a SA/DEIS under NEPA is to provide the public with enough information to adequately assess the environmental dangers of a particular project. Indeed, if reasonably complete information is not included, "neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." Robertson v. Methow Valley Citizens Council, U.S. 332, 352 (1989). Under CEQA, courts have made clear that environmental assessments must provide sufficient information to allow both decision-makers and the public to understand the consequences of the project. Napa Citizens for Honest Gov't v. Napa County Board of Supervisors, (2001) Cal.App.4th 342, 356. The information presented in an EIS must be of high quality. 40 C.F.R. § 1500.1(b). "Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." Id. "Agencies shall insure the professional integrity, including scientific integrity, of the decisions and analysis in environmental impact statements." 40 C.F.R. § 1502.24. "They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement." Id.

The amount of missing, incomplete, or incorrect data requires the BLM and the Commission to deny the Applicant's proposal, or at the very least, complete gathering all of the necessary information for public review and comment in a revised SA/DEIS.

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[2] "The final Plan shall be based on the draft Desert Tortoise Relocation/Translocation Plan submitted by the Applicant (TTEC 2010a) and shall include all revisions deemed necessary by BLM, USFWS, CDFG and the Energy Commission staff." SA/DEIS C.2-174.

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The Analysis of Impacts to Groundwater is Inadequate

The Project proposes to use local groundwater from onsite wells to provide cooling for the heat transfer fluid ("wet cooling") instead of using dry cooling as other solar trough projects in the Chuckwalla Groundwater Basin are proposing. SA/DEIS 88-89. This is unacceptable, and its proposed use of nearly 1,700 acre feet a year causes potentially significant unmitigated impacts to biological resources as well as groundwater supply and quality. Additionally, wet cooling (especially in arid regions) and its liquid discharges are out of compliance with State water policy. SA/DEIS C.9-2, C.9-88-89. Some of these unmitigated impacts are identified, but most are not because the SA/DEIS relies on vague and yet-to-be formulated mitigations.

Groundwater Supply

The SA/DEIS correctly finds that the cumulative drawdown caused by water use of the Project, in combination with other projects and existing uses, would exceed the recharge of the Chuckwalla Groundwater Basin (CGWB). But then it goes on to assert that this cumulative drawdown is not significant compared to the recoverable storage in the CGWB . SA/DEIS C.9- 72-73. The problem is that the SA/DEIS fails to provide any basis for its assertion that the recoverable storage in the Chuckwalla Groundwater Basin is "as much as 15,000,000 acre feet." SA/DEIS C.9-72. In fact, there is no entity managing groundwater production and no management plan has been submitted to California Department of Water Resources for the CGWB. SA/DEIS C.9-16. But, even if the amount of water in storage were demonstrated to be as large as asserted, no evidence has been provided that 15,000,000 acre feet of water are actually recoverable, or if so, at what expense that might be accomplished.

Compounding this inadequacy, the SA/DEIS estimates the cumulative water groundwater extraction during operations of this and other reasonably foreseeable projects to be approximately 3,745 acre feet a year. SA/DEIS C.9- 72-73. However, the SA/DEIS has restricted its analysis to just the identified large energy-related projects. No consideration is given to water use of such reasonably foreseeable future projects as the Eagle Mountain Landfill project, or of urban growth in the Chuckwalla Valley, which is likely occur in order to accommodate the workforces of these various solar projects. Thus, the SA/DEIS has used an overly restricted number for future cumulative groundwater use, but has used the largest conceivable number ("*as much as* 15,000,000 acre feet" SA/DEIS C.9-72-73) to represent groundwater that is recoverable.

The overriding concern with the Project's unnecessary proposal to use wet cooling is the consequent massive use of a finite resource that has other beneficial uses, plus values for wildlife. This equates to a waste of water prohibited under the State

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Constitution.[3] Unfortunately, here too the SA/DEIS leaves the reviewer less than adequately informed. It recognizes the Project's proposed wet cooling is a violation of State water policy (SA/DEIS C.9-88-89), but then fails to adequately address the issue. The only condition proposed for water policy compliance is Soil & Water-18, which reads in its totality: "Pending agreement on the actions needed to bring the project into compliance with the water policy." SA/DEIS C.9-110

Groundwater Quality

The Project includes an onsite component called a Land Treatment Unit. Basically, the Land Treatment Unit is a 10 acre area used for bioremediation of soil expected to be contaminated with the heat transfer fluid, Therminol. SA/DEIS C.13-8. This is a hazardous material and there will be 2 million gallons of it in the trough system. The SA/DEIS acknowledges that there are expected leaks and spills and that storm water may accumulate in the bermed Land Treatment Unit. SA/DEIS B.10. 10

> "Due to the uncertainty associated with the potential to impact groundwater quality[4] and the regulatory requirements for operation of the Land Treatement [sic] Unit. surface impoundments as well as stormwater and potentially septic system operations, staff recommends implementation of specific monitoring and mitigation requirements." SA/DEIS C.9-54.

But what are those specific monitoring and mitigation requirements, that the SA/DEIS is expected to disclose for public review? For one, the Waste Discharge Requirements have not been developed: "Conditions to require implementation of waste discharge requirements for LTU [Land Treatment Unit] and surface impoundments are currently in development and will be included in the SA/FEIS." SA/DEIS C.9-100. For another, six weeks prior to construction the following must be submitted for review and approval: the Groundwater Level and Quality Monitoring and Reporting Plan (SA/DEIS C.9-13); the Well Monitoring Installation and Groundwater Level Network Report. Id. Then, four weeks prior to construction groundwater quality and groundwater level monitoring data shall be reported to the

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[3] "It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare." article_10 State of California Constitution Article X §2 http://www.leginfo.ca.gov/.const/.

[4] Depth to groundwater is only 70 to 90 feet below the surface. SA/DEIS C.9-52. "However, due to the uncertainty associated with the amount of information available concerning shallow groundwater quality, continuity of confining layers and on vertical migration, implementation of Conditions of Certification .. are expected to minimize impacts to groundwater quality below the level of significance." C.9-51

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CPM [SPELL]. SA/DEIS C.9-114.

In other words, there are virtually no relevant specifics to review. These mitigations must be spelled out in the SA/DEIS. And given the fast-track schedule of approval, any conditions purporting to reduce Project impacts to groundwater supply and quality are not likely to be subject to adequate environmental review unless they are developed immediately for inclusion in a revised and re-circulated SA/DEIS.

Further, monitoring is not mitigation. In some cases, the SA/DEIS does require actions to remediate future groundwater problems. However, these actions are either entirely non-specific or are of questionable feasibility. For example, if data from the proposed monitoring indicate that the water quality has deteriorated[5] for three consecutive years, the project owner shall provide treatment *or a new water supply* to either meet or exceed pre-project water quality conditions. SA/DEIS 9-115. The SA/DEIS does not indicate: where that new water supply would be found; whether it is expected to be available; at what cost it would be acquired and delivered; and why the SA/DEIS is not proposing a bond or other surety for what may become an enormously expensive water replacement scheme.

Subsidence

In view of the Project's massive groundwater draw, plus drawdown from other cumulative projects, the SA/DEIS identifies ground subsidence as an issue of concern. SA/DEIS C.9-110. Yet no assessment of this impact is provided; the SA/DEIS simply defers this issue to future preparation of a plan for monitoring and remedial action, not required to be prepared until 30 days prior to groundwater extraction. SA/DEIS C.9-110. This constitutes another impermissible deferral of information, analysis and mitigation.

Groundwater-Dependent Biological Resources

The Project has potential significant impacts to groundwater-dependent exosystems in the Chuckwalla Basin: "The lowering of groundwater levels could have a significant impact to biological resources... Even modest drawdowns of 0.3 feet can adversely affect vegetation." SA/DEIS C.2 -155. However the potential effects have not been adequately quantified nor has the proposed mitigation/remediation been identified.

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[5] The SA/DEIS does not disclose all the specific contaminants to be monitored or what level would constitute deteriorated. "(exceeds pre-project constituent concentrations in TDS, sodium, chloride, or other constituents identified as part of the monitoring plan) SA/DEIS C.9-115 "Considerable uncertainty remains as to the potential extent of Project impacts to groundwater (see Soil and Water section) and to groundwater dependent plant communities, but staff considers these impacts to be potentially significant." SA/DEIS C.2-155.

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The applicant contends that proposed deep pumping (800' or more before ground surface) would not affect the perched water table upon which various seeps, springs and groundwater-dependent communities rely.[6] Yet the SA/DEIS questions the impermeability of the layers separating the shallow groundwater zone from the deeper zones: "Staff, however, is concerned about the level of uncertainty in such a prediction and the potential influence of groundwater pumping in the shallow aquifer if the low permeability layers are fractured, as they often are (Deacon et al 2007)." SA/DEIS C.2-97.

In the face of the uncertainty on this critical issue, the agencies should adopt the Dry Cooling Alternative and require further testing. Instead, the proposed mitigation is uncertain and potentially infeasible. It relies on the development of a Groundwater Level Monitoring and Reporting Plan and a Vegetation Monitoring and Reporting Plan, neither of which are available for review. SA/DEIS C.2-155, 156. Further, since monitoring is not mitigation, the agencies are proposing that in the event the yet-to-be-determined monitoring triggers a concern, the applicant is to prepare a remedial action plan.

Here, as elsewhere in the SA/DEIS, the mitigation is inadequate. First, because feasible minimization of the Project impact, that is, adopting the Dry Cooling Alternative, was not done. Second, because both the monitoring and mitigation are too vague. Third, because there is potential for the monitoring to be discontinued at some unknown time, and the reviewer has no information as to when or why this should be permitted.[7] Fourth, because the trigger for remedial action is not only an abnormal lowering of the water table, but also a "decline in plant vigor," which is vague and subjective, and may not occur until it is too late to remediate.[8] And fifth, because the remedial action, presumably some sort of artificial irrigation or creation of artificial wildlife waters, may be infeasible, ineffective, prohibitively expensive, or have unintended impacts of its own. SA/DEIS C.2-202.

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[6] Personal communication, Worley-Parsons consultant to Joan Taylor on Genesis project site field trip Jan, 2010.

[7] "If the monitoring described in BIO-25 detects declining spring water tables—in any amount greater than the normal year-to-year variability—combined with a decline in plant vigor in groundwater dependent vegetation at the Project Monitoring Sites" SA/DEIS C.2-202

[8] "If, after review of the annual monitoring data described in BIO-25 and in Soil & Water- 5, the CPM and BLM's Authorized Officer agree, monitoring measurements and frequencies may be revised or eliminated." SA/DEIS C-2-202.

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Additionally, the existing baseline condition at McCoy Spring, an important wildlife water identified as potentially affected by the Project, is not adequately described; the only information on it was gathered half a century ago.[9]

In conclusion, the SA/DEIS must revise the Soils and Water analysis to provide reliable information, analysis and avoidance/mitigation for impacts of the Project's massive proposed groundwater use. We urge adoption of the Dry Cooling Alternative to substantially reduce Project water use, water waste, and significant potential impacts to groundwater resources as well as other associated impacts.

Cultural Impacts Analysis is Unlawfully Deferred

The Project is located at the shoreline of an ancient dry lakebed utilized by Native Americans in the past. SA/DEIS C.3-67. Additionally, the area was used in World War II as part of the Desert Training Center, an important historical resource eligible for NRHP and the CRHR.[10] SA/DEIS C.3-122 But the SA/DEIS acknowledges "Staff had insufficient information to be certain about this relationship. [11] The SA/DEIS admits that development of the Project could have significant cultural impacts because "Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources." SA/DEIS C.3-5, and that "Geo-archaeological studies of the Proposed Project indicate that *the entire area is highly sensitive for buried cultural resources*, particularly on the southern side closer to the Ford Lake." SA/DEIS B.2-35 (emphasis added) Evidently, these resources are likely to lie within two feet of the surface,[12] yet there is no indication that proper investigations were undertaken, or required to be undertaken, to determine the presence of buried cultural materials.

There are other potentially significant cultural impacts. As acknowledged by the

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[9] "McCoy Spring and Chuckwalla Spring are perennial springs; however, there is no information available regarding the discharge quantity for these springs. Published water quality data for McCoy Spring is included in DWR, 1963." SA/DEIS C.9-36.

[10] Construction activity on the main GSEP plant site and the proposed linear alignments is expected to cause the destruction of seven historic-period archaeological sites. Staff determined that these sites were not individually eligible for inclusion in the However, if these sites were associated with the DTC/C-AMA Cultural Landscape, they would be eligible as contributing elements.

[11] Data insufficiencies included site form recording inconsistencies between recorders, seeming incongruities in the co-occurrence of certain can types, and the lack of discussion of possible military uses of some artifacts... Misidentification could have resulted in sites that may date to the DTC/C-AMA era (1942-1944) being incorrectly interpreted as dating to the mid-twentieth century." SA/DEIS C.3-122

[12] the majority of the proposed site footprint is covered in deposits of Holocene age. Staff considers these deposits to have a moderate-to-high potential to contain well preserved, buried cultural materials... these materials would be expected within approximately 2 feet of the modern ground surface." SA/DEIS C.3-64.

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SA/DEIS, the Project would destroy onsite portions of a Prehistoric Trail Network connecting the Colorado River with Ford Dry Lake and other important destinations. SA/DEIS C.3- 67. And the project has yet-to-be-determined potential impacts to Traditional Cultural Properties of significance to Native Americans, such as McCoy Springs,. SA/DEIS C.3-67. In spite of legal mandates to analyze all the above under NEPA and CEQA, the SA/DEIS states that impacts to cultural resources are "undetermined" [13] SA/DEIS ES-20, and that assessment of the short and long term adverse impacts to cultural resources will be completed only in a Programmatic Agreement, development of which "is underway" SA/DEIS ES-21, and that "the resolution of the significant effects of the GSEP would be set forth in a PA." SA/DEIS C.3-119. Thus, on its face the SA/DEIS discussion of impacts to cultural resources is incomplete and inadequate.

The BLM has also failed to satisfy its obligations under section 106 of the NHPA. 16 U.S.C. § 470(f). This section of the NHPA requires agencies to take into account the impact of effects of their actions on historical resources "prior to the issuance of any license." 16 U.S.C. § 470(f). Instead of completing this required process, BLM is opting to use a programmatic agreement to defer evaluation, mitigation, and treatment until after approval and full public review is possible.

Here again, as with other resource issue areas requiring full environmental analysis, the assessment of impacts and the formulation of mitigation measures is impermissibly deferred. CEC plans to fulfill the bulk of its obligations under CEQA by conditioning approval on the applicant's compliance with a programmatic agreement whose contents are not disclosed. SA/DEIS C.3-119. Even though the anticipated mitigation would rely on programs and protocols, the SA/DEIS acknowledges that it does not lay forth the mitigation that would be eventually be employed.[14]. This abdication of responsibility is clearly a violation of statutes enacted to ensure public participation in informed decision-making and to protect our nation's irreplaceable cultural heritage. Before committing to the permanent destruction of irreplaceable cultural resources for the sake of a temporary project, CEC and BLM must, at the very least, determine and disclose the nature and extent of the cultural heritage they are obliterating.

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[13] At C.3-1 the SA/DEIS is internally inconsistent on this point, asserting: "Staff concludes that the proposed Genesis Solar Energy Project (GSEP) would have a significant direct impact on 14 historically significant archaeological resources and a potential significant indirect impact on 1 ethnographic resource."

[14] Specific mitigation measures for the eligible and assumed-eligible cultural resources will be developed through the PA consultation process, so what staff presents below are *some general ideas* of what mitigation measures could eventually be included in the PA. *The list below is neither complete nor exhaustive.*" SA/DEIS C.3-119 (emphasis added)

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The Analysis of Impacts to Sensitive Animals, Plants, and Other Biological Resources is Inadequate

The SA/DEIS analysis of biological impacts of the Project is replete with instances where surveys have not yet been conducted and mitigation has not been formulated, and yet the SA/DEIS maintains that "The absence of the 2010 survey data has not precluded staff from coming to conclusions about the significance of potential impacts to biological resources or prevented development of appropriate mitigation." SA/DEIS C.2- 6. This conclusion is flatly contrary to NEPA/CEQA requirements to provide full information to the public and decision makers, a gross deficiency which is discussed more fully above.

Desert Tortoise

The Project site lies within a broad alluvial plain which drains the Palen Mountains to the north. SA/DEIS C.2-1. The SA/DEIS considers the entire Project site to be suitable habitat for tortoise. SA/DEIS C.2-34. It contains 23 acres of designated critical habitat for desert tortoise, which will be mitigated at a ratio of 5:1, and 1763 acres of suitable habitat which is proposed to be mitigated at a ratio of 1:1. SA/DEIS c.2-1. This mitigation, however does not account for indirect impacts to tortoise of predation, road kill, harassment, etc.

The desert tortoise in and around the Project site are part of the Eastern Colorado Recovery Unit. SA/DEIS C.2-14. Desert tortoise recovery plans emphasize that activities occurring outside the boundaries of existing tortoise conservation areas can negatively affect tortoise populations.[15] Both the 1994 and draft 2008 Tortoise Recovery Plans recommend that land managers focus recovery efforts toward tortoise conservation areas; however, the Plans also emphasize that land managers should try to limit the loss of habitat outside conservation areas as much as possible.[16] The SA/DEIS acknowledges that the proposed project will result in the direct and permanent loss of all occupied tortoise habitat onsite. SA/DEIS C.2-70. Protocol spring surveys on the main project footprint were negative for live animals but indicated past use by tortoise. However the transmission line routing has changed since, and the surveys for the new routing were not adequate. Further surveys are scheduled for Spring 2010. SA/DEIS C.2-33. The results of those surveys are not available in the SA/DEIS.

The SA/DEIS proposes to relocate or translocate ("translocate") desert tortoise found onsite, but it presents no final Desert Tortoise Relocation/ Translocation Plan. SA/DEIS C.2-174. Nor does it adequately mitigate the dangers

[15] See U.S. Fish and Wildlife Service, Draft revised recovery plan for the Mojave population of the desert tortoise (Gopherus agassizii) at 33 (2008).
[16] Id.

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that disease poses to translocated tortoises. Specifically, it does not require adequate disease testing. Relocating tortoise without disease testing could imperil the health of both the animals to be moved and the resident populations into which tortoises will be released.[17] Based on the reports of Berry, et al. (2008), Mack, et al. (2008) and Mack and Berry (2009) that disease is not uniformly distributed across geographical areas, it is reasonable to assume that there will be pockets of diseased animals and pockets of healthy animals within the 5 kilometer range of the project site. Not fully testing animals that are to be "relocated" could result in the introduction of diseases into otherwise healthy populations. Also, as noted by the CDFG, "moving tortoises up to 5 km distance without disease testing presents risks to other populations." SA/DEIS C.2-57. Not testing the host populations within the 5 kilometer range could result in the introduction of healthy tortoises from the project site into a population that is diseased. Therefore, any translocation should follow the Desert Tortoise Council Guidelines for Handling Desert Tortoise During Construction. Additionally, any tortoises that are moved more than 1000' should be fully tested for disease and the host population should be tested to the same extent as well.

The SA/DEIS should be revised to disclose the survey results of the re-routed Project transmission lines and to require full disease testing for tortoise translocation.

Mojave Fringe-toed Lizard

The Mojave fringe-toed lizard (MFTL) is a BLM sensitive species that is found in sandy, hot, sparsely vegetated habitats. SA/DEIS C.2-69. It is restricted to habitats with fine, loose sand. Id. Because it is restricted to these sandy locations, and because of increasing development pressures, its habitat has become highly fragmented. Id. The habitat fragmentation has in turn left the species vulnerable to local extirpations. It is important to protect the fragile sandy ecosystem upon which the Mojave fringe-toed lizard is dependent. Id.

The SA/DEIS acknowledges that of the Project would destroy 66 acres of Mojave fringe-toed lizard habitat, and, by blocking aeolian fluvial and sand transport through the project, indirectly impact 453 acres of habitat downwind of the Project Disturbance Area. C.2-2. It also identifies that cumulative impacts of the Project to this sensitive species are significant and "of particular concern."[18]

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[17] Based on the reports of Berry, et al. (2008), Mack, et al. (2008) and Mack and Berry (2009) that disease is not uniformly distributed across geographical areas, it is reasonable to assume that there will be pockets of diseased animals and pockets of healthy animals within the 5 kilometer range of the project site.

[18] "Of particular concern are the cumulative effects of renewable energy projects within the geographic scope of the Chuckwalla Valley, which contains an isolated system of dunes and population of Mojave fringe-toed lizard. The direct loss of dune habitat and

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However, although the SA/DEIS recognizes the fact that this population of Mojave fringe-toed lizard is at the southernmost extreme of the species' range, it only identifies impacts to the local population and the species in general (SA/DEIS C.2-2). Although the SA/DEIS briefly alludes to the potential for species-level impacts,[19] it fails to fully evaluate the importance of this population to genetic diversity and climate adaptation of the species. With the hotter and drier conditions expected with climate change,[20] the southernmost, lower elevation populations of MFTL are likely better adapted to extremes of heat and aridity than those in the higher, cooler areas of the Mojave desert. SA/DEIS C.2-69, 70. Thus it is essential to conserve the populations at the southern extreme of the species for genetic diversity, species fitness[21] and ability of the species to adapt to climate change stressors. This omission of climate change adaptation analysis is characteristic of the general deficiency as regards this pivotal issue, as more fully discussed below.

The SA/DEIS has an affirmative obligation to analyze an alternative that would avoid significant unmitigated impacts to MFTL, not only because of onsite loss of habitat but also because of offsite impacts to sand flow and potential species-level impacts to MFTL. The project should be realigned and reconfigured to avoid onsite dunes and Aeolian sand transport corridors. Additionally, while the SA/DEIS has analyzed the potential for the various configurations of the Project and its fences to serve as perches for birds of prey, to increase the Project impact to desert tortoise, it has failed to do so for MFTL (and other vulnerable species) outside the Project foot print. This, too, must be remedied.

The SA/DEIS must be revised and pertinent information and analysis on the above, including a feasible alternative to avoid impacts to MFTL and sand transport, must be provided to the public.

Desert Kit Fox and American Badger

Mojave fringe-toed lizard is minor relative to the indirect downwind effects from obstructions within the active aeolian sand transport corridor, and the disruption of the fluvial processes that contribute sand to the system from the diversion of washes – approximately 63 miles of washes within the Ford watershed alone." SA/DEIS C.2-149, 150.

[19] "This southern population may represent an important gene pool in light of the likely warming and drying that will occur in this region as a result of climate change; these southernmost lizards that may already be adapted to hotter and drier conditions than those further north and could represent a source of genetic variation that could stave off extinction of this species in selected refugia (Barrows pers. comm.). SA/DEIS C.2-69, 70.

[20] California Resources Agency *California Climate Change Adaptation Strategy Discussion Draft* 2009 p 4, Figures 5&6

[21] Booy et al, *Genetic Diversity and the Survival of Populations*, 2000

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Desert kit foxes, State-protected Fur-Bearing Mammals, and American Badgers, State Species of Concern, will be destroyed or removed from the project site. SA/DEIS C.2-84. Although the Applicant has not performed focused surveys for these species, there is suitable habitat on site, and several individuals as well as many burrows complexes and scat were observed throughout the site. Id. The SA/DEIS provides no information as to the number of kit foxes that will be affected; although it does acknowledge that kit fox and American badger are sensitive species that must be protected. Id.

Nevertheless, the SA/DEIS provides almost no information as to how impacts to these species will be avoided; there is only a salvage operation proposed. The SA/DEIS suggests that impacts to these animals will be fully mitigated as follows: a preconstruction survey should be done; dens should be flagged, crushed or filled in if not occupied; and that habitat acquired for desert tortoise, wash resources and dunes should suffice as mitigation for these mammals SA/DEIS C.2-64. However, the SA/DEIS offers no assurance that habitat which is to be acquired specifically for desert tortoise and Mojave fringe-toed lizard, will have the primary constituent elements or the necessary carrying capacity for ranging predators such as desert kit fox and American badger. Once again, this analysis is insufficient under NEPA and CEQA as it provides inadequate information for the public or agencies to use in determining the adequacy of proposed mitigation.

The Cumulative Impacts Analysis is Deficient

A discussion of the cumulative environmental effects of a proposed action is an essential part of the environmental review process, otherwise the agency cannot evaluate the combined environmental effect of related actions. Cumulative impact is defined in NEPA's implementing regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions . . . . Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7

Under NEPA, an EIS must provide a sufficiently detailed catalogue of past, present, and reasonably foreseeable future projects, and provide an adequate analysis of how these projects, in conjunction with the proposed action, are thought to have impacted or are expected to impact the environment. See Muckleshoot Indian Tribe v. United States Forest Serv., (9th Cir.1999) 177 F.3d 800, 810 (per curiam) (quoting 40 C.F.R. § 1508.7). In addition to an adequate cataloging of past projects, NEPA also requires a discussion of consequences of those projects. However, the SA/DEIS fails to properly assess and address the severe cumulative biological and other impacts of the project.
Considered in the context of other proposed large energy projects in the region, the

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cumulative impacts of the Project are significant in nearly every issue category. The cumulatively significant biological impacts include Desert washes – Ford Watershed and the broader NECO planning area; Desert tortoise habitat; Golden eagle foraging habitat; Mojave fringe-toed lizard and their habitat; Habitat for American badger, desert kit fox, and burrowing owl; LeConte's thrasher habitat; Couch's spadefoot toad range; Habitat for Harwood's milk-vetch and other dune/playa-dependent special-status plants; Wildlife habitat and connectivity within the Palen-Ford WHMA (for Mojave fringe toed lizard, dunes, and playa); Mojave and Sonoran creosote bush scrub; desert dry wash woodland (microphyll woodland); playa and sand drifts over playa, and dunes (active and stabilized). SA/DEIS C.2-149ff.

Of particular concern are the cumulative effects of renewable energy projects within the geographic scope of the Chuckwalla Valley, which contains an isolated system of dunes and population of Mojave fringe-toed lizard. The direct loss of dune habitat and Mojave fringe-toed lizard is minor relative to the indirect downwind effects from obstructions within the active aeolian sand transport corridor, and the disruption of the fluvial processes that contribute sand to the system from the diversion of washes – approximately 63 miles of washes within the Ford watershed alone.

On a human time scale, these cumulative impacts will be pervasive, causing landscape-level biological, cultural, visual and other impacts that will be permanent or last hundreds of years after the expected lifetime of the Project. The SA/DEIS fails to provide adequate analysis, identification, and mitigation or avoidance of Project cumulative impacts.

Inter alia, the SA/DEIS fails to provide an adequate analysis of how these related projects, in conjunction with the proposed action, are thought to have impacted or are expected to impact the environment. The acreages and intent of the identified related projects are given, but actual cumulative impacts of these projects on the affected environment are not analyzed in adequate specificity. In particular, the cumulative biological context is deficient. The SA/DEIS fails to analyze the threshold questions about the cumulative context: What is the existing condition for the species at risk? What is the expected future condition for the species and biological processes at risk from the cumulative impacts of this and other existing and reasonably foreseeable actions? And what relative contribution to these impacts is the proposed project expected to make?

Clearly, the SA/DEIS has not assembled enough information and performed the requisite analysis (and the responsible agencies do not have adequate planning guidance) to determine: 1) the level of cumulative impacts to habitats, species and ecosystems, especially in the context of likely climate-change-necessitated habitat and species migration, or: 2) the limits of acceptable change; or 3) how to avoid significant cumulative impacts that would foreclose future opportunities to sustain desert ecosystems and species. This is a violation not only of NEPA and CEQA, but of State and Federal mandates requiring sustainable resource protection, such as

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FLPMA and the 2009 California Climate Change Adaptation Strategy (herein incorporated by reference). The latter stated, "In the face of a changing climate it is imperative that Departments work to maintain healthy, connected, genetically diverse populations" to "aids [sic] the movement of species within reserve areas as they adjust to changing conditions associated with climate change." 2009 California Department of Water Resources *Climate Change Adaption Strategy, Discussion Draft*, 56. This guidance document also directed California Department of Fish and Game to ensure that CEQA review addressed climate change issues in this context.[22]

At C2-2ff the SA/DEIS acknowledges that even with mitigation, certain cumulative Project impacts remain significant. To offset cumulative biological impacts to the region,[23] the SA/DEIS proposes new plan designations to designate two new linkage areas and one solar exclusion area. SA/DEIS Biological Resources, Appendix B, p 1-3. In context with the vast land conversion contemplated with renewable energy development, the concept of setting aside landscape-level conservation areas to mitigate for severe cumulative impacts of the project is laudable, and in fact it is mandated by NEPA and CEQA. However, there are some serious deficiencies in the proposed mitigation. Plan amendments can be changed; they are not permanent. The proposed mitigation of only Plan amendments does not provide the necessary permanent, unchangeable mitigation for severe cumulative impacts that will persist at least for hundreds of years beyond the life of the cumulative projects. The mitigation also does not specify management prescriptions, and it allows undefined activities, "Casual use of the area would remain unaffected." SA/DEIS Biological Resources, Appendix B, p3.

As a thorough cumulative impact analysis is required for public and the agencies to make an informed decision regarding the consequences of a proposed action, the SA/DEIS must be revised to thoroughly examine the above-referenced deficiencies.

The Alternatives Analysis is Inadequate Because BLM Unlawfully Rejected Feasible Alternatives

BLM's Statement(s) of Purpose and Need Reflects the Applicant's Needs, and Is Too Narrowly Drawn.

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[22] CEQA Review/Department Guidance – The Department of Fish and Game will initiate the development of internal guidance for staff to help address climate adaptation and to ensure climate change impacts are appropriately addressed in CEQA documents. Id. 61.

[23] "Combined with the effects of historical grazing and military training, agriculture, and highway and aqueduct construction, the proposed wind and solar energy projects have the potential to further reduce and degrade native plant and animal populations." SA/DEIS C.2-111

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The Alternatives Analysis "is the heart of the environmental impact statement."[24] CEQ regulations require that an alternatives analysis presents the environmental impacts of the proposal and the alternatives in comparative form, sharply defining issues and providing a clear basis for choice among options by the decision-maker and the public. 43 CFR § 1502.14. In the SA/DEIS Alternatives Analysis, BLM did not consider the Private Land and other private offsite alternatives under NEPA on the basis that these alternatives would not accomplish the purpose and need of the proposed action. [25]

The decision not to examine these alternatives was incorrect because BLM's statement of purpose and need for the SA/DEIS is too narrowly drawn. Courts have held that although an agency has discretion to define the purpose and need of a project, it cannot use "unreasonably narrow" terms to define a project's objective. The Department of Interior ("DOI") regulation, 40 C.F.R. § 1502.13 merely requires that an EIS briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action. DOI's NEPA handbook explains that the "purpose and need statement for an externally generated action must describe the BLM purpose and need, not an applicant's or external proponent's purpose and need. " Department of Interior, Bureau of Land Management, National Environmental Policy Act Handbook 35 (citing 40 C.F.R. § 1502.13) (emphasis added).

Here, however, in contravention of NEPA guidelines, the BLM only looked to the Applicant's purpose and need. The SA/DEIS stated that the purpose and need is "to respond to Genesis Solar, LLC's application under Title V of Federal Land Policy and Management Act, FLPMA (43 U.S.C. 1761) for a ROW grant to construct, operate, and decommission a solar thermal facility on public lands in compliance with FLPMA, BLM ROW regulations, and other Federal applicable laws." SA/DEIS ES-6. Based on this narrow statement of purpose and need, BLM has declined to examine any private land off-site alternatives (as well as dismissing alternative technologies, distributed generation, energy efficiency and demand response). In so doing, BLM impermissibly rejected reasonable alternatives that resolved most if not all significant biological impacts of the project [26]on the basis of inconsistency with the applicant's purpose and need. Moreover, BLM did so in spite of numerous scoping comments requesting consideration of a private/disturbed land alternative.[27]

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[24] 40 C.F.R. § 1502.14.

[25] "since the proposed actions under review in this document are whether to approve or deny, or approve with modification an application for the Calico Solar project to be sited on public land, analysis of a private land alternative would not be consistent with the stated purpose and need of the proposal." SA/DEIS B.2-18.

[26] "The Gabrych Alternative site is preferred over the proposed GSEP site for six resource elements: recreation and wilderness, soils and water, worker safety and fire protection, biology, and cultural resources. SA/DEIS B.2-52.

[27] SA/DEIS ES-9ff.

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As the Energy Policy Act, and related Secretarial and Executive Orders direct BLM to "encourage the development of environmentally responsible renewable energy" while complying with existing environmental laws, – the project purpose and need statement need not be so narrowly drawn as to preclude the consideration of alternative locations and technologies. To do so reflects the needs of the project applicant, not the needs of BLM, in violation of NEPA. In fact, an agency's refusal to consider an alternative that would require some action beyond that of its congressional authorization is counter to NEPA's intent to provide options for agencies. See 40 C.F.R. 1502.14. BLM's decision to narrow its purpose and need to preclude the analysis of alternative sites, and to avoid analysis of offsite alternatives because they are outside of its jurisdiction, renders the SA/DEIS deficient.

The Cumulative Impacts Analysis Is Deficient

A discussion of the cumulative environmental effects of a proposed action is an essential part of the environmental review process, otherwise the agency cannot evaluate the combined environmental effect of related actions. Cumulative impact is defined in NEPA's implementing regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions . . . . Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7

Under NEPA, an EIS must provide a sufficiently detailed catalogue of past, present, and reasonably foreseeable future projects, and provide an adequate analysis of how these projects, in conjunction with the proposed action, are thought to have impacted or are expected to impact the environment. See Muckleshoot Indian Tribe v. United States Forest Serv., (9th Cir.1999) 177 F.3d 800, 810 (per curiam) (quoting 40 C.F.R. § 1508.7). In addition to an adequate cataloging of past projects, NEPA also requires a discussion of consequences of those projects. However, the SA/DEIS fails to properly assess and address the severe cumulative biological and other impacts of the project.

Considered in the context of other proposed large energy projects in the region, the cumulative impacts of the Project are significant in nearly every issue category. On a human time scale, these cumulative impacts will be pervasive, causing landscape-level biological, cultural, visual and other impacts that will be permanent or last hundreds of years after the expected lifetime of the Project. The SA/DEIS fails to provide adequate analysis, identification, and mitigation or avoidance of Project cumulative impacts.

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Inter alia, the SA/DEIS fails to provide an adequate analysis of how these related projects, in conjunction with the proposed action, are thought to have impacted or are expected to impact the environment. The acreages and intent of the identified related projects are given, but actual cumulative impacts of these projects on the affected environment are not analyzed in adequate specificity. In particular, the cumulative biological context is deficient. The SA/DEIS fails to analyze the threshold questions about the cumulative context: What is the existing condition for the species at risk? What is the expected future condition for the species and biological processes at risk from the cumulative impacts of this and other existing and reasonably foreseeable actions? And what relative contribution to these impacts is the proposed project expected to make?

Clearly, the SA/DEIS has not assembled enough information and performed the requisite analysis (and the responsible agencies do not have adequate planning guidance) to determine: 1) the level of cumulative impacts to habitats, species and ecosystems, especially in the context of likely climate-change-necessitated habitat and species migration, or: 2) the limits of acceptable change; or 3) how to avoid significant cumulative impacts that would foreclose future opportunities to sustain desert ecosystems and species. This is a violation not only of NEPA and CEQA, but of State and Federal mandates requiring sustainable resource protection, such as FLPMA and the 2009 California Climate Change Adaptation Strategy (herein incorporated by reference). The latter stated, "In the face of a changing climate it is imperative that Departments work to maintain healthy, connected, genetically diverse populations" to "aids [sic] the movement of species within reserve areas as they adjust to changing conditions associated with climate change." 2009 California Climate Change Adaptation Strategy, 56. This guidance document also directed California Department of Fish and Game to ensure that CEQA review addressed climate change issues in this context.[28]

At C.2-6ff the SA/DEIS acknowledges that even with mitigation, certain Project impacts remain cumulatively significant. More importantly, in this, and every SA/DEIS, the agencies acknowledge that impacts from the limited set of identified present and future renewable projects are likely to remain cumulatively considerable even after the projects are mitigated. SA/DEIS C.2-150.

To offset cumulative biological impacts to the I-10 region, the SA/DEIS proposes new plan designations to designate two new linkage areas and one solar exclusion area. SA/DEIS Appendix B, 1-3. In context with the vast land conversion contemplated with renewable energy development, the concept of setting aside landscape-level conservation areas to mitigate for severe cumulative impacts of the project is laudable, and in fact it is mandated by NEPA and CEQA. However, there are some serious deficiencies in the

[28] CEQA Review/Department Guidance – The Department of Fish and Game will initiate the development of internal guidance for staff to help address climate adaptation and to ensure climate change impacts are appropriately addressed in CEQA documents. Id. 61.

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proposed mitigation. Plan amendments can be changed; they are not permanent The proposed mitigation of only Plan amendments does not provide the necessary permanent, unchangeable mitigation for severe cumulative impacts that will be permanent or persist at least for hundreds of years beyond the life of the projects. The mitigation also does not specify management prescriptions, and it allows undefined activities, "Casual use of the area would remain unaffected." (Biological Resources, Appendix B-3)

Since a thorough cumulative impact analysis is required for public and the agencies to make an informed decision regarding the consequences of a proposed action, the SA/DEIS must be revised to thoroughly examine the above-referenced deficiencies.

BLM Does Not Adequately Analyze the Project Under the Requirements of FLPMA and the CDCA

The Federal Land Policy and Management Act (FLPMA) was enacted in 1976 in part to ensure that public lands are:

> managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will pro-vide for outdoor recreation and human occupancy and use.

43 U.S.C. 1701.

Recognizing that the California desert is a rare and special place, Congress designated a large portion of the Southern California desert as the California Desert Conservation Area (CDCA). 43 U.S.C. § 1781(c). Congress understood that "the California desert environment is a total ecosystem that is extremely fragile, easily scarred, and slowly healed." 43 U.S.C. § 1781(a)2. Accordingly, FLPMA required the preparation and implementation of the CDCA Plan, " a comprehensive, long-range plan for the management, use, development and protection of these lands " 43? U.S.C. § 1781(b) The purpose outlined in the CDCA Plan is to provide for "multiple use and sustained yield, and the **maintenance of environmental quality.**" 43 U.S.C 1781(b).

With this understanding came the mandate to the BLM that they should "take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C § 1732(b). To ensure the overall maintenance of environmental quality, the CDCA Plan should provide a desert-wide perspective of the planning decisions for each major resource or issue of public concern. Since the CDCA Plan was completed

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in 1980, there has been only one major amendment affecting this portion of the Colorado desert, the Northern and Eastern Colorado Management (NECO) Plan in 2002. But neither the NECO amendment nor the CDCA Plan contemplated cumulative industrial development, which could be as high as 500,000 to 1,000,000 acres as reflected in renewable energy development applications on public land in the California desert. Thus, there is no desert-wide planning perspective for land conversion of this scale and intensity. The Project alone entails three square miles of industrialization, with attendant loss of all biological resources onsite, all habitat connectivity through the project and immediate environs, loss of all public access, all visual resources, all recreational value, etc. Here also, the proposed CDCA Plan Amendment does not take into account a desert-wide perspective; rather it simply proposes that "[p]ermission [is] granted to construct solar energy facility (proposed Genesis Solar Project)." SA/DEIS A-7. Moreover, this action is proposed without any appropriate planning level guidance.

The Project is located in public lands that are designated as Class L. According to the CDCA Plan, "[m]ultiple-Use Class L (Limited Use) protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished." CDCA Plan 13. As such, the Plan should not be amended to allow for large scale industrial development unless "sensitive values are not diminished." Here, however, this project will cause a long-term loss of valuable resources, sensitive plants, and protected species. In nearly every important public land resource category--biological, cultural, land use, recreation, visual, wilderness ,soils, water, etc.--the project has severe impacts, some of which are acknowledged by the SA/DEIS and some of which the SA/DEIS has failed to identify.

Under FLPMA BLM must "[prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values." The inventory must be kept current "so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. § 1711(a). FLPMA requires that this inventory form the basis of the land use planning process. 43 U.S.C. § 1701(a)(2). In *ONDA v. Rasmussen,* (D.Or. 2006) 451 F.Supp. 2d 1202, 1212-13, the court held that BLM had failed to satisfy the "hard look" requirement of NEPA because they relied on outdated inventories, in violation of FLPMA. *See also Center for Biological Diversity v. Bureau of Land Management*, 422 F.Supp.2d 1115, 1166-67 (N.D. Cal. 2006). Here too, BLM is violating its mandate by proposing a one-sentence Plan Amendment without adequately identifying the species and resources that will be affected by the Amendment.

As discussed in the earlier part of the comment letter, specifically Biological Resources, BLM has failed to adequately characterize the public lands and resources that will be affected by the Project. These include, but are not limited to, the desert tortoise, Mojave fringe-toed lizard, and multiple resources impacted by potential groundwater issues and flooding concerns. Multiple areas of the SA/DEIS state that

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surveys are still ongoing or are concurrent with the public comment period; not only is deferral of surveys contrary to NEPA, but it also violates the BLM's responsibilities under FLPMA and the CDCA. Under FLPMA BLM must "take any action necessary to prevent unnecessary or undue degradation of the lands" and "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §§ 1732(b), 1732(d)(2)(a). Here, however, the SA/DEIS does not adequately address the consequences associated with translocating threatened desert. These vital data gaps illustrate that BLM cannot adequately show that they are preventing unnecessary degradation of public lands.

Further, FLPMA requires that when the BLM is amending a land use plan, they must "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences . . . consider the relative scarcity of the values involved . . ." 43 U.S.C. § 1712(c). Here, the SA/DEIS has not assembled enough information and analysis and the responsible agencies do not have adequate guidance to determine: 1) the level of cumulative impacts to habitats, species and ecosystems, especially in the context of likely climate-change-necessitated habitat and species migration; 2) the limits of acceptable change, or; 3) how to avoid significant cumulative impacts that would foreclose future opportunities to sustain desert ecosystems and species.

Additionally, BLM does not look into any alternative plan amendments, and appears to have looked at this amendment in isolation. However, under CDCA requirements, the BLM must determine "if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification . . . " and evaluate "the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection." CDCA Plan 121. As discussed below, the SA/DEIS does not adequately examine alternatives to the Project, and neglects to perform a thorough cumulative impact analysis. As the CDCA was designed to provide broad, **regional** guidance (CDCA Plan 11), the BLM should examine this project not only as to the effects on the Western Mojave, but also on the Mojave ecosystem and the CDCA as a whole. Without this analysis the overarching planning principles inherent in FLPMA and CDCA will be undermined. As such, this CDCA Plan Amendment should not be approved until the missing information is provided and the BLM provides a region-wide assessment per CDCA and FLPMA.

Conclusion

For these reasons, the SA/DEIS violates NEPA, CEQA and potentially FLPMA. Accordingly, it should be revised and re-released. Also, the CDCA and NECO Plans should

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be revised to give desert-wide guidance, prior to approval of the substantial public land conversion currently proposed by renewable energy projects. In terms of specific local impacts, we would urge adoption of the Dry Cooling Project Alternative, reduced or reconfigured to avoid impacts to groundwater resources and Aeolian sand source for dunes that support Mojave fringe-toed lizard. Additionally, we urge full identification, analysis and mitigation for likely Project caused impacts to important cultural resources on the ancient shoreline of Ford Dry Lake.

Thank you for the opportunity to comment on this important project.

Very truly yours,

Joan Taylor

Joan Taylor, Chair
California/Nevada Desert Energy Committee
Sierra Club
1850 Smoke Tree Lane
Palm Springs, CA 92264

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"Michael J. Connor"
<mjconnor@westernwatersheds.org>
07/08/2010 04:17 PM

To CAPSSolarNextEraFPL@blm.gov, Mike Monasmith <mmonasmi@energy.state.ca.us>
cc
bcc
Subject Genesis Ford Dry Lake Solar Energy Project DEIS

Dear Ms. Shaffer and Mr. Monasmith:

Attached are Western Watersheds Project's comments on the Genesis (NextEra - Ford Dry Lake) Solar Energy Project Staff Assessment/Draft Environmental Impact Statement. Comments are due today.

Could you please respond to this email to confirm that you received and could open the attached file?

Thank you.

Michael Connor

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****
Michael J. Connor, Ph.D.
California Director
Western Watersheds Project
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Reseda, CA 91337-2364
(818) 345-0425
http://www.westernwatersheds.org
****

07-08-10-WWPCommentsGenesisFordDryLakeSolarDEIS.pdf

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Working to protect and restore Western Watersheds

July 8, 2010

By Email

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California Energy Commission,
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Sacramento, CA 95814
Attn: Mike Monasmith, Project Manager,
< mmonasmi@energy.state.ca.us >

Re: GENESIS SOLAR ENERGY PROJECT STAFF ASSESSMENT/DRAFT ENVIRONMENTAL IMPACT STATEMENT

Dear Ms. Shaffer and Mr. Monasmith:

On behalf of Western Watersheds Project and myself, please accept the following comments on the Draft Environmental Impact Statement ("EIS") for the Genesis (NextEra - Ford Dry Lake) Solar Energy Project.

Western Watersheds Project works to protect and conserve the public lands, wildlife and natural resources of the American West through education, scientific study, research, public policy initiatives, and litigation. Western Watersheds Project and its staff and members use and enjoy the public lands, including the lands at issue here, and its wildlife, cultural and natural resources for health, recreational, scientific, spiritual, educational, aesthetic, and other purposes. Western Watersheds Project submitted scoping comments for this project on December 23, 2009.

The Bureau of Land Management ("BLM") is considering a possible plan amendment for a right-of-way (ROW) authorization filed by NextEra, LLC to develop an 1,800-acre, 250-megawatt (MW) solar generation facility, including a substation, administration facilities, operations and maintenance facilities, evaporation ponds, surface storm water control facilities, and temporary construction lay-down areas. The project is located approximately 25 miles west

of the city of Blythe, California, on BLM-managed lands. The project area is south of Palen/McCoy Wilderness Area and north of Ford Dry Lake.

This project will have significant direct, indirect and cumulative impacts on some of the desert's most sensitive resources including species listed under the Endangered Species Act such as desert tortoise and on important cultural resources. The DEIS is a rushed incomplete document that does not take NEPA's requisite "hard look" at the environmental impacts. Specific issues of concern that are inadequately addressed in the DEIS are summarized as follows:

(1) Range of Alternatives.

The NEPA implementing regulations specify that NEPA documents must analyze a full range of alternatives. Based on the information and analysis presented in the sections on the Affected Environment (40 C.F.R. § 1502.15) and the Environmental Consequences (40 C.F.R. § 1502.16), the NEPA document should present the environmental impacts of the proposed action and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public

We had proposed that the BLM consider a number of alternatives, including the following:

(a) "No Action Alternative" as is required by NEPA.
(b) Alternative sites on public lands with fewer cultural resource conflicts.
(c) Alternative that features technology that requires significantly less water.
(d) A private lands alternative under which the project is built on private lands only.
(e) A distributed energy alternative using "roof top" solar to avoid the need for construction of a power plant.

The BLM has ignored the three alternatives that would avoid the impacts to the resources at the project site and would conform with FLPMA's mandate that the BLM avoid the unnecessary and undue degradation of public lands i.e. (b) Alternative sites on public lands with fewer cultural resource conflicts; (d) A private lands alternative under which the project is built on private lands only; and, (e) A distributed energy alternative using "roof top" solar to avoid the need for construction of a power plant.

(2) Desert Tortoise.

The Project would impact 1,786 acres of desert tortoise habitat, including 23 acres within the Chuckwalla Desert Critical Habitat Unit. Construction and operation of the Genesis Project would therefore require state and federal endangered species "take" authorization. In addition to direct loss of habitat the Project would fragment and degrade adjacent native plant and wildlife communities, and could promote the spread of invasive non-native plants and desert tortoise predators such as ravens. DEIS at C.2-1 The project will require construction of 1.6 miles of access road, 2.8 miles of transmission line route, and 1 mile of gas line route within desert tortoise critical habitat. Approximately 0.5 mile of the proposed transmission line is within the

Chuckwalla Desert Wildlife Management Area ("DWMA") that was designated under the NECO Plan Amendment to the CDCA Plan.

The proposed project site is in California's Colorado Desert within the Eastern Colorado Desert Tortoise Recovery Unit as designated in the 1994 Desert Tortoise (Mojave Population) Recovery Plan. The latest report from the Desert Tortoise Recovery Office cites a 37% decrease in tortoise density in the Eastern Colorado Recovery Unit between 2005 and 2007.[1] In our scoping comments we raised the concern that the project would disrupt connectivity between the Eastern Colorado Recovery Unit and the Northern Colorado Recovery Unit. This could reduce gene flow and impair desert tortoise recovery.

The DEIS takes the position outlined in the *Draft* (i.e. not final) revised recovery plan that California's Colorado Desert desert tortoise population be treated as a single recovery unit. This is a scientifically controversial position since there is data indicating that tortoises from the 1994 Northern and Eastern Colorado Recovery Units are discernible using genetic analysis (see Murphy et al, 2007[2]). However, whether or not there is a scientific basis for the 1994 recovery units being combined into a single recovery unit the issue of loss of connectivity remains. This has not been addressed in the DEIS.

Maintaining connectivity is important especially given the threats posed by global climate change. As the USFWS 2008 Draft Revised Recovery Plan notes,

> Climatic regimes are believed to influence the distribution of plants and animals through species-specific physiological thresholds of temperature and precipitation tolerance. Warming temperatures and altered precipitation patterns may result in distributions shifting northward and/or to higher elevations, depending on resource availability (Walther et al. 2002). We may expect this response in the desert tortoise to reduce the viability of lands currently identified as "refuges" or critical habitat for the species. (USFWS 2008 at 133)

The NEPA documents must fully describe, clearly characterize and identify the direct, indirect, and cumulative effects of each alternative on desert tortoises if the agencies are to satisfy NEPA's requisite "hard look" at the environmental effects of this project. The proposed evaporation ponds could lead to increased numbers of predatory ravens, coyotes, and other subsidized predators in the area. Desert tortoises will also be impacted by this project if OHV riders displaced from the Ford Dry Lake recreation area move to areas with higher desert tortoise values. These indirect effects could impair recovery in the adjacent Chuckwalla DWMA.

(3) Mojave Fringe-toed Lizard.

A number of sensitive species of wildlife and rare plants occur on the project or in the vicinity including the Mojave fringe-toed lizard. The Project will impact sand transport. Disruption of this ecological process will have potentially serious impacts on the Mojave fringe-

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[1] USFWS. 2009. Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2007 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada.

[2] Murphy, R. W., Berry, K. H., Edwards, T. and Mcluckie, A. M. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology. 6(2): 229–251.

toed lizard. The FLPMA precludes the BLM from authorizing projects that will result in undue degradation and the BLM is also precluding from authorizing actions that could propel the listing of this sensitive species under the Endangered Species Act. The DEIS should be revised to take a hard look at impacts to the Mojave fringe-toed lizard and explain the minimization and avoidance measures that will adopted if this project is approved that will reduce impacts to sand transport to less than significant.

(4) Rare Plants.

The DEIS failed to adequately analyze impacts to special-status plants. Harwood's milk-vetch (CNPS List 2.2) and desert unicorn plant (CNPS List 4.3) were identified in the Project Disturbance Area and ribbed cryptantha (CNPS List 4.3) and Las Animas colubrina (CNPS List 2) were identified in the buffer area and outside of the Project Disturbance Area. However, the surveys were incomplete "One segment of the proposed Project linears was not included in spring 2009 surveys, and the Applicant has proposed surveys of this area in 2010. In addition to the species included on the target list for 2009 surveys, staff has identified additional species to include in the spring 2010 survey." DEIS at C.2-3.

Invasive plants and weeds are threats to native habitat, rare plants, and sensitive species. They pose an immense fire hazard. Using chemicals to kill weeds requires exposing the environment, species, and watershed area to a toxic substance which can be the source of further damage to environmental and human health. Manual weed control requires much human effort, machinery, and can cause even more disturbance, leading to erosion, disturbance, and, in some cases, more weeds. The EIS should carefully consider how invasive plants and weeds will be manages and controlled.

(5) Cultural & Paleontological Resources.

The Mojave Desert is rich in structures and artifacts of significant cultural value that are irreplaceable once lost and this particular project is located in a particularly archeologically rich area. The areas around dry lake beds are particularly rich in archaeological sites. The Ford Dry Lake area is a particularly important region with significant archaeological sites. According to the DEIS,

> The proposed Genesis Solar Energy Project (GSEP) would have a significant direct impact on 14 historically significant archaeological resources and a potential significant indirect impact on 1 ethnographic resource. These resources include eight prehistoric-to-historic-period Native American archaeological sites, two of which are potential contributing elements to the prehistoric cultural landscape herein referred to as the Prehistoric Trails Network (PTN) Cultural Landscape; six sites that are potential contributing elements to a historic-period cultural landscape (historic district), herein referred to as the World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) Cultural Landscape; and the ethnographic resource referred to herein as McCoy Spring National Register District (McCoy Spring). DEIS at C.3-1

However, the cultural surveys and analysis are incomplete. For example, the DEIS states, "the impacts to possible Traditional Cultural Property (TCP) McCoy Spring National Register District have not yet been determined." DEIS at C.3-2.

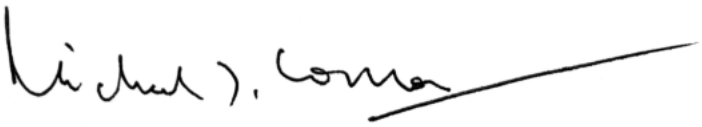
The BLM must take a hard look at the direct, indirect, and cumulative effects of the proposed project on all affected cultural resources.

(6) Water Issues.

We commented in our scoping comments on the need for the EIS to provide information on the water needs of the project and the source of these waters. The DEIS identifies the water source as the adjudicated Colorado River. The SA/DEIS concludes, "the Project has the potential to divert Colorado River water without any entitlement to the water, and all groundwater production at the site could be considered Colorado River water." DEIS at C.9-47. Absent an entitlement this is obviously not a certain and reliable source of water. Nor does the DEIS explain the source and mechanisms for replacement water.

Western Watersheds Project thanks you for the opportunity to submit comments on the DEIS for this proposed solar plant project. Please keep Western Watersheds Project on the list of interested public for this project. If we can be of any assistance or provide more information please feel free to contact me by telephone at (818) 345-0425 or by e-mail at <mjconnor@westernwatersheds.org>.

Yours sincerely,



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07/09/2010 09:13 AM

To CAPSSolarNextEraFPL@blm.gov
cc Andrea_Compton@nps.gov, Curt_Sauer@nps.gov, George_Turnbull@nps.gov, Carol_McCoy@nps.gov, David_A_Reynolds@nps.gov, Alan_Schmierer@nps.gov,
bcc
Subject Fw: JOTR Comments on Genesis/Ford Dry Lake

Attached is a revised letter from the comments from Joshua Tree National Park on the Staff Assessment and Draft Environmental Impact Statement for the Genesis Solar Power Plant. Please accept these comments in lieu of the letter submitted yesterday. A copy is arriving via postal mail.

We have changed one sentence to more accurately reflect the park's perspective of the potential impacts (the last sentence of the paragraph before the "Water Resources" section).

Thank you.
Andrea Compton(See attached file: Genesis Solar Power Plant NPS comments.PDF)
****

Andrea K. N. Compton
Chief of Resources
Joshua Tree National Park

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----- Forwarded by Andrea Compton/JOTR/NPS on 07/09/2010 09:07 AM -----

Cheri Vocelka/JOTR/NPS
07/08/2010 03:28 PM

To CAPSSolarPalen@blm.gov
cc Andrea Compton/JOTR/NPS@NPS, Curt Sauer/JOTR/NPS@NPS, George Turnbull/OAKLAND/NPS@NPS, Carol McCoy/DENVER/NPS@NPS, David A Reynolds/OAKLAND/NPS@NPS, Alan Schmierer/OAKLAND/NPS@NPS
Subject JOTR Comments on Genesis/Ford Dry Lake

Attached are the comments from Joshua Tree National Park on the Staff

Assessment and draft Environmental Impact Statement for the Genesis Solar Power Plant.

Cheri Vocelka
Program Assistant
Joshua Tree National Park
760-367-5502

"Unless someone like you cares a whole awful lot,
Nothing is going to get better. It's not." --Dr. Seuss

[attachment "Genesis Solar Power Plant.PDF" deleted by Andrea Compton/JOTR/NPS] Genesis Solar Power Plant NPS comments.PDF

United States Department of the Interior

NATIONAL PARK SERVICE
Joshua Tree National Park
74485 National Park Drive
Twentynine Palms, California 92277-3597

IN REPLY REFER TO

L7619 (JOTR-RM)

July 8, 2010

Allison Shaffer, Project Manager
Palm Springs - South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, California 92262

COMMENTS ON THE STAFF ASSESSMENT AND DRAFT ENVIRONMENTAL IMPACT (SA/DEIS) STATEMENT, GENESIS SOLAR POWER PLANT, Application For Certification (09-AFC-8), March 26, 2010

Dear Ms. Shaffer:

Joshua Tree National Park, National Park Service (NPS), appreciates the opportunity to provide comments on the above noted document. The proposed Genesis (aka Ford Dry Lake) Solar Power Project is located approximately 18 miles east of the southern portions of Joshua Tree National Park.

We commend the Bureau of Land Management (BLM) for its cooperative approach with the State of California Energy Commission (CEC) to jointly evaluate the environmental implications of the Genesis Solar Power Project. Joshua Tree National Park is supportive of the proposed land use plan alterations to the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) in the Pinto-Basin-Chuckwalla Desert Wildlife Management Area (DWMA), Palen Dunes Exclusion Area, and Palen Wilderness-Chuckwalla DWMA Wildlife Linkage Area. The NPS recognizes and commends the objectives to preserve connected physical attributes and habitat to link populations of a wide diversity of organisms, both flora and fauna. These areas, as mentioned in the DEIS would also offset some of the cumulative effects from this and other projects proposed for the area.

To further enhance the protection of the region's sensitive wildlife and vegetation resources, the NPS recommends the following expansions to incorporate BLM lands in proximity to these areas:

- Pinto Basin-Chuckwalla DWMA Tortoise Linkage Area: include BLM lands west of Highway 177 and south and southwest of the Coxcomb Mountains, to more effectively link the habitat from the Chuckwalla DWMA to habitat to the north.
- Palen Dunes Exclusion Area: include BLM lands to the north and northwest of this area, on both sides of Highway 177 in the Palen Valley, to encompass additional habitat and the dunes and playas.
- Palen Wilderness-Chuckwalla DWMA Wildlife Linkage Area: include BLM lands east and south of Highway 177, north of I-10, and west of the Palen Mountains, to more effectively protect the sand dunes, habitat for the desert tortoise, and cultural sites.

In addition, the NPS suggests that the designations of "Solar Exclusion" areas for Palen Dunes and Palen Wildernenss/Chuckwalla DWMA Linkage be changed to match that of the Pinto-Basin-Chuckwall Tortoise Linkage to be defined as Right-of-Way (ROW) Exclusion. It is our interpretation that this ROW exclusion would limit future applications for projects in the areas, while the Solar Exclusion designation allows for additional projects which do not have major ground disturbing activities, but which could include additional public utility-scale use of these areas. To facilitate the best preservation of habitat and for other reasons stated in the DEIS, additional disturbances should be minimized rather than allowing partial development which requires some evaluation for the interpretation of the definition of "major" ground disturbing activities.

The NPS continues to have significant concerns about the analysis in the DEIS of the potential individual and cumulative impacts to groundwater resources in the Chuckwalla Valley Groundwater Basin and with the adequacy of the cumulative impact analysis in general. Impacts to water resource as a result of this project are anticipated to be mitigatable, but the document then also states that cumulative groundwater extraction will put the basin into overdraft condition. In our specific comments below, we provide detailed discussion and suggestions on ways to improve the DEIS.

The NPS reiterates its request submitted in its scoping comments on the Solar Energy Development Programmatic Environmental Impact Statement (dated 11/30/09), that the area west of the Palen Mountains be removed from consideration for public utility-scale development projects. The DEIS states that the Genesis project alone will result "in a substantial adverse cumulative impact to existing scenic resource values as seen from several wilderness viewing areas" (p.22) and that these impacts cannot be mitigated. These impacts will be magnified for every project that is developed in the Basin and the total cumulative effect has the potential to result in significant adverse impacts to the area's air quality, viewsheds, wilderness values, and night sky qualities. The impacts cumulatively are incompatible with trying to maintain the existing experiences that visitors have on the eastern portions of the park.

Specific resource comments follow.

Water Resources

The significance criteria used to evaluate the potential impact to groundwater resources are broadly and/or incompletely defined. The NPS recommends that the CEC and BLM better define the thresholds and significance criteria used to evaluate individual and cumulative impacts to groundwater resources in the Chuckwalla Valley groundwater basin. For example, in the second bulleted item on page C.9-4 of the SA/DEIS, does this criterion apply to individual and cumulative impacts, and how are "*substantial depletion*" and "*substantial interference*" to be interpreted from one solar project to another? Terms like "*substantial*", "*significant*", and "*considerable*", unless constrained by quantitative (i.e., numerical) limits or bounds, are open to broad interpretation, which leads to confusion.

On pages C.9-46 and C.9-71, how is "*a significant percentage of the total amount of groundwater in storage*" defined? No quantitative, percentage value has been identified by which the reader can understand the agencies' intent of significance. Furthermore, there is little or no discussion on how the groundwater storage value of 15,000,000 acre-feet was derived. A more conservative estimate of 9,100,000 acre-feet was estimated and proposed for groundwater storage in the basin by Eagle Crest Energy for their groundwater pumped storage

project. However, it is unclear whether either of these two storage estimates represents the total amount of water in storage versus the recoverable amount of water in storage, which is a smaller portion of the total amount of water in storage. For example, assuming a total amount of water in storage of 15,000,000 acre-feet and using the average aquifer storage (i.e., drainable porosity) values of 0.05 and 0.0002 reported for the alluvium and the Bouse Formation in Soil & Water Table 9 (page C.9-30), the recoverable amount of water in storage would be reduced to 750,000 acre-feet and 3,000 acre-feet, respectively. For the analysis, the recoverable amount of water in storage should be utilized to evaluate whether or not "*a significant percentage of the total amount of groundwater in storage*" has been exceeded. If both of these total storage estimates prove to be recoverable storage estimates, the NPS suggests using the more conservative value (9,100,000 acre-feet) so that this and other forthcoming SA/DEIS's and foreseeable groundwater development projects are consistent in their evaluation of potential individual and cumulative impacts produced by these projects. It will be important for the CEC and BLM to utilize a consistent set of hydrologic parameter values (groundwater storage, water balance parameters, etc.) in this and future SA/DEIS's so that the impact evaluations are comparable from one project to another.

On page C.9-72, second paragraph, the statement is made that "*the project's contribution to the cumulative impact to basin balance is less than cumulatively considerable.*" Please elaborate on what is meant by this statement as it is unclear to the NPS. How much is "*cumulatively considerable*" and how do we know when this threshold has been exceeded?

<u>The water balance estimate proposed for the Chuckwalla Valley Basin is not substantiated by the available water level data.</u> In the water balance presented in Table 8 on page C.9-25, the current annual amount of water recharging the basin exceeds the amount of water discharging from the basin by 2,600 acre-feet (representing an overbalance of 23%). If an annual surplus is occurring, then the amount of groundwater stored within the basin should be increasing and one should see evidence of groundwater levels rising over time. To date, no evidence has been presented that water levels are rising in the basin to support this position, with the exception of some water levels suspected to be recovering from known periods of significant groundwater pumping in the basin. As a result of this overbalance, the NPS believes the preliminary analysis understates the potential individual and cumulative impacts that might result in the basin related to the proposed solar project and other reasonably foreseen projects.

Groundwater hydrologists commonly assume that a relatively undeveloped desert basin like the Chuckwalla Valley groundwater basin is in a quasi-equilibrium condition with respect to estimating a water balance for such a basin. Therefore, over a sufficiently long period of time, the amount of water coming into the basin (from precipitation and inflow from other basins) should be closely balanced by the amount of water leaving the basin (from natural evapotranspiration and outflow to other basins). This balance is disturbed when human activity disrupts inflow into the basin and/or the outflow from the basin (e.g., by pumping groundwater). In general, hydrologists have much better control in estimating outflow volumes than inflow volumes, and therefore, the outflow estimate should be used as the ultimate constraint on the water balance for the basin. This is an approach commonly adopted by the United States Geological Survey (USGS) when they conduct water resource investigations in the region.

Assuming a pre-development, quasi-equilibrium condition existed, the NPS believes the water balance inflow estimate should be adjusted downward to more closely match the reported water balance outflow estimate of

11,111 afy. For example, adjusting the annual recharge rate downward to a rate similar to the BLM's and County of Riverside's estimate of 5,600 afy and adjusting the combined subsurface inflow from Pinto Valley and Orocopia Valley to 2,500 afy and 1,700 afy, respectively (values reported in Eagle Crest Energy, 2009), results in an adjusted water balance inflow estimate of 10,431 afy. When compared to the current outflow estimate of 11,111 afy, this adjusted inflow estimate would produce a water balance deficit of 680 acre-feet, or an imbalance of about 6 percent, which is an improvement over the current imbalance. Closer examination of the hydrographs presented for wells 4/17-6C1, 5/17-19Q1, and 5/17-33N1 (see Soil and Water Figure 13), though hard to distinguish at the scale presented in the draft EIS document, suggests that slow declines in the basin groundwater level have been occurring since the 1960s, which is consistent with a deficit in the water balance (i.e., an overdraft condition). Unless it is shown through additional water level analysis that the higher water balance inflow value is justified, the NPS believes a lower inflow value provides a more "conservative" and correct estimate to use in the water balance analysis and subsequent evaluation of impacts to regional water level declines and storage depletion. If the CEC and BLM agree with the NPS's contention, several tables will need to be revised to reflect the updated water balance estimates.

Revise hydrographs on Figure 13 to aid evaluation of long-term water level trends. On page C.9-28, reference is made to Soil and Water Resources Figure 13 and discussion is presented about long-term water level trends in several wells distributed around the Chuckwalla Valley Basin. Please revise the vertical axis scale of the hydrographs presented in Figure 13 so that the reader can discern whether or not a long-term increase or decrease in water levels is occurring in the basin. The current vertical axis scale of the hydrographs makes it nearly impossible to determine these conditions. While stylistically pleasing, a consistent scale of 400 feet of elevational change for each hydrograph is not conducive to detecting changes in water level on the order of several feet. There is nothing preventing the vertical axis scale of each hydrograph from being unique relative to the range of water level change occurring within each hydrograph. Another solution would be to change the vertical axis from groundwater elevation to change in water level so that a smaller scale (e.g., 50 to 100 feet of change) could be developed.

Construction-related water requirements are comparatively high to other foreseeable projects in the valley. Estimates of water demands during the construction phase of the project seem high when compared to other solar projects proposed for the valley. For example, in Table 20 (page C.9-70), the water demands for the Genesis Solar Energy Project are estimated at 2,600 acre-feet for the three year construction period, while the construction water demand for the Palen Solar Power Project (also a parabolic trough project) is estimated at 1,440 acre-feet. The Palen project is larger in its disturbance footprint compared to the Genesis project (2,970 acres vs. 1,800), yet the Genesis project requires almost double the water for construction purposes. When compared to similarly- or larger-sized photovoltaic projects (> 200 Mw) proposed in the valley, the Genesis project uses 50 to 200 times more water during construction, even when photovoltaic projects reportedly require a larger disturbed footprint. According to the table, the Genesis project is the largest user of water during the assumed construction phase when compared to each foreseeable project. Is there a reason for this and can the Genesis project water demands for the construction phase be reduced?

Corrections to Table 21 are needed. Please correct the "Cumulative Project Requirements" and "Net Budget Balance" estimates for Year 2019 in Table 21 on page C.9-72. The values presented are incorrect. Additionally, in the first paragraph on page C.9-72, please correct the numbers quoted in the discussion as they seem to be different from the numbers presented in Table 21. If the CEC and BLM agree with the NPS's

contention in Comment #2 above, this table will need to be revised to reflect the updated water balance estimates.

Expand the discussion on how the individual and cumulative impacts to groundwater levels in the Chuckwalla Valley Basin were determined. In the discussion on page C.9-49 concerning individual impacts resulting from the project, a reference is made to a groundwater model developed by Worley-Parsons that was used to estimate the drawdown impacts between two water-bearing zones, the shallow alluvial zone (Layer 1 in the model) and the deeper Bouse Formation (Layers 11 and 12 in the model). Yet, little or no discussion is provided to give the public confidence in how the model was developed and whether it meets acceptable standards and results for a groundwater model under CEQA/NEPA. If a groundwater model was used to estimate the maximum drawdown that might occur from the Genesis Solar Energy Project, please provide additional discussion on the development and use of this model, including how it was calibrated (steady-state and transient), the results of the different modeling runs, and any sensitivity analyses that were conducted.

Similarly, in the discussion on page C.9-73 of cumulative water level impacts resulting from the proposed solar project and other reasonably foreseeable projects in the basin, a reference is made to a groundwater model used by AECOM which appears to have been developed for the Parker-Palo Verde-Cibola area to evaluate impacts from groundwater pumping on the Colorado River. Is this model different from the Worley-Parsons model noted above or might this be the model developed recently by the USGS and used to define the Colorado River accounting surface? Please provide additional discussion on the origin and use of the model referenced in the discussion as it pertains to this draft EIS, including how it was calibrated (steady-state and transient), and the results of the different modeling runs and sensitivity analyses that were conducted. If this model is different from the Worley-Parsons model, why where two different groundwater models used to assess individual and cumulative effects?

A single Groundwater Level Monitoring and Reporting Plan should be developed and managed for the CVGB. The NPS commends the CEC and BLM for requiring the applicant to comply with the measures stated on pages C.9-96 through C.9-100, in an attempt to evaluate potential individual and cumulative impacts resulting from the proposed project. However, the NPS has concerns as to whether similar measures will be applied to other foreseeable projects in the basin and how this information will be interpreted with respect to the degree of individual and cumulative impacts produced by each potential project. To avoid potential conflicting interpretations of impacts by individual project operators, the NPS recommends that a single Groundwater Level Monitoring and Reporting Plan be developed cooperatively by the appropriate regulatory agencies, solar energy operators and interested stakeholders, and managed and evaluated on a regular basis by an independent, scientifically respected organization such as the California Department of Water Resources or the United States Geological Survey. Funding for developing and implementing the plan should be provided by the applicant and other foreseeable project operators in an equitable manner as a condition of granting their right-of-way and operating permits. This funding would cover costs for installing and monitoring new wells needed in the network, monitoring existing wells in the network, processing and interpreting the water level and water quality data, and report production. Given that much of the basin may be developed as a solar energy study area, it would make more sense to develop and manage one Groundwater Level Monitoring and Reporting Plan and monitoring network for the solar energy study area instead of developing and managing several individual plans and monitoring networks for each project. Several individually managed plans invites several differing interpretations of potential individual and cumulative impacts to the groundwater resources of the hydrologically

connected basins and conflicts concerning who may be responsible for mitigating specific impacts to existing water users in these basins. Utilizing an independent third-party to manage and evaluate the information will provide assurances to existing water users that unbiased science is being utilized to evaluate whether potential impacts are occurring and whether mitigation is necessary.

Air Quality

Mitigation measures to control fugitive dust at the completion of the grading operation and during operations should be addressed. The proposed project will be located in an area identified as containing desert pavements and sandy washes. Competing theories or attempts to rationalize the development of desert pavements is still at the forefront of debate by most experts. However, not in debate is the material type that underlies all desert pavements. The finest soil particles ranging from silt to silty clay underlie all desert pavements. The disruption of large areas of desert pavement during grading, post-grading and for the life of the project is likely to produce fugitive dust storms during mild to moderate wind activity. Heavier sand particles dislodged and transported over short distances by saltation[1], require high winds to become airborne. Fine soil particles do not require high winds to become airborne and are suspended for long periods of time. During high wind events, saltation of larger sand grains over fine particulate landscapes may exacerbate the fugitive dust issue, possibly to a level of complete white-out events downwind from the project.

Impacts from fugitive dust have been addressed during the construction phase of the proposed project. However, controlling fugitive dust during the operational phase of the project should be clearly addressed. Large areas of disturbance, unmitigated for the control of fugitive dust, have the potential to create white-out conditions. Some (or substantial) grading will be required to facilitate the proposed development. Mitigation measures, such as compacting or treating areas to control fugitive dust at the completion of the grading operation should be addressed in the DEIS.

Viewshed/Recreation

The preservation of the viewshed, in effect, visibility, needs to be addressed. As discussed above, fugitive dust will likely be a result of the grading operation and the exposure of fine particulate soils that underlie the desert pavements. The fine particulate soils brought to the surface during grading will remain at the surface for the life of the project creating the potential for long-term fugitive dust impacts. Significant viewshed impacts pose serious problems in other areas (e.g., Owens Valley) where fine particulate soil particles are exposed at the surface by anthropogenic activities.

The DEIS states that the viewshed will be significantly impacted by the proposed project as well as other renewable energy projects in the same vicinity (cumulative impacts). However, the DEIS needs to clearly communicate that in addition to visual impacts associated with fugitive dust, visitors to Joshua Tree National Park will experience some level of viewshed degradation due to the project. These impacts need to be analyzed. The DEIS should include a description of the current view from prominent overlooks in the park looking toward the proposed project area and include detailed maps and photos that clearly define the park and project boundaries. Each of the project alternatives addressing project footprint or equipment design (cooling towers,

[1] Saltation is a geologic process by which sand or larger particles are transported by a fluid (air or water) over short distances that can impact other particles causing more particles to become airborne.

transmission towers, and power stations) should contain the same descriptive, map, and photo information to specifically inform the public and decision makers about potential impacts to Joshua Tree National Park visitor experiences.

Night Sky

The proposed project is located in one of the most pristine areas for night sky viewing. Mitigation measures from light trespass, relating to security, nighttime operations for aircraft and other activities appear to have been addressed. We strongly encourage and support any further mitigation that would prevent light trespass from the proposed project. We suggest that a monitoring plan be developed to maintain existing levels of darkness throughout the life of the project, and we would be willing to work further with the BLM on developing this program.

Wildlife resources

Measures to reduce impacts to the habitat of the Mojave fringe-toed lizard are encouraged (e.g., the Reduced Acreage Alternative). Park populations of the lizard are dependent on the nearby habitat of the Chuckwalla Valley for genetic migration purposes. The protection of the habitat and associated corridors will be essential in ensuring strong genetic structure within isolated Mojave fringe-toed lizard populations found in the Chuckwalla Valley and Pinto Basin.

The NPS also supports utilizing lands for the siting of renewable energy facilities that have already been disturbed (e.g., agricultural and grazing lands) and therefore would have a significantly reduced impact to natural resources (e.g., in the Gabrych Alternative). The park also supports using sites that are not identified as critical habitat for any threatened or endangered species, and are thus unlikely to have any impacts on special status species.

If you have any questions or need additional information, please contact the park superintendent's office at 760-367-5502, or Andrea Compton, Chief of Resources at 760-367-5560, Andrea_Compton@nps.gov.

Sincerely,

John Slaughter
Acting Superintendent

Cc: Curt Sauer, Superintendent, Joshua Tree National Park
George Turnbull, Acting Regional Director, Pacific West Region
Carol McCoy, Geologic Resources Division, Natural Resource Program Center
David Reynolds, Land Resources Program, Pacific West Region
Alan Schmierer, Environmental Coordinator, Pacific West Region
Andrea Compton, Chief of Resources, Joshua Tree National Park

Brendan Hughes
<jesusthedude@hotmail.com>

07/11/2010 04:40 PM

To <capssolarnexterafpl@blm.gov>,
<mmonasmi@energy.state.ca.us>
cc
bcc
Subject Comments on Genesis Solar Power Project DEIS

To whom it may concern:

My name is Brendan Hughes and I would like to comment on the Genesis Solar Power Project DEIS. This project, if constructed, will have severe impacts to biological and cultural resources, wilderness, and water. I encourage BLM and CEC to choose the No Action Alternative with an amendment to the CDCA Plan to prohibit solar development of this area in the future.

This project would destroy almost 2,000 acres of intact desert habitat, currently used by sensitive species such as the Mojave fringe-toed lizard, kit fox, American badger, mule deer, and many different types of raptors. Genesis will also cut off wildlife corridors between Wilderness Areas and the Chuckwalla DWMA ACEC. Additionally, although not currently occupied by desert tortoises, it is suitable habitat that they may re-occupy in the future. Moreover, the sensitive microphyll woodland habitat type will be impacted by this project. These threats to biological resources are not outweighed by the benefits of this project. Cultural resources will also be severely impacted by this project.

The Genesis Project is directly adjacent to the Palen-McCoy Wilderness Area, and within the viewshed of the Chuckwalla and Little Chuckwalla Wilderness Areas. These visual impacts cannot be mitigated, and will affect my visits to these special places. BLM and CEC should not allow this large-scale blemish on an otherwise clean viewshed to go forth. Impacts such as these should be concentrated in areas that already have surface disturbance and degradation to the viewshed.

Finally, this project will use an unacceptable amount of water for its operation and maintenance. Genesis will essentially be mining fossil groundwater, which is not a renewable resource, especially in the desert. This project combined with the potential of other groundwater development from solar and energy storage projects will have terrible impacts to the Chuckwalla Valley. BLM and CEC should not allow this wasteful use of Ice Age water resources.

Thank you for your consideration.

Brendan Hughes
61093 Prescott Trail
Joshua Tree, CA 92252

The New Busy think 9 to 5 is a cute idea. Combine multiple calendars with Hotmail. Get busy.

Tom Budlong
3216 Mandeville Canyon Road
Los Angeles, CA 90049-1016

RECEIVED
BUREAU OF LAND MANAGEMENT
10 JUL 14 PM 12 42
PALM SPRINGS-SOUTH COAST
RESOURCE AREA

July 8, 2010

Allison Shaffer
BLM Palm Springs Field Office
1201 Bird Center Drive
Palm Springs, CA
92262

Dear Ms Shaffer

Below are comments on the joint CEC – BLM Staff Assessment and Draft Environmental Impact Statement Genesis Solar Energy Project (CEC project 09-AFC-8). Referenced exhibits are included.

Regards,

Tom Budlong
310-476-1731
TomBudlong@RoadRunner.com

INTRODUCTION

Concern with the 250MW characterization of the project is described in the testimony. The actual output is approximately one quarter of the 250MW. Though probably unintentional, when seen by laymen and the general public the 250MW characterization is deceptive. Even when seen by most non-laymen involved in solar projects, the difference between capacity and actual is not understood or appreciated. One glaring example of damage is the biomass alternative, which incorrectly assumes equivalent outputs for the 250 MW proposed project and a 250 MW biomass project, despite the much higher biomass capacity factor. The geothermal alternative is almost certainly in the same category.

The alternatives section is inadequate. In numerous places is in violation of NEPA. Reasons for elimination of many alternatives are often illogical and incomplete.

Despite proposing conversion of 2000 acres of pristine untouched desert to industrial, mostly highly reflective mirrors, the DEIS concludes visual impact would be less than significant. It does this by assuming discretionary measures of questionable value that are specified in the Conditions of Certification would happen, and would be effective. The less than significant conclusion should be removed.

These problems with the DEIS, and others described in more detail in this document, are sufficient that the DEIS should be corrected and reissued as a second draft edition, with another full 90 day review period. I realize this would put the government guarantees and subsidies in jeopardy. These are not our responsibilities. Our responsibilities are to fairly present the project and alternatives, and to do the best to get the project done right.

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1) The project is in basic violation of NEPA

Reference Exhibit 701 - NEPA - The National Environmental Policy Act of 1969.

NEPA's Title I, Section 101, details basic and fundamental goals. Following are quotes from this section, and then the full text of the section.

In relating the quotes to the proposed project, it is important to keep in mind that the proposed project will completely use up undeveloped, essentially virgin land. The land will convert from near pristine and virtually untouched to a high-intensity industrial zone. It will destroy essentially all of the property's plant and animal life, environmental benefits, and prehistoric cultural evidence. It will be a complete change in the visual impact, inconsistent with most visually adjacent lands.

Quote	Comment
The Congress recognizing the profound impact ... industrial expansion ... resource exploitation... recognizing further the critical importance of ... maintaining environmental quality...	Congress understands the deep importance of maintaining environmental integrity.
... create and maintain conditions under which man and nature can exist in productive harmony ...	The phrase productive harmony is inapplicable for this project. Nature is effectively destroyed, and there can be no harmony with something that does not exist.
...fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.	We are trustees of the environment, responsible for the future. Destroying the environment violates this trust.
... assure...productive and aesthetically and culturally pleasing surroundings	The Genesis site as an industrial site is not aesthetically and culturally pleasing. The site may be productive, but is not both, as required.
...attain the widest range of beneficial uses of the environment without degradation...	The degradation mentioned would be complete.
Preserve...natural aspects, maintain..diversity ...	Both natural aspects and diversity would be entirely removed.
... each person has a responsibility to contribute to the preservation and enhancement of the environment.	The effect of the proposed project is exactly opposite of preserving and enhancing.

Here is the full text of NEPA's introduction, the source of the quotes:

TITLE I
CONGRESSIONAL DECLARATION OF NATIONAL ENVIRONMENTAL POLICY
Sec. 101 [42 USC § 4331].

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consist with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

2) Applicant Objectives

One of the applicant's primary objectives, profit at minimal risk, is omitted from the DEIS and should be included. This objective is more fundamental than the applicant objectives stated in the DEIS. To help understand that it is fundamental, consider that the applicant would not have conceived of and applied for project certification without a reasonable profit potential. It would not come to California for altruistic purposes.

That the applicant requires a profit is not a negative criticism. It is an enterprise which must be profitable to be viable, and so can only engage in ventures with a reasonable risk and reasonable profit potential. That the profit motive 'goes without saying' does not argue for its omission, since it is indeed the primary motivation.

This objective should be first in the list of applieant project objectives, to bring focus and understanding to the underlying motivation of the applicant. The DEIS should be understood in this context.

3) BLM Purpose and Need Statements are Incorrect.

DEIS page 7 lists authorities.

1) 'Executive order 13212 ... which mandates ...'

The full Executive Order is included as exhibit 702.

Use of the word 'mandate', and omission of mentions of environmental concerns in the executive order are misrepresentations of the flavor of the Executive Order, in violation of requirements for Environmental Impact Reports. They lead readers astray.

The sense of the text of the EO is a priority, not a mandate. In fact, the word mandate does not appear in the order. Also omitted is that the order is sensitive to the environment, with the clauses '*environmentally sound manner*' and '*while maintaining ... environmental protections*'. The full text of the paragraphs with these excerpts is:

Section 1. Policy.

The increased production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people. In general, it is the policy of this Administration that executive departments and agencies (agencies) shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.

Sec. 2. Actions to Expedite Energy-Related Projects.

For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation, and where appropriate.

2) 'Secretarial Order 3285 of March 11, 2009, which establishes the development of renewable energy as a priority for the Department of the Interior.' The order is included as Exhibit 704.

Please note that the order includes the clause '...while protecting and enhancing the Nation's water, wildlife and other natural resources.' Section 4, Policy, is:

Sec. 4 Policy.

Encouraging the production, development, and delivery of renewable energy is one of the Department's highest priorities. Agencies and bureaus within the Department will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission while protecting and enhancing the Nation's water, wildlife and natural resources.

Contrary to the impression in the DEIS, these show that Congress and the Interior Department are concerned with environmental and natural resources as well as energy sources, that they must co-exist, and that one does not

trump the other. They do not 'mandate', and they do not 'require', and they are as specific about environmental protection as about encouraging renewable energy. One does not take priority over the other.

The proposed project, having unmitigable significant impacts to several aspects of the environment, is out of compliance with the orders. We must be more clever in designing renewable energy solutions.

4) BLM Purpose and Need is Too Restrictive

Note that NEPA Section 1502.14 states

> *'agencies shall... rigorously explore and objectively evaluate all reasonable alternatives....'*

The BLM purpose and need (DEIS page A-13) states

> *The BLM's purpose and need for the GSEP is to respond to the applicant's application under Title V of the FLPMA (43 USC 1761) for a Right-Of-Way (ROW) Grant to construct, operate and decommission a concentrated solar thermal electric generating facility, and associated infrastructure*

This purpose and need statement does not address the fundamental issue of renewable energy.

The purpose and need statement circumvents the NEPA requirement to evaluate reasonable alternatives, since it requires concentrated solar. Nothing in NEPA restricts alternatives to the technology proposed by the applicant, or precludes alternatives from using alternate technologies.

The purpose and need statement also appears to restrict the alternatives to the site the applicant has chosen. But NEPA demands reasonable off-site alternatives be considered. Reference Exhibit 706, which includes Question 2b from NEPA's 40 questions:

> *2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?*
>
> *A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the bosis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).*

5) Project Objectives

Several of the project objectives are unreasonably narrow.

NEPA explicitly prohibits this limiting of alternatives. It is properly concerned with finding the best solution, and specifically requires the alternatives considered not be limited to what the applicant wants or is capable of doing.

The limitations contained in the project objectives are in direct violation of Question 2a of NEPA's 40 Questions (see Exhibit 706).

> *2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal opproval, must the EIS rigorously analyze ond discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?*
>
> *A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practicol or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.*

The DEIS has concluded there are no significant impacts. This may or may not be true. This testimony shows that visual impacts are not mitigated to less than significant. Other environmental impacts not discussed in this testimony may also be shown not to be less than significant.

If indeed, as claimed in the DEIS, the proposed project has no significant effects, then NEPA would not require any alternatives be analyzed. Of course, this is an absurd conclusion, completely violating the spirit of thrust is to determine the best reasonable and feasible solution. Accordingly, the DEIS uses 100 pages to discuss alternatives.

The proposed project meets the three restrictions that NEPA prohibits, arousing suspicion that the restrictions are chosen to favor the proposed project, the very situation NEPA is designed to prohibit.

High Solarity Site

In violation of NEPA Question 1a (Exhibit 706), project objectives stated in the DEIS require the project be developed on a site with excellent solar resource. This restriction precludes Geothermal, Biomass and Wind alternatives, since they are independent of solarity, and technologies that could be considered unconventional but do not require high solarity. Although eliminated for other reasons, the high solarity requirement also precludes tide and wave technologies.

This requirement for a high solarity area occurs throughout the DEIS. Some of them:

- Applicant's Project Objectives (p. B.2-9)

  To develop a site with an excellent solar resource

- CEQA PROJECT OBJECTIVES / Energy Commission objectives (p. 6)

  • *To locate the project in an area with high solor insolation (i.e., high intensity of solar energy);*

- GSEP specific objectives (p. A-12)

  • *To locate the project in an area with high solar insolation (i.e., high intensity of solar energy);*

Trough Technology

Also in violation of NEPA Question 2a, project objectives in the DEIS are narrowed to require parabolic trough technology:

Some occurrences:

- Applicant's Project Objectives (B.2-9)

  • *To develop a new utility-scale solar energy project using proven concentrated solar trough technology.*

- PROJECT OBJECTIVES The Genesis Solar Energy Project objectives are as follows: (B.1-30)

  • *To develop a new utility-scale solar energy project using proven concentrated solar trough technology*

- CEQA PROJECT OBJECTIVES / Energy Commission objectives (p.6)

  • *To develop a utility-scale solar energy project utilizing parabolic trough technology;*

- PROPOSED PROJECT OBJECTIVES: The specific objectives of the Genesis Solar Energy Project are: (pA-12)

  • *To develop a utility-scale solar energy project utilizing parabolic trough technology;*

ARRA Funding

ARRA funding must not be considered a project objective. The applicant has stated that it intends to apply for ARRA funding. This artificial objective removes potentially viable alternatives, in violation of NEPA. Environmental impacts are not dependent on ARRA funding.

6) Economic Analysis

The EIS must include economic analyses of the proposed project and alternatives.

Economic analysis to examine and understand economic feasibility of the project is fundamental, and a foundation for analysis of the project and for alternatives analysis. The project will present a huge environmental disturbance to the area. If it becomes economically unfeasible it will eventually be abandoned, leaving an impact that cannot be repaired or returned to undisturbed condition in a reasonable time frame, perhaps essentially forever. The probability of such an environmental impact cannot be ignored in an Environmental Impact Report. Alternatives must be analyzed to the same economic criteria for the same reason. They cannot be considered in a vacuum of comparison to the proposed alternative.

Recognition of Economic Importance by the DEIS

The concept that economic analysis is basic is recognized in many places the DEIS:

- Proposed Project Objectives (p.6):

  To construct and operate an environmentally friendly, economically sound, and operationally reliable solar power generation facility...

- This is repeated almost verbatim on pages A-12 and C.13-24 (The specific objectives of the GSEP are:)

To construct and operate an environmentally and economically sound, and operationally reliable solar power generation facility

- On pages B.1-30 and B.2-9, talking of applicant objectives:

  To construct, operate and maintain an efficient, economic, reliable, safe and environmentally sound solor powered generating facility

- The discussion of the Reduced Acreage alternative on page B.2-15 states:

  A detailed cost-benefit analysis for a reduced-size project would be required in order to determine the economic feasibility of this alternative. As a result, feasibility is uncertain at this time.

- Economics is of concern for the Reduced Acreage Alternative;

  page B.2-85:

  While the Reduced Acreage Alternative would meet most project objectives, it is uncertain whether the Reduced Acreage Alternative is economically feasible.

  page B.2-15:

  A detailed cost-benefit analysis for a reduced-size project would be required in order to determine the economic feasibility of this alternative. As a result, feasibility is uncertain at this time.

- Economics appears to be of concern in at least one instance in the SEIS when discussing the economic feasibility of dry cooling.

Other considerations mentioned in regulations and the DEIS require consideration of economics.

a) NEPA's Council of Environmental Quality is specific. Question 2a of the CEQ's 40 Most Asked Questions (Exhibit 706) requires economic analysis[1]:

*2a. **Alternatives Outside the Capability of Applicant or Jurisdiction of Agency**. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?*

*A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives ta be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the **technical and economic standpoint and using common sense**, rather than simply desirable from the standpoint of the applicant. [Emphasis added]*

NEPA is concerned with ensuring only reasonable alternatives need be considered. The definition of reasonable alternatives is practicality and feasibility from:

- the technical standpoint,
- the economic standpoint,
- and using common sense.

Section 1502.14 continues, requiring as the basis for choice, a presentation that includes the proposal and the alternatives defined as reasonable.

Nepa Sec. 1502.14 Alternatives including the proposed action.

*This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment (Sec. 1502.15) and the Environmental Consequences (Sec. 1502.16), it should present the environmentol impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and **providing a clear basis for choice** among options by the decision maker and the public. [Emphasis added]*

Elsewhere in NEPA, Section 1501.2(b) requires comparison of environmental effects and values with economic and technical analyses, and that these documents and analyses be made available.

Each agency shall:

*(b) Identify environmental effects and values in adequate detail so they can be compared to **economic** and technical analyses. Environmental documents and appropriate analyses shall be circulated and reviewed at the same time as other planning documents.*

[1] The CEQ 40 Most Asked Questions and the answers are at http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm. The CEQ authorization memo (Exhibit 705) is at http://ceq.hss.doe.gov/nepa/regs/40/40p2.htm

Clearly, NEPA intends economics be part of the decision process, parallel with technology and impacts to the environment.

b) The CEC requires that the project sell competitively priced electricity:

- Page B.2-68, discussing CEQA and NEPA criteria for distributed solar alternatives:

  ...CEC project objectives to operate 250 MW of renewable power in California capable of selling competitively priced renewable energy.

- Page B.2-80:

  However, gas-fired plants would fail to meet a major project objective: to construct and operate a renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities

  (The needs of California utilities are not described.)

Fulfillment of the project objective of competitive price cannot be verified or judged without an economic analysis.

c) The Alternatives Section, Summary of Conclusions, quite properly talks about costs of alternatives:

Page B.2-2 shows cost concern for rooftop solar:

...increased deployment of distributed solar photovoltaics faces challenges in manufacturing capacity, cost, and policy implementation.

It is impossible to consider alternatives and compare them to the proposed project without analyzing costs of each.

d) USACE regulations require cost consideration:

Page B.2-8, when discussing USACE alternative requirements :

(2) An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Cost must be considered in determining the practicality of an alternative. An analysis is required.

e) Evaluation of alternative sites requires consideration of cost:

Page B.2-21. One of the site selection criteria is:

• site should be located on property currently available at a reasonable cost.

g) That the project be economically sound is one of the CEQA Project Objectives. In fact, it is list first among the several objectives, implying its importance. Several discussions emphasize this. See page C.13-24:

To construct and operate an environmentally and economically sound, and operationally reliable solar power generation facility that will contribute to the State of California's renewable energy goals:

These examples demonstrate that economic and cost analysis is an integral, necessary component of the "basis for choice among options by the decision maker and the public" (The quote is from NEPA, as quoted above.)

That economic considerations are mentioned in numerous places in the documentation is understandable, since the project probably would not exist without economic justification and a cost-to-benefit analysis. An economic analysis is necessary to evaluate the project, and to compare it with alternatives. Without an economic analysis we are forced into the qualitative terms 'cost more', or 'cost less'. Intelligent decisions cannot be made with acceptable confidence when based on unnecessary non-specific terms.

It is tempting to say that the project is necessary, no matter the cost, for the public good of reducing global warming, currently accepted as a necessary goal. But this is not an 'at all cost' project.

Additionally, since the project will likely be subsidized with public money and will likely use public land, transparency demands that the economics of the project be revealed to the public.

An economic analysis should include comprehensive details, including but of course not limited to:

- Cost of construction.
- Cost of financing the construction.
- Cost of land usage – purchase or lease.
- Operation costs when the facility is up and running.
- Cost of washing parabolic dish mirrors, compared to flat mirrors.
- Insurance costs.
- Revenues from electricity sales.

- Taxes
- Government subsidies
- Other costs and revenues.

7) Net Energy Analysis:

The DEIS is missing analysis of the net energy produced. It is impossible to judge if the project balances the environmental cost without knowing how well the project satisfies its basic purpose. It is even possible that energy used for construction and operation will exceed the total output over the project life. This balance cannot be estimated without an analysis. Common sense dictates that plans for a project intended to produce energy include analysis of the net energy that will be produced. I have not found in the documentation justification for the stated 40 year life, nor analysis to support the stated production of 1,620,000 KWh/year.

This analysis should compare net usable energy produced against the no-action alternative, which would neither use nor produce energy. It should also compare against the alternatives. It should include (but of course not be limited to):

- Energy delivered to the customer, after it has gone through transmission lines.
- Energy required to upgrade or make new transmission lines.
- Energy expended during construction – machinery fuel etc.
- Personnel commuting energy (gas for commuting vehicles), during construction and production.
- Energy to transport the plant machinery to the site.
- Life cycle analysis: Energy to make the parabolic mirrors, exclusion fence, and all other facilities. This energy should be compared to the no-action alternative, which would use no materials, and so should include the energy required to mine the materials, through the manufacturing process to the finished product.
- Construction will advance construction machinery to its eventual end of life. The energy analysis should include the energy needed to either replace worn out machinery, or a percentage of life used. Again, this should include total cost of replacement, from mine to finished product. (Without this project, these costs would be avoided.)
- Parasitic energy during production.
- Energy required for decommissioning at the end of the useful life of the power plant.

8) The Synergy of Cost, Motivation and Net Energy

Given the very large government economic incentive, it's even possible that the project will satisfy the applicant's basic profit motivation while providing an insignificant net energy. Should this happen, the huge environmental cost would have been spent for naught.

It is imperative the Environmental Impact Statement objectively examine the components of the issue separately, and subsequently examine them together.

9) The 250MW rating is incorrect

The facility will generate approximately 68MW, not 250MW.

Page B.1-3 states that each 125MW plant will produce approximately 300,000 MWh/year, approximately 27% capacity factor. Of course, the combined output of both equally plants would be 600,000 MWh/year.

Indeed, dividing 600,000 MWh/year by the number of hours in a year (24x365) gives 68 MW, and 68/250 is 27%. This is in line with capacity factors for CSP solar generators in general.

The actual output (600,000 MWh/year, or 68 MW) appears in very few places in the DEIS. Compare this statement with the 250MW rating used repetitively in the DEIS.

This conflict in emphasis is a gross, misleading mischaracterization, and must be corrected. The number invites almost all readers to assume the plant will produce almost four times as much as it actually will produce. The misconception carries to media reports and to general public perception. It misleads the public, and authors of the DEIS as well.

The difference between the oft-stated 250MW and actual production is not directly explained in the DEIS. Perhaps attempting to justify the discrepancy, many places the DEIS modify the 250MW with 'net', 'nominal' and 'capacity'.

- Use of the modifier 'nominal': The dictionary definition of nominal is "Existing in name only; not real or actual" (Houghton Mifflin), and 'without reference to actual conditions" (Merriam's Webster's).
- Use of the modifier 'net' when referring to the 250 MW rating. Of course, a net amount is the actual amount received. A common example is packaged foods and other goods. Use of this word here is incorrect.
- Capacity is a illusory and deceptive tool, requiring skepticism or experience to question it is not what you get. It is not explained.

This is important.

- Readers who are not aware of the discrepancy are misled. An extremely small number of people would think to question the 250 MW number. An even smaller number would be able to locate the infrequently mentioned actual output in the DEIS, understand the implication, and do the arithmetic to verify.
- Note that the CEC's main web page for the Genesis project says:

  The project consists of two independent solar electric generating facilities with a nominal net electrical output of 125 megawatts (MW) each, for a total net electrical output of 250 MW.
- The authors of the biomass alternative in the DEIS were misled. They treated as equivalent the 250 MW proposed project, whose capacity factor is around 25% and a 250 MW biomass facility, whose capacity factor would be around 80%. The same error was made in the geothermal alternative analysis.
- The DEIS analysis of the geothermal alternative appears misled. It apparently makes the mistake of equating this '250 MW' project with a 250 MW geothermal facility, despite the greatly different capacity factors, and hence actual output, of geothermal plants.
- People outside the project assume it generates 250 MW. This is evident in press reports. The result is feeding incorrect information to the public.

  Cooler Planet, Nov 12, 2009 (http://solar.coolerplanet.com/News/11120901-california-paves-way-for-genesis-solar-energy-project-in-riverside-county.aspx)

  The project, under the auspices of Tucson. Arizona-based, privately held Genesis Solar LLC, will consist of two independent solar electric generating facilities with a combined total output of 250 megawatts, sited on 1,800 acres of BLM- (Bureau of Land Monagement -)

  Genesis Solar Energy Project (CACA 48880) (undated) This is the BLM's announcement of the project. (http://www.blm.gov/ca/st/en/prog/energy/fasttrack/ genesis.html)

  The proposed project is a parabolic trough solar thermal power generating facility designed to produce 250 megawatts of power.

  Solar Panels and Solar Energy.com (undated) (http://www.solarpanels-solarenergy.com/solar-panels/california%E2%80%99s-genesis-solar-energy-project-looking-up/)

  The project will include of two independent photovoltaic electric generating facilities which will have a combined total output of 250 megawatts. Under the auspices of Tucson based private company, Genesis Solar LLC, the project will be situated on 1,800 acres Bureau of Land Management land. (http://www.blm.gov/ca/st/en/prog/energy/fasttrack/genesis.html)

That this practice is common with most solar facility descriptions is not a reason or excuse to allow it to happen in this documentation. It is wrong and misleading to the point of being fraudulent. One responsibility of the documentation is to fairly describe the proposal, and 250 MW does not do that.

Because this is a common practice, the documents should explain the difference between maximum and average output, explain Capacity Factor, and explain that the output is commonly mis-stated. Because it is easy to miss a single explanation in such a large amount of documentation, or not understand its implication, or be seduced by repetition of the 250 MW number, all documentation connected with the project should be corrected. Perhaps both numbers should be used side-by-side, and when comparing Genesis with other facilities the 250 MW number could be used, with explanation. The purpose is to avoid misleading readers who are innocent of this situation.

Here are example locations in the DEIS that refer to 250 MW with no reference to actual output and no use of the conditional 'net', 'capacity, or 'nominal' words.

Page	Quote
C.5-21	The reduced emissions would decrease the cancer risk and chronic and acute hazard indices predicted for the 250 MW project as proposed.

Page	Quote
B.1-2	The overall site layout and generalized land uses are characterized as follows: 250-MW facility, including…
B.2-19	BLM's "action alternative" would be to amend the CDCA Plan to include GSEP (250 MW), and …
B.2-5, B.2-70	While it will very likely be possible to achieve 250 MW of distributed solar energy over the coming years…
B.2-5	Therefore, the development of 250 MW of new geothermal generation capacity within the timeframe…
B.2-13	Sufficient disturbed, private lands for a 250 MW solar power plant were not available near the GSEP,…
B2-50	The design of a 250 MW project at the Gabrych Alternative would be similar to that of GSEP at the proposed site.

To put it more bluntly, the DEIS is fooling most everybody with the 250MW number. That's unethical.

10) Visual Impact

The proposed project is a 2,000 acre industrial site on and surrounded by untouched, pristine desert. Staff's conclusion that it will have less than significant visual impact is absurd. The proposed conditions of certification cannot promise and do not warrant the conclusion.

How is the conclusion possible? The answer is in certification condition language that is open to subjective interpretation and to evasion. Essentially, the requirements say to the constructors 'Implement your definition of feasible and minimization of visual impact – no more is required.' Many of the conditions are platitudes, with no concrete specifications. The conclusion of less than significant visual impact cannot be based on this level of discretion and imprecision. The reality is that no mitigation can make an industrial island in undisturbed visually intact surroundings visually less than significant.

With the level of latitude in implementation that is in the conditions, justification of project permission based on the prediction that visual impact will be less than significant could well be called insincere. After construction, when the visual impact turns out to be significant, it is inconceivable that any level of authority would stop the project, order it dismantled and the land returned to original condition.

Imprecise requirements in the Conditions of Certification

Condition	Revised Staff Assessment Excerpt	Comment
VIS-1	…treat all non-mirror surfaces … such that their colors minimize visual intrusion…	'minimize' is subjective. It implies the smallest possible, but possible must be viewed in terms of practicality – time and expense. Even given unlimited time and expense, it's doubtful a surface color could mimic light reflection, shading, texture, highlighting and other requirements to realistically mimic the natural world. No evidence is presented that minimizing makes the visual impact less than significant.
	… their [non-mirror surfaces] colors and finishes do not create excessive glare…	'Excessive' is subjective. Certainly project personnel and those who appreciate deserts could have different interpretations of 'excessive'.
	…coloring of security fencing…to blend to the greatest extent feasible with the background soil.	'greatest extent feasible' is completely subjective. The full quote mentions slats, vinyl, non-reflective, … No evidence is presented that these would make the visual impact less than significant.

Condition	Revised Staff Assessment Excerpt	Comment
VIS-2	To the extent feasible…consistent with safety and security …	The conditions are meaningless since: Safety and security can at any time justify violation of the goal. 'to the extent feasible' is subjective. The goal of less than significant visual impact could easily be deemed not feasible.
	a) lamps and reflectors are not visible from beyond the project site.	This could be deemed not feasible, or required for safety and security.
	b) lighting does not cause excessive reflective glare	'excessive' is subjective.
	c) direct lighting does not illuminate the nighttime sky…	'does not illuminate' is subjective.
	c)…except for required FAA aircraft safety lighting	I found nothing in the DEIS to describe FAA requirements. Do they define 'excessive' lighting? If FAA requirements result in high night-time light pollution, they would obviate the conclusion of less than significant visual impact.
	d)…illumination of the project and its immediate vicinity is minimized.	Both 'immediate vicinity' and 'minimized' are subjective.
	E. All lighting shall be of minimum necessary brightness consistent with operational safety and security.	'minimum necessary' is subjective. Security personnel and safety personnel can, at any time, cite safety and security to demand lighting that results in significant visual impact.
	F. …To the greatest feasible extent, project lighting shall be used on an 'as needed' basis…	'greatest feasible extent', and 'as needed' are subjective. Management at any time can install lighting that presents significant visual impact under the authority that the lighting is needed, and anything less is not feasible.
VIS-3	…set back the transmission line at least ½ mile from I-10, if possible.	The 'if possible' clause invites interpretation that it is not possible, or not possible on practical terms. No evidence is presented that a ½ mile setback would result in less than significant visual impact.
VIS-4	…chain link fencing … opaque privacy slats of a minimum 8 feet in height…	The fence will be 8' high (page C.6-5), or 10 feet high (page C.10-13). Independent of this discrepancy, both are too low to hide the mirrors, which can be 25'-30' high (pages B.2-59, C.2-96) (30' at B.2-60). VR Fig 5 shows structures approaching 50' high. Structures, especially mirrors, substantially higher than fencing will produce a significant visual impact.
VIS-6	To the extent possible… …reduction of unnecessary disturbance. Retain as much …as possible Minimize the number of structures… Use natural appearing forms… Reduce the amount of disturbed area…	The phrases are subjective. Each can justify design that increases visual impact well above less than significant. Ignored is the bald fact that an industrial site in the midst of de-facto wilderness will be visually intrusive. The most sensitive designer could not avoid this fact.

Glare Impacts

Glare impacts are discussed, with some confusion, starting on page C.12-21. The confusion is from using the term 'focal plane' of the troughs. Focal plane is a common term with lenses. The focus of a parabolic trough would be a line, the line occupied by the heat collection tube. Another confusion is the excerpt "…the bright spots depicted are believed by staff to be spread reflections of the sun." Unexplained is the contradiction of spot and spread.

Independent of this confusion, the discussion explains what could be called fugitive light from the mirrors, using several descriptions. These excerpts appear on page C.12-21 of the DEIS:

- during certain times of day the mirror units can produce substantial glare and that such glare can be experienced by the public from locations in the project vicinity as intrusive nuisances and may be a distraction
- … bright spots … may appear to be very bright.
- The bright spots also appear to 'follow' the viewer
- produce a linear reflected solar image which may be visible briefly to nearby observers.
- these reflections may, under the right conditions, be prominently visible from several miles away.
- The existing Chuckwalla Valley within the project viewshed is essentially dark at night. The pristine, unlit night sky is an important part of the camping experience for many visitors to remote areas such as the nearby Wilderness Areas.

It's obvious that the mirrors produce reflections visible well away from the project site, and that night-time light pollution is an issue of concern. The DEIS recommends VIS-4 to prevent bright spot reflections, but that this conclusion is based on 'available data', indicating that staff is working with incomplete data. It continues with recommending VIS-2, repeating words that are open to subjective interpretation and/or make recommended measures optional, or even impossible: 'does not cause excessive reflected glare, 'except for required FAA safety lighting', 'minimize to an as needed basis', 'wherever feasible'. These are the same potential exceptions to effective control that appear in the text of the Conditions of Certification.

Further Discussion

The photos modified to show the project from I-10 locations show no glare (Figs, 8B, 9B, 10B). Since the mirrors will be visible from some part of the freeway to varying degrees during the day, the glaring surfaces are always visible to some drivers.

Typical is the KOP-1 discussion. KOP-1 will have the most visual impact from I-10. The discussion on page C.12-15 recognizes this:

the project would occupy a vast horizontal area, extending across the entire width of the field of view	This recognizes the potential for visual impact.
the level of brightness of the mirror field could be much greater than depicted in the simulation [Figure 8B] substantially increasing the project's level of contrast under certain conditions.	The discussion does not define the 'certain conditions'.
Spatial and scale dominance of the vast mirror fields is potentially great, but again greatly moderated by the very narrow portion of the view affected. Dominance would be accentuated during conditions of bright mirror reflection, which would draw attention to the facility	With no light coming from the mirror field, the narrow vertical field would indeed make the project hard to see. But during operation, the mirrors will reflect, most probably making them very noticeable.
Overall visual change to viewers on I-10 is thus considered moderately low, or moderate during the brightest periods of diffuse glare as indicated in Visual Resources Figure 12	
Visual change could rise to a moderately high level if viewers were exposed to bright point spread reflections of the sun as depicted in Visual Resources Figure 13	Figure 13 show Nevada Solar One with substantial glare.
The discussion then attempts to minimize the impact by citing VIS-4, and the conditions of certification in general.	
With staff-recommended Condition of Certification VIS-4, bright point reflections could be blocked, reducing glare to occasional episodes of moderate visual change from diffuse reflection from the mirror fields as a whole.	The text is not confident that glare would be blocked, using the conditional 'could' instead of 'would be blocked', perhaps in recognition that the fence is much lower than the mirrors. Most of the conditions of certification are worded to be optional, implemented at the discretion of the project, which could decide the exceptions are not feasible, are
With all recommended conditions of certification, overall visual change would thus remain moderate.	

In the context of the setting's moderately high visual sensitivity, this moderate level of visual change would, with recommended conditions of certification, be less-than significant.	incompatible with safety and security, are minimized to the project's satisfaction, are not compatible with FAA regulations, are needed full time, ... Despite these flaws, the text manages to conclude the visual impact is 'less than significant'. But since there is no confidence the conditions would be implemented the conclusion of less than significant visual impact is not defensible.

11) Alternatives

Introduction

NEPA's underlying principal is to understand and know before deciding, that inadequate information leads to unsound understanding, leading to unsound decisions when balancing environmental protection with our activities. Thus, the environmental policy contained in NEPA.

NEPA Requirements

NEPA demands clear, adequate presentation and discussion of both impacts and alternatives. The text from NEPA (1502.14), for example, is explicit:

> *... it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public.*

The DEIS alternative section does this, but only in a few places. Substantial parts are brief, qualitative where they should be quantitative, and do not present alternatives in comparative form. Too often, statements are made with no backup data or evidence, and have the flavor of arbitrary opinions. Reasons for elimination of an alternative often apply to GSEG as well as the alternatives. These shortcomings must be corrected before the DEIS can be considered an adequate depiction of the situation, for adequate understanding, and for intelligent decision making.

CEQA Project Objectives

Section A4, page 6 of the Genesis DEIS emphasizes the project must be located in an area with high solar insolation.

> • *To locate the project in an area with high solar insolation (i.e., high intensity of solar energy);*

This objective is stated twice in the section.

It is repeated elsewhere. Page B.2-66:

> *The solar technology would not necessarily meet the objective to locate the facility in areas of high solarity, because the distributed technology could be located throughout the State.*

This objective is illogical, and in violation of NEPA. It disfavors alternative solutions. It does not allow for alternatives, still using the same technology, that could provide the same energy with less impact despite not being in an area with high solar insolation.

It is illogical for the very same reason that NEPA prohibits artificial conditions. It unreasonably restricts alternatives, throwing favor toward the applicant's proposed solution. Indeed, the overriding objective of the national exercise toward renewable energy makes no pretense to favor location – it is interested in renewable energy (with other considerations, such as environmental), and makes no judgment as to insolation or other similar properties such as air temperature, altitude, terrain... With this artificial requirement, alternatives such as geothermal, biomass, even tidal wave, could conceivable be chosen, but only they are in an area with high insolation despite being completely independent of solar radiation.

By way of hypothetical example, presume that tomorrow one of the labs working on PV announces a very low cost technology that converts at 100% efficiency, so long as the radiation on the PV does not exceed 50% of maximum that occurs in high solar areas. To force this technology to a high solarity site would require artificially shading the PVs, only to meet the artificial requirement. It would preclude the hypothetical PV from a location in a better area with lower radiation. Obviously, this would be ludicrous.

Indeed, the rooftop alternative is rejected because rooftops are not common in high solarity areas. This judgment is independent of the viability of the alternative.

NEPA Requirements

NEPA has been interpreted by the Council of Environmental Quality, which issued answers to '40 Most Asked Questions' (Exhibit X00-07). Question 2a addresses the question of the alternatives that must be included. It seems obvious the CEQ was concerned that wild impractical schemes not be required to be considered, and that reasonable alternatives not primarily desirable to the applicant must be considered.

> ***2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency.*** *If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?*
>
> *A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. [Emphasis added]*

Implied in this answer is that artificial restrictions not be placed on alternatives considered.

Summary of Impacts

The Summary of Impacts for the Gabrych alternative counts the number of impact categories that have impacts similar to, greater than, and less than the proposed project. Thought not stated explicitly, the implication is that comparing the number of greater impact categories to the number of lesser impact categories leads to a conclusion. Not considered by this method are the levels of impacts of the various categories.

I attempted to factor in level of impact for the Gabrych alternative by assigning impact levels derived from the impact discussions in the DEIS. They are subjective, and others may wish to assign different levels. The result shows the Gabrych alternative is superior to the GSEG proposal.

Proposed Site

Major objections to the project include the effectively complete and permanent destruction of the biological, cultural, visual and aesthetic character of the site. No matter how you look at it, or how many mitigation measures are applied or devised, the result is that the site is essentially destroyed – it becomes single purpose industrial – a complete transformation out of character with its surroundings. Yet Riverside and Imperial Counties have abundant disturbed land in high solar areas. It's difficult to believe that a solution cannot be devised to put the project on disturbed land already exhausted of the values mentioned above. In the end, it's not necessary to consume the proposed site to provide solar power.

Combined Alternative Analysis

The alternative analyses are restricted to either:

- Putting alternate technologies at sites other than the proposed site (e.g., at the Gabrych alternative).
- Putting alternate technologies at the proposed site.

Only one alternative analysis – geothermal – considers an alternate technology at an alternative site. Examples of other possible off-site/alternative technologies are putting a power tower installation, or using linear Fresnel, on the Gabrych site.

Another way of expressing this analysis deficiency is that it appears there has been no consideration of possible solutions combining other locations and other technologies. It appears highly likely that such an unrestricted alternative philosophy would uncover reasonable alternatives culminating in a better solution.

Rejections of Alternatives

Many alternative's Rationales for Elimination are obviously illogical, bringing to question the objectivity of the analyses. These illogical conclusions are in gross violation of NEPA requirements. Typical are:

- Gabrych: With no discussion or analysis of ownership, the alternative is eliminated because there are too many landowners, other than stating, without evidence, the number of landowners. No evidence is presented to qualify the situation or to justify the conclusion.
- Geothermal: Rejected illogically because 'few new projects have been proposed'. The analysis did not establish a connection between the viability of the alternative and the existence new project proposals,

probably because there is none. The conclusion is illogical on its surface.

A second reason for rejection is that geothermal is not in the list of Renewable Energy Portfolio projects that have requested ARRA funds. This implies that projects must use public money to be considered. Again no connection was made in the analysis, likely for the same reason – that there is no connection.

Note that neither of these rejection reasons is dependent on analysis of the technology, the site, or environmental impacts. Yet, the DEIS provided analysis, however brief and inadequate, despite its irrelevance to the rejection reason. This indicates cloudy thinking in the DEIS.

- Linear Fresnel is dismissed because it would not eliminate the significant impact of the proposed alternative. This criterion would also remove parabolic mirrors from consideration, since these do not eliminate significant impacts.
- Utility Scale Photovoltaic: Eliminated because California must have access to all types of renewable technologies. Not only does the analysis fail to discuss this reason, it defies imagination to understand the logic.

  Another reason for elimination is that water usage would be the same as the proposed project. The DEIS does not provide evidence that an alternative must be rejected if one of the impacts is the same as the proposed project, probably because it's not true.
- Biomass: Rejected because most biomass facilities are 3-10 MW. Again, no evidence was presented that rejection could be based on the size of 'most' biomass project.

These examples invite suspicion that parabolic mirrors are the prejudged as the only solution. The DEIS, however is not the proponent's sales brochure, and the purpose of the DEIS is not to promote the applicant's proposed solution or pretend it is better. The concept is in clear violation of the answer to Question 2b of NEPA's 40 questions (Exhibit 706). The applicant's proposed solution, in fact, must be better (or at least equal), to be preferred over other alternatives.

At the same time, at least one of the alternative analyses, Gabrych, appears to be well considered and as complete as could be expected as a'first look' at potential alternatives.

To preserve credibility, the inadequate sections should be corrected.

12) Gabrych Alternative

The extensive analysis in the DEIS for this alternative is appreciated.

Analysis in the DEIS shows that the Gabrych alternative, and by extension the Farmland Reserve, Sunland and other sites, are superior to the proposed site, and that they should be seriously considered as viable alternatives.

Levels of Impacts

The Gabrych alternative 'Summary of Impacts' lists the impacts that are similar, greater or lesser, without consideration of relative importance of the impact categories or degree of impact difference. It implies the decision be based on the number of categories with greater impact compared to the number of categories with lesser impact. But it does not explicitly make this comparison.

The table below uses a numeric score to measure degree of impact.

- The Summary of Impacts for the Gabrych alternative (page B.2-52) rates impact categories as either similar, greater than, or less than the proposed. Degree of impact difference is not described.
- The table below is a more sensitive measure than comparing the simple sum of categories that have greater or lesser impact.
- For categories with dissimilar impacts, the table estimates the degree of impact from the descriptions in the DEIS. Categories with similar impacts as stated in the Summary of Impacts paragraphs are ignored.
- The level of impact is judged on a 1-10 scale. Small difference is value 1. Huge difference is value 10. This variable is subjective.

Note: Page B.2-12 lists the impacts considered of greatest concern. They omit Visual, which surely should be in this category:

- Cultural Resources
- Biological Resources
- Soil & Water
- Cumulative impacts – visual, operational, land use (ag, recreational, wilderness, open space)

Impact Category	Comparison	Level (1-10)
The proposed site is preferred for these impact categories.		
Hazardous Materials	Potential impacts slightly greater at Gabrych, but Conditions of Certification result in no significant impacts.	1
Land Use	Gabrych: No BLM land, or CDCA amendment. Gabrych: Impact to ag land. LESA score 73 – adverse impact due to permanent conversion from agricultural. Not mentioned in the Comparison to Proposed Project are the various biological, cultural, visual and other losses from conversion of the proposed site to industrial. Also not mentioned is the cumulative impact recognized on C.6-2.	1
Noise, Vibration	Gabrych alternative … slightly greater impact (proximity to residences)	1
Visual Resources	Gabrych has more viewers, so greater visual impact	2
Transmission Line Safety & Nuisance	Proximity at Gabrych of transmission lines to 15 residences.	1
	Total	**6**

Impact Category	Comparison	Level (1-10)
The Gabrych alternative is preferred for these categories.		
Air Quality	The DEIS describes GHG emissions at the Gabrytch site, but not at the proposed site, so does not compare these. I presume they are the same. It's presumed the work force will live primarily in Blythe. The Gabrych site is closer to Blythe than the proposed site (12 vs. 20 miles). GHG due to commuting would be reduced at the Gabrych site. The summary of impacts section omitted commuting distance. I therefore changed this impact from similar to Gabrych preferred, by a small amount – level 1.	1
Recreation, Wilderness	DEIS Gabrych alternative states impacts to recreation would be slightly less at the Gabrych alternative. Not mentioned are impacts to Wilderness. Since the proposed project and the Palen-McCoy Wilderness share a common boundary, the visual, noise, solitude and other impacts to wilderness would be substantial. These considerations are omitted from the Comparison to Proposed Project section. The DEIS incorrectly states the Chuckwalla Valley Dune Thicket ACEC is closed to recreation. The June 15, 2001 Federal Register Notice (Exhibit 700) closes the area to vehicles. It does not mention other forms of recreation. This ACEC also has a common boundary with the proposed project. Impacts to the ACEC were not considered. Because of the omission of the impact to Wilderness and the ACEC, the level assigned is much higher that if only the 'slightly less' characterization were used alone.	5
Soil & Water	Terrain: both level. No difference. Water quality: With BMPs applied, no difference. Water conservation: Gabrych is preferred since dry cooling uses less water than current agriculture, returning water to the Colorado River system. This analysis assumes comparison with the staff recommended dry cooling at the proposed site. The Gabrych site would have no impact to Chuckwalla or Palen-McCoy Wind Transport Corridors.	3
Worker Safety, Fire Protection	Similar impacts, except emergency response time is shorter at the Gabrych site.	1

Impact Category	Comparison	Level (1-10)
The Gabrych alternative is preferred for these categories.		
Biological Resources	From the alternative analysis: ... *development of a solar project at the Gabrych Alternative site would impact fewer biological resources compared to the GSEP footprint because development of the alternative site would occur primarily on agricultural land, whereas development of the Proposed Project site would occur primarily on land supporting native vegetation communities.* ... *Colorado River supported riparian and undisturbed land, a small percentage of the area, should be avoided.* ... *If riparian and native habitats were avoided, development of a solar project on the Gabrych Alternative site would have fewer impacts to biological resources than development of a solar project on the Proposed Project site.*	4
Cultural Resources	From the alternatives analysis ... ***Proposed project**: Geoarchaeological studies of the Proposed Project indicate that the entire area is highly sensitive for buried cultural resources.* ... ***Gabrych**: 1905 acres of the 2138 acre area have been extensively agriculturally disturbed, destroying any surface component cultural resources.* ... *undiscovered subsurface sites are comparable* ... *impacts to potential, undiscovered subsurface archaeological sites at both the Gabrych Alternative and Proposed Project is comparable* ... *Gabrych Alternative would likely impact fewer surface cultural resources*	5
	Total	**19**

The DEIS considered impacts for these categories to be similar.	
Air Quality	The summary of impacts did not consider commuting distance. Air Quality was moved to the Gabrych preferred section.
Public Health & Safety	
Socioeconomics	
Traffic, Transportation	
Waste Management	
Facility Design	
Geology, Paleontology, Minerals	
Plant Efficiency	
Plant Reliability	
Transmission System Engineering	

This analysis shows the Gabrych site is preferred over the Plaster City site by a ratio of 19:6 = 3.1.

The advantages of the Gabrych alternative are sufficient that a more thorough analysis should be done involving, at a minimum:

- Cost analysis of site preparation and other factors compared to the proposed site.
- An estimate of the resource savings (time and money) by satisfying the environmental community, which has been urging solar facilities to locate on previous disturbed land, not open space. Choosing Gabrych would probably convert opponents to enthusiastic supporters.
- Savings by eliminating the requirement of a CDCA plan amendment.
- Possible financial return from the water rights that come with the property.

Other Properties

Acreage, fallow or productive, is continually available in the farming areas. A moderate amount of property has been fallowed from excessive salinity. The attraction, of course, is that it is previously disturbed and already in a highly impacted area – similar to the attractiveness of the Gabrych. It's highly probably that a contiguous tract of previously disturbed land of acceptable size could be put together. There is no evidence in the DEIS that a search for such property was done.

13) Private Land Alternative

The three paragraphs describing this alternative are confusing, to say the least. They are a jumble of disconnected facts and non-sequiturs, only sometimes coming to direct or implied conclusions. Following is an attempt to paraphrase:

Farmland Reserve and Sunworld.	Rejected by NextEra, which prefers wet cooling. The water would come from the Colorado River Basin, and might be denied
	CEC staff, however, considers dry cooling feasible and did not reject these. The fully analyzed Gabrych alternative is considered a surrogate, and so they were not analyzed separately.
	They cannot be considered since they are potential alternatives to the Blythe project.
Land north of Desert Center	Cannot be considered since it is an alternative to the Palen project. The Palen project calls this the North of Desert Center alternative.
Gabrych alternative	Analysed. The analysis is a surrogate for Farmland, Sunworld, and presumably North of Desert Center.

I could not find references to the Farmland Reserve and Sunworld properties in the Blythe DEIS. Computer search on the Blythe DEIS pdf file for both Farmland Reserve and Sunworld was unsuccessful. If indeed these are not Blythe alternatives, they should be considered as reasonable alternatives along with Gabrych.

14) Geothermal Energy

The Geothermal alternative analysis leads to the conclusion that geothermal is potentially a viable alternative, since it would have fewer environmental impacts. Analysis in more detail is warranted.

The stated rationale for elimination is not supported by the analysis. The discussion has irrelevant statements and statements unsupported by evidence. The analysis apparently has a fundamental flaw that would make geothermal much more attractive, if true.

Geothermal should be seriously considered as a realistic alternative.

Fundamental DEIS Analysis Flaw

There is potentially a fundamental flaw in the geothermal analysis. If the flaw exists, it would make geothermal even more attractive.

Geothermal plants have capacity factors far greater than concentrated solar since they can run 24/7. For equal energy output, an equivalent geothermal with a 90% capacity factor would need a capacity rating of a little more than one quarter of a CSP's capacity rating, since CSPs have capacity factors close to 25%. I could find no recognition of this in the analysis of the geothermal alternative. The narrative strongly implies comparison to a geothermal plant with 250 MW capacity. All references to geothermal size use '250 MW'.

Invalid Rationale for Elimination

The following uses a paraphrase of the Rationale for Elimination

Despite being commercially available, using less ground, having fewer impacts, and encouragement from the Renewable Portfolio Standard and ARRA funding, the alternative is rejected:

Rejection reason	Comment
Few new projects have been proposed	The reason is ludicrous. It implies that if not many new projects of a technology are proposed, the technology can't be considered. It does not allow old projects to serve as precedent. I have not found in the DEIS a requirement that a few new proposals for a technology must exist for the technology to be considered.
No geothermal projects are on the Renewable Energy Action Team list of projects that request ARRA funds.	A reference to provide authority for this statement is needed. I searched both the DEIS and google attempting to verify this requirement, with no success. I am skeptical that omission from a REAT list of projects requesting ARRA funds would eliminate consideration of the geothermal alternative to the proposed project. Such a requirement would preelude technologies that REAT has not happened to think of. It would indicate that projects not asking for public funding are not to be considered, that private funding is unacceptable.

Logical Inconsistencies

- In Geothermal Alternative Scenario:

  There is no single 250 MW geothermal project that would be viable as an alternative to the GSEP.

The relevance of this statement is not explained. It implies that since there is no such project, a project of that size cannot be considered. In fact, the English is flawed – it combines the absolute (is no) with conditional (would). The sentence is nonsensical.

- In the Geothermal Alternative Scenario paragraph

  Two hundred and fifty MW of geothermal energy could require the use of many thousands of acres of land.

  The 'could require' is not supported by evidence. No evidence is given. 'Many thousands of acres' applies equally to the proposed project. The statement comes to no conclusion. Simple replacement of 'could' with 'might not' would reverse the implication but not the validity. The statement is unsupported, meaningless and farcical.

Re-analysis Required

Because of these flaws the above analysis should be discarded and replaced with a rational analysis.

15) Linear Fresnel Technology

See page.

NEPA 1502.14(a) requires that the analysis "Rigorously explore and objectively evaluate all reasonable alternatives...".

With a little less than a page of analysis, the DEIS cannot be rigorous or include sufficient information to allow meaningful evaluation.

The analysis consists only of a general description of the technology. It then rejects the alternative since it would not eliminate significant impacts, despite requiring half the acreage (the analysis hints, but is not specific). The statement implies an alternative must eliminate, not merely reduce, significant impact to be considered. By this criteria, the proposed project would be rejected since it does not eliminate impacts, it only purports to reduce them to less than significant. Of course, the implication is absurd.

The brief description of linear Fresnel does not discuss impacts relative to the proposed project. It does not compare the alternative to the proposed project, in comparative or any other form as required by NEPA. Conclusions concerning relative merits of this alternative are therefore not possible.

The only mention of comparative impact is in the Rationale for Elimination, which states that linear Fresnel would use less land. It then dismisses linear Fresnel using the impact elimination argument discussed above.

The option cannot be eliminated with such sparse data and analysis. Indeed, it may very well be a viable alternative. The analysis in the DEIS should be discarded and replaced with a rational analysis.

16) Utility Scale Solar Photovoltaic

As with other alternative analyses, this violates the NEPA requirement to: "Rigorously explore and objectively evaluate all reasonable alternatives...". The analysis is not rigorous, and is not compared to the proposed alternative in comparative or any other form. The advantages of PV are intriguing. Impacts mentioned are of such wide range and speculative nature that no conclusion can be drawn. The comparisons that do exist are scattered and incomplete.

The Summary of Impact paragraph mentions development impacts only, not production impacts. It does mention glare and water requirements, but qualitatively only, and does not mention other impacts.

Most puzzling is the Rationale for Elimination. It states it is a viable technology, but then eliminates with this:

> *is not retained for analysis because, as stated above, in order for California to meet the renewable portfolio standards, it must have access to all types of renewable technologies.*

That California must have access to all types of renewable technologies is not a reason to eliminate this alternative. How would the proposed project be configured to satisfy this? Must the project use all types of technologies? All alternatives would be eliminated by this criterion, even the proposed project. The rationale is nonsense.

The last sentence in the Rationale for Elimination:

> *While a utility solar PV alternative would reduce impact from water used during cooling, the Dry Cooling Alternative, retained for consideration for this project would also eliminate this impact. Therefore, this alternative technology was eliminated from further consideration...*

The blatantly stated elimination reason here is that water impacts are the same (despite the text equating 'reduced' with 'eliminate'). No other impacts are cited. This implies a general rule: If one impact is the same, eliminate the alternative. Nonsense.

The Rationale for Elimination also categorically states '*...the extent of land required would be similar.*' The Executive Summary says the proposed project will disturb 1800 acres. The PV discussion says: '*250 MW solar power plant would require between 750 and 2,500 acres.*' Somehow the 1800 acres of the proposed project is has become similar to a range of 750-2500 acres. Worse, this statement is followed by '*Therefore solar PV would not eliminate the impacts of GSEP associated with ground disturbance*', implying that to be retained, an alternative's impact must **eliminate** GSEP's impact. Again, nonsense.

The analysis is lacking sufficient data or rigor to be considered valid. It is incomplete, not objective, and is in violation of, and not in the spirit of, NEPA. It must be done right. It looks like the author was reaching for a reason – any combination of words – that could end by concluding to eliminate the alternative.

PV might indeed be a viable alternative. It deserves a quality analysis as required by NEPA. The analysis in the DEIS should be discarded and replaced with a rational analysis.

17) Distributed Solar Technology

The Distributed Solar PV Systems section has a description of installations. The discussion does not give data that lead to comparison with GSEP in direct violation of NEPA requirements. No conclusions are stated – the analysis comes to no point and has no value for comparison with the proposed project.

No 'Rationale for Elimination' section is included, although the last paragraph appears to serve this purpose:

> *The conclusion of this section is that, while it will very likely be possible to achieve 250 MW of distributed solar energy over the coming years, the very limited numbers of existing facilities make it difficult to conclude with confidence that it will happen within the timeframe required for the GSEP project. As a result, this technology is eliminated from detailed analysis.*

Analysis of this spectacularly illogical conclusion:

Rationale for Elimination	Comment
... very limited number of installations...	No information about installation numbers has been given. PV installations are now common. More than 1800 Home / Rooftop installers are listed in California[2], and ads for home PV installation regularly run on the radio, in the LA Times and on freeway billboards. The implication that there is a small number of installations is both misleading and false.
... difficult to conclude with confidence that it will happen in the time frame...	This is a speculative statement. No information is given with respect to current and predicted rates of rooftop installation, installation response to financial incentives, cost projections. Certainly with the huge interest in solar, at least some data must exist. The statement is unsupportable, and enters the category of speculation.

The analysis in the DEIS should be discarded and replaced with a rational analysis in the spirit of the NEPA.

18) Wind Energy

The discussion in the alternative section is woefully inadequate.

Wind is a viable technology, used in a large number of places throughout the world, and so certainly is a possibility in this situation. Yet the DEIS analysis covers less than two pages, most of which is general to wind, not specific to this project. About a quarter of the space is allocated to a list of negative impacts, unsupported by analysis. There is no corresponding list of positive impacts. There is no comparison to GSEP.

Wind resources at the GSEP site are stated to be not viable. No supporting data is provided. The statement is speculative. It would be interesting to know if the site has been analyzed with met towers.

The San Gorgonio Pass description is interesting. It comes to no conclusion, and only weakly implies there is no room for another player. Other than curiosity, the paragraph is of no help without data, analysis of the data, and conclusions.

The discussion concludes with Rationale for Elimination:

> *While wind electricity generation is a viable and important renewable technology in California, it would not reduce the large-scale ground disturbance and visual impacts associated with the GSEP. Therefore wind generation was eliminated from further consideration.*

[2] Database of Solar Installers, Contractors, and Retailers in California: http://www.gosolarcalifornia.ca.gov/database/search-new.php

The reasoning implies that independent of other impacts, reduction of ground disturbance and visual impact are a requirement for consideration of an alternative.

The analysis in the DEIS should be discarded and replaced with a rational analysis.

19) Biomass

The biomass analysis has the same conceptual flaw as the geothermal analysis. Presuming biomass has a high capacity factor since it can run 24/7, the analysis ignores the capacity factor difference. The difference is probably on the order of 3:1 (75% for biomass to 25% for solar). From the biomass discussion in the DEIS:

> *Most biomass facilities produce only small amounts of electricity (in the range of 3 to 10 MW) and so could not meet the project objectives related to the California Renewable Portfolio Standard. In addition, between 25 and 80 facilities would be needed to achieve 250 MW of generation, creating substantial adverse impacts.*

The 250 MW capacity of the proposed project with 25% capacity factor would provide 67 MW actual output.

Twenty-three 3 MW biomass facilities at 75% capacity factor would be equivalent, not 80. Similarly, seven 10MW biomass facilities at 75% capacity factor would be equivalent, not 25. The number of biomass facilities needed is overstated by a factor of three. It appears this is an artifact of misrepresenting the project as generating 250 MW, as explained in the 'The 250 MW Rating is Incorrect' section.

The biomass analysis qualitatively lists positives and negatives. It does not quantify them, or compare them to the proposed alternative.

Advantages	Disadvantages
Locational flexibility increases siting options	Must be sited near a biomass source.
Small amounts of land are required.	Delivery truck noise.
	Grinding equipment and other noises.
	Emissions are unavoidable

Rationale for Elimination

> *Most biomass facilities produce only small amounts of electricity (in the range of 3 to 10 MW) and so could not meet project objectives.*

The reasoning does not support the rejection. The size of this biomass facility would be independent of the size of 'most biomass facilities'. That most biomass facilities are in the 3-10 MW range cannot be used to dismiss biomass in this instance. This facility could be larger than most, or multiple facilities could be used.

The statement requires that the distribution of facility sizes is skewed. If most are 3-10, and average is 21 (page B.2-75), then quite large biomass generators must exist to get the average so much larger than 'most'. Note that three average size 21 MW plants would be close to generating as much as the GSEG 250 MW plant running at 25% capacity factor, or 67 MW. Perhaps a single large size plant would generate as much as the GSEG.

The remainder of the elimination reason concerns air emissions only. No data are given to quantify the emissions.

No analysis of the balance of the 20 impacts considered is given. There is no comparison of impacts with the GSEG in comparative form as required by NEPA, or in any other form. Data supporting elimination is absent.

The analysis in the DEIS should be discarded and replaced with a rational analysis.

20) Exhibits

Exhibit 700, Dune Thicket Closure Fed Reg Notice.txt

Exhibit 701, NEPA - The National Environmental Policy Act of 1969.doc

Exhibit 702, Executive Order 13212.doc

Exhibit 703, Energy Policy Act of 2005.pdf

Exhibit 703-01, EPAct 2005, Front page.xps

Exhibit 703-02, EPAct 2005, Sense of Congress page.xps

Exhibit 704, Secretarial Order 3285.pdf

Exhibit 705, CEQ Authorization Memo.doc

Exhibit 706, CEQ 40 Questions, Questions 1-10.doc

Exhibit 707, CEQA 15126.6, Alternatives.pdf

Exhibit 708, 250MW Press Reports.pdf

Exhibit 709, Revised Staff Assessment.doc

END

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Proposed Order for Temporary Closure of Selected Routes of Travel or Areas in Imperial County, Riverside County, and San Bernardino County, CaliforniaNote: EPA no longer updates this information, but it may be useful as a reference or resource.

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[Notices]
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DEPARTMENT OF THE INTERIOR
Bureau of Land Management
[CA-610-01-1610-DL]

Proposed Order for Temporary Closure of Selected Routes of Travel or Areas in Imperial County, Riverside County, and San Bernardino County, California

AGENCY: Bureau of Land Management, Interior.

SUMMARY: Selected routes of travel or areas in two locations in the California Desert Conservation Area (CDCA) will be temporarily closed to vehicle use pursuant to 43 CFR 8364.1. The proposed closure is to provide interim protection for the desert tortoise, desert tortoise habitat, and other resource values from motorized vehicle use authorized under the CDCA Plan. By taking these interim actions, BLM contributes to the conservation of the endangered and threatened species in accordance with section 7(a) (1) of the Endangered Species Act (ESA). BLM also avoids making any irreversible or irretrievable commitment of resources which would foreclose any reasonable and prudent alternatives which might be required as a result of the consultation on the CDCA plan in accordance with 7(d) of the ESA. These closures will remain in effect until records of decision are signed for amendments to the CDCA Plan for the Northern and Eastern Colorado Desert and the West Mojave Desert.

The vehicle route closures are as follows: 1. In the Edwards Bowl area vehicle use is restricted to specified routes. 2. In two areas of desert tortoise critical habitat in the Northern and Eastern Colorado Desert (NECO) planning area vehicle use is restricted to specified routes.

Exceptions to the vehicle closures include Bureau of Land Management (BLM) operation and maintenance vehicles, law enforcement and fire vehicles, and other emergency vehicles.

The Orders for closure will be posted in the appropriate BLM Field Office and at places near and/or within the area to which the closure or restriction applies (see Field Offices at end of this Notice).

DATE: No sooner than July 16, 2001, Federal Register Orders of final closure will be published for each of the two areas.

ADDRESSES: Written comments may be sent to the appropriate Field Office, Attn: Route Closure, at the addresses listed below.

SUPPLEMENTARY INFORMATION: On March 16, 2000, the Center for Biological Diversity, and others (Center) filed for injunctive relief in U.S. District Court, Northern District of California (Court) against the Bureau of Land Management (BLM) alleging that the BLM was in violation of Section 7 of the Endangered Species Act (ESA) by failing to enter into formal consultation with the U.S. Fish and Wildlife Service (FWS) on the effects of adoption of the California Desert Conservation Area Plan (CDCA Plan), as amended, upon threatened and endangered species. On August 25, 2000, the BLM acknowledged through a court stipulation that activities authorized, permitted, or allowed under the CDCA Plan may adversely affect threatened and endangered species, and that the BLM is required to consult with the FWS to insure that adoption and implementation of the CDCA Plan is not likely to jeopardize the continued existence of threatened and endangered species or to result in the destruction or adverse modification of critical habitat of listed species.

Although BLM has received biological opinions on selected activities, consultation on the overall CDCA Plan is necessary to address the cumulative effects of all the activities authorized by the CDCA Plan. Consultation on the overall Plan is complex and the completion date is uncertain. Absent consultation on the entire Plan, the impacts of individual activities, when

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added together with the impacts of other activities in the desert are not known. The BLM entered into negotiations with plaintiffs regarding interim actions to be taken to provide protection for endangered and threatened species pending completion of the consultation on the CDCA Plan. Agreement on these interim actions avoided litigation of plaintiffs' request for injunctive relief and the threat of an injunction prohibiting all activities authorized under the Plan. These interim agreements have allowed BLM to continue to authorize appropriate levels of activities throughout the planning area during the lengthy consultation process while providing appropriate protection to the desert tortoise and other listed species in the short term. By taking interim actions as allowed under 43 CFR Part 8364.1, BLM contributes to the conservation of endangered and threatened species in accordance with 7(a)(1) of the ESA. BLM also avoids making any irreversible or irretrievable commitment of resources which would foreclose any reasonable and prudent alternative measures which might be required as a result of the consultation on the CDCA plan in accordance with 7(d) of the ESA. In January 2001, the parties signed the Stipulation and Proposed Order Concerning All Further Injunctive Relief and included the closures (paragraphs 40 and 43) described in this Notice.

All existing routes in the subject areas are being or will be evaluated and proposed for designation as Open, Closed, or Limited through the land use planning process as amendments to the California Desert Conservation Area Plan. These designations will be based on criteria identified in 43 CFR 8342.1. Management of routes proposed for closure will minimize the potential for any adverse effects pending designation.

The BLM Field Offices listed below have prepared environmental assessments (EA) which are available for a 15 day public review prior to publication of the final Federal Register Order. The beginning of the 15 day review for each EA may be different but all generally coincide with the publishing of this Notice. Interested parties should contact the Field Offices for the EAs and review dates.

In general, the EAs indicate the following reasons for each

closure:

Edwards Bowl: By reducing the size of the available route network and better controlling OHV use in the area, the potential for direct impacts to desert tortoise, Mojave ground squirrel, burrowing owl, and other species will be diminished. The proposed closure will help to prevent burrow collapse and species mortality caused by motorized vehicles. In addition the closure will have an overall positive impact on habitat by reducing soil loss and erosion and increasing vegetation regrowth and plant community establishment.

NECO Routes: The proposed closure will have a positive impact on many special status and other species. The proposed closure will reduce potential for significant adverse impacts to wildlife in critical seasons, such as when young are being reared. As desert tortoise commonly travel in washes and use the banks of washes for burrowing, restricting motorized vehicle use to specific routes and prohibiting use of certain washes within desert tortoise habitat management units 1 and 2 of the NECO plan will reduce tortoise mortality and crushing of burrows. The proposal will also provide added protection for other species including bighorn sheep, burro deer, several species of bats, prairie falcon, golden eagle Couch's spadefoot toad, and other species occurring in the area of the proposed closure.

The closures are described as follows:

1. Edwards Bowl (Barstow Field Office): The proposed route closures are north of the El Mirage Recreation Area and the town of Adelanto. The area covered by the closure will include all of the public lands within Sections 6, 7, 8, 16, 20 in T.8N., R.7W., San Bernardino Principle Meridian.

2. NECO Routes Areas (Palm Springs, Needles, El Centro Field Offices): The geographic center of Unit 1 is located about 35 miles southwest of Needles, California. It is generally bounded on the north by Interstate Highway 40; on the northeast by the Camino to U.S. Highway 95 powerline road; on the east by U.S. Highway 95, except that a portion of the Chemehuevi Valley east of Highway 95, and west and northwest of the Whipple Mountains Wilderness is included in the unit; on the southeast by the Colorado River Aqueduct; on the south by the northern end of the Turtle Mountains; on the southwest by the eastern flank of the Old Woman Mountains; and on the northwest by the western boundary of the Clipper Mountains Wilderness. The geographic center of Unit 2 is located about 50 miles east-southeast of Indio, California. It is generally bounded on the north by the southern boundary of Joshua Tree National Park and Interstate Highway 10; on the east by the southeast boundary of the Chuckwalla Mountains Wilderness and the lower northeastern boundary of the Chocolate Mountains Aerial Gunnery Range, though detached segments of the unit further to the east are comprised of the Little Chuckwalla Mountains Wilderness, a portion of the Palo Verde Mountains Wilderness, and the Chuckwalla Valley Dune Thicket Area of Critical Environmental Concern; and on the south and southwest by a line running southeast to northwest through the middle of the Chocolate Mountains Aerial Gunnery Range and extending to the boundary of Joshua Tree National Park.

FOR FURTHER INFORMATION CONTACT:

Edwards Bowl:

Barstow Field Office Manager, 2601 Barstow Road, Barstow, CA 92311, Tel: 760-252-6000.

NECO Routes:

El Centro Field Office Manager, 1661 So. 4th Street, El Centro, CA 92243, Tel: 760-337-4000.
Palm Springs-South Coast Field Office Manager, 690 W. Garnet Ave., P.O. Box 1260, North Palm Springs, CA 92258, Tel: 760-251-4800.

Needles Field Office Manager, 101 W. Spikes Rd., Needles, CA 92363, Tel: 760-326-7000.

Dated: June 8, 2001.
James Wesley Abbott,
Associate State Director.
[FR Doc. 01-15242 Filed 6-14-01; 8:45 am]
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The National Environmental Policy Act of 1969, as amended

(Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)

An Act to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Environmental Policy Act of 1969."

Purpose

Sec. 2 [42 USC § 4321].

The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

TITLE I

CONGRESSIONAL DECLARATION OF NATIONAL ENVIRONMENTAL POLICY

Sec. 101 [42 USC § 4331].

(a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consist with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

Exhibit 701
NEPA - The National Environmental Policy Act of 1969

6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 102 [42 USC § 4332].

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall --

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this Act; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by title II of this Act.

Sec. 103 [42 USC § 4333].

All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act.

Sec. 104 [42 USC § 4334].

Nothing in section 102 [42 USC § 4332] or 103 [42 USC § 4333] shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

Sec. 105 [42 USC § 4335].

The policies and goals set forth in this Act are supplementary to those set forth in existing authorizations of Federal agencies.

TITLE II

COUNCIL ON ENVIRONMENTAL QUALITY

Sec. 201 [42 USC § 4341].

The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban an rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Sec. 202 [42 USC § 4342].

There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in title I of this Act; to be conscious of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Sec. 203 [42 USC § 4343].

(a) The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of title 5, United States Code (but without regard to the last sentence thereof).

(b) Notwithstanding section 1342 of Title 31, the Council may accept and employ voluntary and uncompensated services in furtherance of the purposes of the Council.

Sec. 204 [42 USC § 4344].

It shall be the duty and function of the Council --

1. to assist and advise the President in the preparation of the Environmental Quality Report required by section 201 [42 USC § 4341] of this title;
2. to gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;

3. to review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;
4. to develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation;
5. to conduct investigations, studies, surveys, research, and analyses relating to ecological systems and environmental quality;
6. to document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;
7. to report at least once each year to the President on the state and condition of the environment; and
8. to make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

Sec. 205 [42 USC § 4345].

In exercising its powers, functions, and duties under this Act, the Council shall --

1. consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order No. 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and
2. utilize, to the fullest extent possible, the services, facilities and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Sec. 206 [42 USC § 4346].

Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates [5 USC § 5313]. The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates [5 USC § 5315].

Sec. 207 [42 USC § 4346a].

The Council may accept reimbursements from any private nonprofit organization or from any department, agency, or instrumentality of the Federal Government, any State, or local government, for the reasonable travel expenses incurred by an officer or employee of the Council in connection with his attendance at any conference, seminar, or similar meeting conducted for the benefit of the Council.

Sec. 208 [42 USC § 4346b].

The Council may make expenditures in support of its international activities, including expenditures for: (1) international travel; (2) activities in implementation of international agreements; and (3) the support of international exchange programs in the United States and in foreign countries.

Sec. 209 [42 USC § 4347].

There are authorized to be appropriated to carry out the provisions of this chapter not to exceed $300,000 for fiscal year 1970, $700,000 for fiscal year 1971, and $1,000,000 for each fiscal year thereafter.

The Environmental Quality Improvement Act, as amended (Pub. L. No. 91- 224, Title II, April 3, 1970; Pub. L. No. 97-258, September 13, 1982; and Pub. L. No. 98-581, October 30, 1984.

42 USC § 4372.

(a) There is established in the Executive Office of the President an office to be known as the Office of Environmental Quality (hereafter in this chapter referred to as the "Office"). The Chairman of the Council on Environmental Quality established by Public Law 91-190 shall be the Director of the Office. There shall be in the Office a Deputy Director who shall be appointed by the President, by and with the advice and consent of the Senate.

(b) The compensation of the Deputy Director shall be fixed by the President at a rate not in excess of the annual rate of compensation payable to the Deputy Director of the Office of Management and Budget.

(c) The Director is authorized to employ such officers and employees (including experts and consultants) as may be necessary to enable the Office to carry out its functions ;under this chapter and Public Law 91-190, except that he may employ no more than ten specialists and other experts without regard to the provisions of Title 5, governing appointments in the competitive service, and pay such specialists and experts without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, but no such specialist or expert shall be paid at a rate in excess of the maximum rate for GS-18 of the General Schedule under section 5332 of Title 5.

(d) In carrying out his functions the Director shall assist and advise the President on policies and programs of the Federal Government affecting environmental quality by --

1. providing the professional and administrative staff and support for the Council on Environmental Quality established by Public Law 91- 190;
2. assisting the Federal agencies and departments in appraising the effectiveness of existing and proposed facilities, programs, policies, and activities of the Federal Government, and those specific major projects designated by the President which do not require individual project authorization by Congress, which affect environmental quality;
3. reviewing the adequacy of existing systems for monitoring and predicting environmental changes in order to achieve effective coverage and efficient use of research facilities and other resources;
4. promoting the advancement of scientific knowledge of the effects of actions and technology on the environment and encouraging the development of the means to prevent or reduce adverse effects that endanger the health and well-being of man;
5. assisting in coordinating among the Federal departments and agencies those programs and activities which affect, protect, and improve environmental quality;
6. assisting the Federal departments and agencies in the development and interrelationship of environmental quality criteria and standards established throughout the Federal Government;
7. collecting, collating, analyzing, and interpreting data and information on environmental quality, ecological research, and evaluation.

(e) The Director is authorized to contract with public or private agencies, institutions, and organizations and with individuals without regard to section 3324(a) and (b) of Title 31 and section 5 of Title 41 in carrying out his functions.

42 USC § 4373. Each Environmental Quality Report required by Public Law 91-190 shall, upon transmittal to Congress, be referred to each standing committee having jurisdiction over any part of the subject matter of the Report.

42 USC § 4374. There are hereby authorized to be appropriated for the operations of the Office of Environmental Quality and the Council on Environmental Quality not to exceed the following sums for the following fiscal years which sums are in addition to those contained in Public Law 91- 190:

(a) $2,126,000 for the fiscal year ending September 30, 1979.

(b) $3,000,000 for the fiscal years ending September 30, 1980, and September 30, 1981.

(c) $44,000 for the fiscal years ending September 30, 1982, 1983, and 1984.

(d) $480,000 for each of the fiscal years ending September 30, 1985 and 1986.

42 USC § 4375.

(a) There is established an Office of Environmental Quality Management Fund (hereinafter referred to as the "Fund") to receive advance payments from other agencies or accounts that may be used solely to finance --

1. study contracts that are jointly sponsored by the Office and one or more other Federal agencies; and
2. Federal interagency environmental projects (including task forces) in which the Office participates.

(b) Any study contract or project that is to be financed under subsection (a) of this section may be initiated only with the approval of the Director.

(c) The Director shall promulgate regulations setting forth policies and procedures for operation of the Fund.

Exhibit 702
Executive Order 13212

Executive Order 13212: 66 FR 28357 (22 May 2001)
Executive Order 13212--Actions To Expedite Energy

May 18, 2001

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to take additional steps to expedite the increased supply and availability of energy to our Nation, it is hereby ordered as follows:

Section 1. Policy.

The increased production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people. In general, it is the policy of this Administration that executive departments and agencies (agencies) shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.

Sec. 2. Actions to Expedite Energy-Related Projects.

For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation, and where appropriate.

Sec. 3. Interagency Task Force.

There is established an interagency task force (Task Force) to monitor and assist the agencies in their efforts to expedite their review of permits or similar actions, as necessary, to accelerate the completion of energy-related projects, increase energy production and conservation, and improve transmission of energy. The Task Force also shall monitor and assist agencies in setting up appropriate mechanisms to coordinate Federal, State, tribal, and local permitting in geographic areas where increased permitting activity is expected. The Task Force shall be composed of representatives from the Departments of State, the Treasury, Defense, Agriculture, Housing and Urban Development, Justice, Commerce, Transportation, the Interior, Labor, Education, Health and Human Services, Energy, Veterans Affairs, the Environmental Protection Agency, Central Intelligence Agency, General Services Administration, Office of Management and Budget, Council of Economic Advisers, Domestic Policy Council, National Economic Council, and such other representatives as may be determined by the Chairman of the Council on Environmental Quality. The Task Force shall be chaired by the Chairman of the Council on Environmental Quality and housed at the Department of Energy for administrative purposes.

Sec. 4. Judicial Review.

Nothing in this order shall affect any otherwise available judicial review of agency action. This order is intended only to improve the internal management of the Federal Government and does not create any right or benefit, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

George W. Bush

The White House,
May 18, 2001.

PUBLIC LAW 109–58—AUG. 8, 2005

ENERGY POLICY ACT OF 2005

Exhibit 703
Energy Policy Act of 2005

(e) REPORT.—Not later than October 1, 2010, the Secretary of Agriculture, in consultation with the Secretary of the Interior, shall submit to the Committee on Energy and Natural Resources and the Committee on Agriculture, Nutrition, and Forestry of the Senate, and the Committee on Resources, the Committee on Energy and Commerce, and the Committee on Agriculture of the House of Representatives, a report describing the results of the grant programs authorized by this section. The report shall include the following:

(1) An identification of the size, type, and use of biomass by persons that receive grants under this section.

(2) The distance between the land from which the biomass was removed and the facility that used the biomass.

(3) The economic impacts, particularly new job creation, resulting from the grants to and operation of the eligible operations.

SEC. 211. SENSE OF CONGRESS REGARDING GENERATION CAPACITY OF ELECTRICITY FROM RENEWABLE ENERGY RESOURCES ON PUBLIC LANDS.

It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity.

Subtitle B—Geothermal Energy

John Rishel Geothermal Steam Act Amendments of 2005.
30 USC 1001 note.

SEC. 221. SHORT TITLE.

This subtitle may be cited as the "John Rishel Geothermal Steam Act Amendments of 2005".

SEC. 222. COMPETITIVE LEASE SALE REQUIREMENTS.

Section 4 of the Geothermal Steam Act of 1970 (30 U.S.C. 1003) is amended to read as follows:

"SEC. 4. LEASING PROCEDURES.

"(a) NOMINATIONS.—The Secretary shall accept nominations of land to be leased at any time from qualified companies and individuals under this Act.

"(b) COMPETITIVE LEASE SALE REQUIRED.—

"(1) IN GENERAL.—Except as otherwise specifically provided by this Act, all land to be leased that is not subject to leasing under subsection (c) shall be leased as provided in this subsection to the highest responsible qualified bidder, as determined by the Secretary.

"(2) COMPETITIVE LEASE SALES.—The Secretary shall hold a competitive lease sale at least once every 2 years for land in a State that has nominations pending under subsection (a) if the land is otherwise available for leasing.

"(3) LANDS SUBJECT TO MINING CLAIMS.—Lands that are subject to a mining claim for which a plan of operations has been approved by the relevant Federal land management agency may be available for noncompetitive leasing under this section to the mining claim holder.

"(c) NONCOMPETITIVE LEASING.—The Secretary shall make available for a period of 2 years for noncompetitive leasing any

THE SECRETARY OF THE INTERIOR

WASHINGTC

Exhibit 704
Secretarial Order 3285

ORDER NO. 3285

Subject: Renewable Energy Development by the Department of the Interior

Sec. 1 **Purpose.** This Order establishes the development of renewable energy as a priority for the Department of the Interior and establishes a Departmental Task Force on Energy and Climate Change. This Order also amends and clarifies Departmental roles and responsibilities to accomplish this goal.

Sec. 2 **Background.** The Nation faces significant challenges to meeting its current and future energy needs. Meeting these challenges will require strategic planning and a thoughtful, balanced approach to domestic resource development that calls upon the coordinated development of renewable resources, as well as the development of traditional energy resources. Many of our public lands possess substantial renewable resources that will help meet our Nation's future energy needs while also providing significant benefits to our environment and the economy. Increased production of renewable energy will create jobs, provide cleaner, more sustainable alternatives to traditional energy resources, and enhance the energy security of the United States by adding to the domestic energy supply. As the steward of more than one-fifth of our Nation's lands, and neighbor to other land managers, the Department of the Interior has a significant role in coordinating and ensuring environmentally responsible renewable energy production and development of associated infrastructure needed to deliver renewable energy to the consumer.

Sec. 3 **Authority.** This Order is issued under the authority of Section 2 of Reorganization Plan No. 3 of 1950 (64 Stat. 1262), as amended, and pursuant to the provisions of Section 211 of the Energy Policy Act of 2005 (P.L. 109-58).

Sec. 4 **Policy.** Encouraging the production, development, and delivery of renewable energy is one of the Department's highest priorities.. Agencies and bureaus within the Department will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission while protecting and enhancing the Nation's water, wildlife, and other natural resources.

Sec. 5 **Energy and Climate Change Task Force.** A Task Force on Energy and Climate Change is hereby established in the Department. The Deputy Secretary and the Counselor to the Secretary shall serve as Co-Chairs. The Task Force on Energy and Climate Change shall:

a. develop a strategy that is designed to increase the development and transmission of renewable energy from appropriate areas on public lands and the Outer Continental Shelf, including the following:

(1) quantifying potential contributions of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy;

(2) identifying and prioritizing the specific locations in the United States best suited for large-scale production of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy (e.g., renewable energy zones);

(3) identifying, in cooperation with other agencies of the United States and appropriate state agencies, the electric transmission infrastructure and transmission corridors needed to deliver these renewable resources to major population centers;

(4) prioritizing the permitting and appropriate environmental review of transmission rights-of-way applications that are necessary to deliver renewable energy generation to consumers;

(5) establishing clear roles and processes for each bureau/office;

(6) tracking bureau/office progress and working to identify and resolve obstacles to renewable energy permitting, siting, development, and production;

(7) identifying additional policies and/or revisions to existing policies or practices that are needed, including possible revisions to the Geothermal, Wind, and West-Wide Corridors Programmatic Environmental Impact Statements and their respective Records of Decisions; and

(8) working with individual states, tribes, local governments, and other interested stakeholders, including renewable generators and transmission and distribution utilities, to identify appropriate areas for generation and necessary transmission;

b. develop best management practices for renewable energy and transmission projects on the public lands to ensure the most environmentally responsible development and delivery of renewable energy;

c. establish clear policy direction for authorizing the development of solar energy on public lands; and

d. recommend such other actions as may be necessary to fulfill the goals of this Order.

Sec. 6 **Responsibilities.**

a. Program Assistant Secretaries. Program Assistant Secretaries overseeing bureaus responsible for, or that provide assistance with, the planning, siting, or permitting of renewable energy generation and transmission facilities on the public lands and on the Outer Continental Shelf, are responsible for:

(1) establishing and participating in management structures that facilitate cooperation, reporting, and accountability across agencies, including the Task Force on Energy and Climate Change;

(2) establishing joint, single-point-of contact offices that consolidate expertise to ensure a coordinated, efficient, and expeditious permitting process while ensuring appropriate siting and compliance with the National Environmental Policy Act, the Endangered Species Act, and all other applicable laws; and

(3) working collaboratively with other departments, state, and local authorities to coordinate and harmonize non-Federal permitting processes.

b. The Assistant Secretary - Policy, Management and Budget is a member of the Task Force and shall:

(1) ensure that investments associated with Interior managed facilities meet Federal standards for energy efficiency and greening applications; and

(2) coordinate with the Energy and Climate Change Task Force, as appropriate.

c. Bureau Heads. Each bureau head is responsible for designating a representative to the Task Force on Energy and Climate Change.

Sec. 7 **Implementation**. The Deputy Secretary is responsible for ensuring implementation of this Order. This responsibility may be delegated as appropriate.

Sec. 8 **Effective Date**. This Order is effective immediately and will remain in effect until its provisions are converted to the Departmental Manual or until it is amended, superseded, or revoked, whichever comes first. The termination of this Order will not nullify implementation of the requirements and responsibilities effected herein.

Ken Salazar

Secretary of the Interior

Date: 3/11/2009

MEMORANDUM FOR FEDERAL NEPA LIAISONS, FEDERAL, STATE, AND LOCAL OFFICIALS AND OTHER PERSONS INVOLVED IN THE NEPA PROCESS

Subject: Questions and Answers About the NEPA Regulations

During June and July of 1980 the Council on Environmental Quality, with the assistance and cooperation of EPA's EIS Coordinators from the ten EPA regions, held one-day meetings with federal, state and local officials in the ten EPA regional offices around the country. In addition, on July 10, 1980, CEQ conducted a similar meeting for the Washington, D.C. NEPA liaisons and persons involved in the NEPA process. At these meetings CEQ discussed (a) the results of its 1980 review of Draft EISs issued since the July 30, 1979 effective date of the NEPA regulations, (b) agency compliance with the Record of Decision requirements in Section 1505 of the NEPA regulations, and (c) CEQ's preliminary findings on how the scoping process is working. Participants at these meetings received copies of materials prepared by CEQ summarizing its oversight and findings.

These meetings also provided NEPA liaisons and other participants with an opportunity to ask questions about NEPA and the practical application of the NEPA regulations. A number of these questions were answered by CEQ representatives at the regional meetings. In response to the many requests from the agencies and other participants, CEQ has compiled forty of the most important or most frequently asked questions and their answers and reduced them to writing. The answers were prepared by the General Counsel of CEQ in consultation with the Office of Federal Activities of EPA. These answers, of course, do not impose any additional requirements beyond those of the NEPA regulations. This document does not represent new guidance under the NEPA regulations, but rather makes generally available to concerned agencies and private individuals the answers which CEQ has already given at the 1980 regional meetings. The answers also reflect the advice which the Council has given over the past two years to aid agency staff and consultants in their day-to-day application of NEPA and the regulations.

CEQ has also received numerous inquiries regarding the scoping process. CEQ hopes to issue written guidance on scoping later this year on the basis of its special study of scoping, which is nearing completion.

NICHOLAS C. YOST
General Counsel

Exhibit 705
CEQ Authorization Memo

Exhibit 706
CEQ 40 Questions, Questions 1-10

NEPA's Forty Most Asked Questions
Questions 1-10

1a. Range of Alternatives. What is meant by "range of alternatives" as referred to in Sec. 1505.1(e)?

A. The phrase "range of alternatives" refers to the alternatives discussed in environmental documents. It includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them. Section 1502.14. A decisionmaker must not consider alternatives beyond the range of alternatives discussed in the relevant environmental documents. Moreover, a decisionmaker must, in fact, consider all the alternatives discussed in an EIS. Section 1505.1(e).

1b. **How many alternatives** have to be discussed when there is an infinite number of possible alternatives?

A. For some proposals there may exist a very large or even an infinite number of possible reasonable alternatives. For example, a proposal to designate wilderness areas within a National Forest could be said to involve an infinite number of alternatives from 0 to 100 percent of the forest. When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be analyzed and compared in the EIS. An appropriate series of alternatives might include dedicating 0, 10, 30, 50, 70, 90, or 100 percent of the Forest to wilderness. What constitutes a reasonable range of alternatives depends on the nature of the proposal and the facts in each case.

2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?

A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?

A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).

3. No-Action Alternative. What does the "no action" alternative include? If an agency is under a court order or legislative command to act, must the EIS address the "no action" alternative?

A. Section 1502.14(d) requires the alternatives analysis in the EIS to "include the alternative of no action." There are two distinct interpretations of "no action" that must be considered, depending on the nature of the proposal being evaluated. The first situation might involve an action such as updating a land management plan where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases "no action" is "no change" from current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed. Consequently, projected impacts of alternative management schemes would be compared in the EIS to those impacts projected for the existing plan. In this case, alternatives would include management plans of both greater and lesser intensity, especially greater and lesser levels of resource development.

The second interpretation of "no action" is illustrated in instances involving federal decisions on proposals for projects. "No action" in such cases would mean the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

Where a choice of "no action" by the agency would result in predictable actions by others, this consequence of the "no action" alternative should be included in the analysis. For example, if denial of permission to build a railroad to a facility would lead to construction of a road and increased truck traffic, the EIS should analyze this consequence of the "no action" alternative.

In light of the above, it is difficult to think of a situation where it would not be appropriate to address a "no action" alternative. Accordingly, the regulations require the analysis of the no action alternative even if the agency is under a court order or legislative command to act. This analysis provides a benchmark, enabling decisionmakers to compare the magnitude of environmental effects of the action alternatives. It is also an example of a reasonable alternative outside the jurisdiction of the agency which must be analyzed. Section 1502.14(c). See Question 2 above. Inclusion of such an analysis in the EIS is necessary to inform the Congress, the public, and the President as intended by NEPA. Section 1500.1(a).

4a. Agency's Preferred Alternative. What is the "agency's preferred alternative"?

A. The "agency's preferred alternative" is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. The concept of the "agency's preferred alternative" is different from the "environmentally preferable alternative," although in some cases one alternative may be both. See Question 6 below. It is identified so that agencies and the public can understand the lead agency's orientation.

4b. Does the "preferred alternative" have to be identified in the Draft EIS and the Final EIS or just in the Final EIS?

A. Section 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement . . ." This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS. If the responsible federal official in fact has no preferred alternative at the Draft EIS stage, a preferred alternative need not be identified there. By the time the Final EIS is filed, Section 1502.14(e) presumes the existence of a preferred alternative and requires its identification in the Final EIS "unless another law prohibits the expression of such a preference."

4c. Who recommends or determines the "preferred alternative?"

A. The lead agency's official with line responsibility for preparing the EIS and assuring its adequacy is responsible for identifying the agency's preferred alternative(s). The NEPA regulations do not dictate which official in an agency shall be responsible for preparation of EISs, but agencies can identify this official in their implementing procedures, pursuant to Section 1507.3.

Even though the agency's preferred alternative is identified by the EIS preparer in the EIS, the statement must be objectively prepared and not slanted to support the choice of the agency's preferred alternative over the other reasonable and feasible alternatives.

5a. Proposed Action v. Preferred Alternative. Is the "proposed action" the same thing as the "preferred alternative"?

A. The "proposed action" may be, but is not necessarily, the agency's "preferred alternative." The proposed action may be a proposal in its initial form before undergoing analysis in the EIS process. If the proposed action is [46 FR 18028] internally generated, such as preparing a land management plan, the proposed action might end up as the agency's preferred alternative. On the other hand the proposed action may be granting an application to a non-federal entity for a permit. The agency may or may not have a "preferred alternative" at the Draft EIS stage (see Question 4 above). In that case the agency may decide at the Final EIS stage, on the basis of the Draft EIS and the public and agency comments, that an alternative other than the proposed action is the agency's "preferred alternative."

5b. Is the analysis of the "proposed action" in an EIS to be treated differently from the analysis of alternatives?

A. The degree of analysis devoted to each alternative in the EIS is to be substantially similar to that devoted to the "proposed action." Section 1502.14 is titled "Alternatives including the proposed action" to reflect such comparable treatment. Section 1502.14(b) specifically requires "substantial treatment" in the EIS of each alternative including the proposed action. This regulation does not dictate an amount of information to be provided, but rather, prescribes a level of treatment, which may in turn require varying amounts of information, to enable a reviewer to evaluate and compare alternatives.

6a. Environmentally Preferable Alternative. What is the meaning of the term "environmentally preferable alternative" as used in the regulations with reference to Records of Decision? How is the term "environment" used in the phrase?

A. Section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision (ROD) must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

The Council recognizes that the identification of the environmentally preferable alternative may involve difficult judgments, particularly when one environmental value must be balanced against another. The public and other agencies reviewing a Draft EIS can assist the lead agency to develop and determine environmentally preferable alternatives by providing their views in comments on the Draft EIS. Through the identification of the environmentally preferable alternative, the decisionmaker is clearly faced with a choice between that alternative and others, and must consider whether the decision accords with the Congressionally declared policies of the Act.

6b. Who recommends or determines what is environmentally preferable?

A. The agency EIS staff is encouraged to make recommendations of the environmentally preferable alternative(s) during EIS preparation. In any event the lead agency official responsible for the EIS is encouraged to identify the environmentally preferable alternative(s) in the EIS. In all cases, commentors from other agencies and the public are also encouraged to address this question. The agency must identify the environmentally preferable alternative in the ROD.

7. Difference Between Sections of EIS on Alternatives and Environmental Consequences. What is the difference between the sections in the EIS on "alternatives" and "environmental consequences"? How do you avoid duplicating the discussion of alternatives in preparing these two sections?

A. The "alternatives" section is the heart of the EIS. This section rigorously explores and objectively evaluates all reasonable alternatives including the proposed action. Section 1502.14. It should include relevant comparisons on environmental and other grounds. The "environmental consequences" section of the EIS discusses the specific environmental impacts or effects of each of the alternatives including the proposed action. Section 1502.16. In order to avoid duplication between these two sections, most of the "alternatives" section should be devoted to describing and comparing the alternatives. Discussion of the environmental impacts of these alternatives should be limited to a concise descriptive summary of such impacts in a comparative form, including charts or tables, thus sharply defining the issues and providing a clear basis for choice among options. Section 1502.14. The "environmental consequences" section should be devoted largely to a scientific analysis of the direct and indirect environmental effects of the proposed action and of each of the alternatives. It forms the analytic basis for the concise comparison in the "alternatives" section.

8. Early Application of NEPA. Section 1501.2(d) of the NEPA regulations requires agencies to provide for the early application of NEPA to cases where actions are planned by private applicants or non-Federal entities and are, at some stage, subject to federal approval of permits, loans, loan guarantees, insurance or other actions. What must and can agencies do to apply NEPA early in these cases?

A. Section 1501.2(d) requires federal agencies to take steps toward ensuring that private parties and state and local entities initiate environmental studies as soon as federal involvement in their proposals can be foreseen. This section is intended to ensure that environmental factors are considered at an early stage in the planning process and to avoid the situation where the applicant for a federal permit or approval has completed planning and eliminated all alternatives to the proposed action by the time the EIS process commences or before the EIS process has been completed.

Through early consultation, business applicants and approving agencies may gain better appreciation of each other's needs and foster a decisionmaking process which avoids later unexpected confrontations.

Federal agencies are required by Section 1507.3(b) to develop procedures to carry out Section 1501.2(d). The procedures should include an "outreach program", such as a means for prospective applicants to conduct pre-application consultations with the lead and cooperating agencies. Applicants need to find out, in advance of project planning, what environmental studies or other information will be required, and what mitigation requirements are likely, in connecton with the later federal NEPA process. Agencies should designate staff to advise potential applicants of the agency's NEPA information requirements and should publicize their pre-application procedures and information requirements in newsletters or other media used by potential applicants.

Complementing Section 1501.2(d), Section 1506.5(a) requires agencies to assist applicants by outlining the types of information required in those cases where the agency requires the applicant to submit environmental data for possible use by the agency in preparing an EIS.

Section 1506.5(b) allows agencies to authorize preparation of environmental assessments by applicants. Thus, the procedures should also include a means for anticipating and utilizing applicants' environmental studies or "early corporate environmental assessments" to fulfill some of the federal agency's NEPA obligations. However, in such cases the agency must still evaluate independently the environmental issues [46 FR 18029] and take responsibility for the environmental assessment.

These provisions are intended to encourage and enable private and other non-federal entities to build environmental considerations into their own planning processes in a way that facilitates the application of NEPA and avoids delay.

9. Applicant Who Needs Other Permits. To what extent must an agency inquire into whether an applicant for a federal permit, funding or other approval of a proposal will also need approval from another agency for the same proposal or some other related aspect of it?

A. Agencies must integrate the NEPA process into other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts. Specifically, the agency must "provide for cases where actions are planned by . . . applicants," so that designated staff are available to advise potential applicants of studies or other information that will foreseeably be required for the later federal action; the agency shall consult with the applicant if the agency foresees its own involvement in the proposal; and it shall insure that the NEPA process commences at the earliest possible time. Section 1501.2(d). (See Question 8.)

The regulations emphasize agency cooperation early in the NEPA process. Section 1501.6. Section 1501.7 on "scoping" also provides that all affected Federal agencies are to be invited to participate in scoping the environmental issues and to identify the various environmental review and consultation requirements that may apply to the proposed action. Further, Section 1502.25(b) requires that the draft EIS list all the federal permits, licenses and other entitlements that are needed to implement the proposal.

These provisions create an affirmative obligation on federal agencies to inquire early, and to the maximum degree possible, to ascertain whether an applicant is or will be seeking other federal assistance or approval, or whether the applicant is waiting until a proposal has been substantially developed before requesting federal aid or approval.

Thus, a federal agency receiving a request for approval or assistance should determine whether the applicant has filed separate requests for federal approval or assistance with other federal agencies. Other federal agencies that are likely to become involved should then be contacted, and the NEPA process coordinated, to insure an early and comprehensive analysis of the direct and indirect effects of the proposal and any related actions. The agency should inform the applicant that action on its application may be delayed unless it submits all other federal applications (where feasible to do so), so that all the relevant agencies can work together on the scoping process and preparation of the EIS.

10a. Limitations on Action During 30-Day Review Period for Final EIS. What actions by agencies and/or applicants are allowed during EIS preparation and during the 30-day review period after publication of a final EIS?

A. No federal decision on the proposed action shall be made or recorded until at least 30 days after the publication by EPA of notice that the particular EIS has been filed with EPA. Sections 1505.2 and 1506.10. Section 1505.2 requires this decision to be stated in a public Record of Decision.

Until the agency issues its Record of Decision, no action by an agency or an applicant concerning the proposal shall be taken which would have an adverse environmental impact or limit the choice of reasonable alternatives. Section 1506.1(a). But this does not preclude preliminary planning or design work which is needed to support an application for permits or assistance. Section 1506.1(d).

When the impact statement in question is a program EIS, no major action concerning the program may be taken which may significantly affect the quality of the human environment, unless the particular action is justified independently of the program, is accompanied by its own adequate environmental impact statement and will not prejudice the ultimate decision on the program. Section 1506.1(c).

10b. Do these limitations on action (described in Question 10a) apply to state or local agencies that have statutorily delegated responsibility for preparation of environmental documents required by NEPA, for example, under the HUD Block Grant program?

A. Yes, these limitations do apply, without any variation from their application to federal agencies.

(c) Mitigation Measures Related to Greenhouse Gas Emissions.

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

(1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

(2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;

(3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;

(4) Measures that sequester greenhouse gases;

(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

Note: Authority cited: Sections 21083, 21083.05, Public Resources Code. Reference: Sections 5020.5, 21002, 21003, 21083.05, 21100 and 21084.1, Public Resources Code; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553; *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Laurel Heights Improvement Association v. Regents of the University of California* (1993) 6 Cal.4th 1112; ~~and~~ *Sacramento Old City Assn. v. City Council of Sacramento* (1991) 229 Cal.App.3d 1011; *San Franciscans Upholding the Downtown Plan v. City & Co. of San Francisco* (2002) 102 Cal.App.4th 656; *Ass'n of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383; *Environmental Council of Sacramento v. City of Sacramento* (2006) 147 Cal.App.4th 1018.

15126.6 CONSIDERATION AND DISCUSSION OF ALTERNATIVES TO THE PROPOSED PROJECT.

(a) Alternatives to the Proposed Project. An EIR shall 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 but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553 and *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal.3d 376).

(b) Purpose. Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

Exhibit 707

 CEQA 15126.6, Alternatives

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(c) Selection of a range of reasonable alternatives. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are:(i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

(d) Evaluation of alternatives. The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed. (*County of Inyo v. City of Los Angeles* (1981) 124 Cal.App.3d 1).

(e) "No project" alternative.

(1) The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).

(2) The "no project" analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

(3) A discussion of the "no project" alternative will usually proceed along one of two lines:

(A) When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the "no project" alternative will be the continuation of the existing plan, policy or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan.

(B) If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis

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should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

(C) After defining the no project alternative using one of these approaches, the lead agency should proceed to analyze the impacts of the no project alternative by projecting what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

(f) Rule of reason. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

(1) Feasibility. Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553; see *Save Our Residential Environment v. City of West Hollywood* (1992) 9 Cal.App.4th 1745, 1753, fn. 1).

(2) Alternative locations.

(A) Key question. The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.

(B) None feasible. If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. For example, in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location.

(C) Limited new analysis required. Where a previous document has sufficiently analyzed a range of reasonable alternative locations and environmental impacts for projects with the same basic purpose, the lead agency should review the previous document. The EIR may rely on the previous document to help it assess the feasibility of potential project alternatives to the extent the circumstances remain substantially the same as they relate to the alternative. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 573).

(3) An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. (*Residents Ad Hoc Stadium Committee v. Board of Trustees* (1979) 89 Cal. App.3d 274).

Note: Authority cited: Section 21083, Public Resources Code. Reference: Sections 21002, 21002.1, 21003, and 21100, Public Resources Code; *Citizens of Goleta Valley v. Board of Supervisors*, (1990) 52 Cal.3d 553; *Laurel Heights Improvement Association v. Regents of the University of California*, (1988) 47 Cal.3d 376; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th

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1359; and *Laurel Heights Improvement Association v. Regents of the University of California* (1993) 6 Cal.4th 1112.

15127. LIMITATIONS ON DISCUSSION OF ENVIRONMENTAL IMPACT

The information required by Section 15126.2(c) concerning irreversible changes, need be included only in EIRs prepared in connection with any of the following activities:

(a) The adoption, amendment, or enactment of a plan, policy, or ordinance of a public agency;

(b) The adoption by a Local Agency Formation Commission of a resolution making determinations; or

(c) A project which will be subject to the requirement for preparing an environmental impact statement pursuant to the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. 4321–4347.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21100.1, Public Resources Code.

15128. EFFECTS NOT FOUND TO BE SIGNIFICANT

An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an Initial Study.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21100, Public Resources Code.

15129. ORGANIZATIONS AND PERSONS CONSULTED

The EIR shall identify all federal, state, or local agencies, other organizations, and private individuals consulted in preparing the draft EIR, and the persons, firm, or agency preparing the draft EIR, by contract or other authorization.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Sections 21104 and 21153, Public Resources Code.

15130. DISCUSSION OF CUMULATIVE IMPACTS

(a) An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 ~~(c)~~(a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

(1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the

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California Paves Way for Genesis Solar Energy Project in Riverside County

Thursday, November 12, 2009 at 10:45:07 AM - by Jeanne Roberts

It's only the first step in a long and arduous process, but the Californian Energy Commission's has okayed the application for certification for the Genesis Solar Energy Project based on facility data.

The project, under the auspices of Tucson, Arizona-based, privately held Genesis Solar LLC, will consist of two independent solar electric generating facilities with a combined total output of 250 megawatts, sited on 1,800 acres of BLM- (Bureau of Land Management -) managed land.

Genesis Solar is a wholly owned subsidiary of Juno Beach, Florida-based NextEra Energy Resources LLC, itself a consortium of FPL Group, Inc. (including the FPL's capital investment arm) and Florida Power & Light, who jointly provide energy services and project management.

The Genesis Project, once it has met California Energy Commission approval, must also seek federal approval before the construction process can begin. The original AFC (application for certification) was submitted on Aug. 31.

The concentrating solar thermal project comprises two groups of parabolic mirrors which concentrate solar energy and use it to create steam to power generators. The project will use wet cooling techniques, but only from non-potable water wells located on the project site 25 miles from Blythe adjacent to Interstate 10, and the residual water from the cooling tower will be fed into lined, on-site evaporation ponds.

This is reportedly an undeveloped area of the Sonoran Desert, with the McCoy Mountains to the East, the Palen Mountain/McCoy Wilderness area to the north, and Ford Dry Lake to the south, on the other side of I-10. The proposed site sits within 40 miles of Joshua Tree National Park, and has been used for grazing and off-road vehicle sports but has since been closed.

Reports say the Genesis Project will use 536 million gallons of water per year, and with southern California utility Pacific Gas & Electric (PG&E) committed to buying the entire output it seems like a profitable venture from both a solar electricity production and revenue model. The water issue may, however, impact final approvals.
Solar thermal trough developers use wet cooling because dry- (or air-) cooling reduces electricity output by up to five percent, and with budgets structured to wring every penny out of capital outlays, five percent is significant loss. Dry-cooling technology is also more expensive, adding to up-front costs that are not always recaptured via electricity sales.

Energy Commission Facility Certification Process

The California Energy Commission is the lead agency (for licensing thermal power plants 50 megawatts and larger) under the California Environmental Quality Act (CEQA) and has a certified regulatory program under CEQA. Under its certified program, the Energy Commission is exempt from having to prepare an environmental impact report. Its certified program, however, does require environmental analysis of the project, including an analysis of alternatives and mitigation measures to minimize any significant adverse effect the project may have on the environment.

Exhibit 708
250MW Press Reports

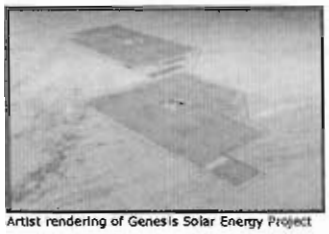
California

Genesis Solar Energy Project (CACA 48880)

Fast Facts

- The Genesis Solar Energy Project (GSEP), proposed by NextEra Energy Resources, would be located north of I-10, near Ford Dry Lake, 25 miles west of Blythe, in Riverside County.
- The proposed project is a parabolic trough solar thermal power generating facility designed to produce 250 megawatts of power.
- The project's total footprint is 4,640 acres, with project operations occurring on 1,800-acres of BLM-managed public land.
- The GSEP will consist of two independent concentrated solar electric generating facilities.
- The proposed project will deliver power via a generator that will tie-in to the Blythe Energy 500-kilovolt line; with interconnect to the Colorado River Substation.
- The project is expected to take 39 months to complete and will average 646 workers including laborers, craftsmen, supervisory support, and management personnel.
- The Genesis Solar Energy Project is expected to employ 40-50 full-time employees once the project is fully operational.

Genesis CACA-48880
- Status of Federal Process
- State of California Process
- Executive Summary and Maps
- Environmental Document
- Policy, Guidance, and Documents
- Fast Track Projects



Artist rendering of Genesis Solar Energy Project

For information about this project contact:

Bureau of Land Management
Palm Springs South Coast Field Office
1201 Bird Center Drive
Palm Springs, California 92262
Phone: (760) 833-7100
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Office Hours: 8:00 a.m. - 4:30 p.m., M-F
Contact us by Email

Last updated: 05-26-2010

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California,Äôs Genesis Solar Energy Project Looking Up

Written on November 13, 2009 by Ivan Cooper in Solar Panels

It,Äôs just the first step in a long and difficult process; however the Californian Energy Commission has approved the certification application, based on facility data, for the Genesis Solar Energy Project.

The project will include of two independent photovoltaic electric generating facilities which will have a combined total output of 250 megawatts. Under the auspices of Tucson based private company, Genesis Solar LLC, the project will be situated on 1,800 acres Bureau of Land Management land.

Genesis Solar is a wholly owned subsidiary NextEra Energy Resources LLC of Juno Beach, Florida, which is itself a consortium of Florida Power & Light and FPL Group, Inc. These two companies already provide energy services and project management on a joint basis.

News Room

October 26, 2009

NextEra Energy Resources to supply solar power to PG&E

JUNO BEACH, Fla. – NextEra Energy Resources, LLC, already the country's leading generator of wind and sol announced today that it has entered into a contract to sell 250-megawatts of solar thermal power from the p Solar Energy Project to Pacific Gas and Electric Company (PG&E).

The proposed Genesis Solar Energy Project will be comprised of two 125-megawatt units. Once both units ar the project is expected to produce approximately 560 gigawatt-hours of renewable electricity each year. This annual usage of more than 80,000 homes.

"This agreement is an important step forward in the development of solar power in California," said Mitch Da and CEO of NextEra Energy Resources. "With increasing concerns about greenhouse gases, solar electricity c meaningful impact in reducing carbon dioxide emissions. In addition to clean energy, this project will create j positive economic impacts for Riverside County."

"Solar energy is a reliable and environmentally-friendly way to help meet California's peak energy demands," senior vice president for energy procurement at PG&E. "Through our agreement with NextEra Energy, we will increase the amount of clean, renewable energy we provide to our customers in the years to come."

This is NextEra Energy Resources first contract to sell solar power to PG&E, and it is subject to approval by t Utilities Commission. In August, NextEra Energy Resources filed an Application for Certification with the Calif Commission (CEC) to construct, own and operate this 250-megawatt solar plant in the Sonoran Desert. In ad Energy Resources has filed for a right-of-way grant with the Bureau of Land Management (BLM) for this proj

For the Genesis Project, NextEra Energy Resources plans to utilize proven and scalable parabolic trough solar technology that has been used commercially for more than two decades. NextEra Energy Resources has near experience operating similar technology at its SEGS solar facilities in the Mojave Desert.

The proposed Genesis Solar Energy Project will be located on an approximately 1,800-acre site between Des Blythe, on land managed by the BLM in Riverside County, California. The more than 500,000 parabolic mirro assembled in rows to receive and concentrate the solar energy to produce steam for powering a steam turbir Genesis is one of about a dozen solar projects identified by BLM for fast track consideration to receive permit 2010.

Assuming timely regulatory approvals, NextEra Energy Resources plans to start construction on the project l operations expected to begin approximately 30 months later. Once complete, this project will reduce the emi approximately 500,000 tons per year, when compared to a high-efficiency natural gas plant. The U.S. Enviro Agency estimates this is the equivalent of removing about 83,000 passenger vehicles from the road each yea

The recently filed Application for Certification with the CEC is the latest example of NextEra Energy Resource leadership and commitment to renewable energy generation. This is the second Application for Certification t filed with the CEC. In March 2008, NextEra Energy Resources filed an Application for Certification with the CE megawatt Beacon Solar Project to be located in eastern Kern County. The company is waiting for a final dete CEC on its pending application.
In addition to being the largest operator of solar power in the United States with 310 megawatts, NextEra En through its subsidiaries, is also the largest owner and operator of wind power in the country with more than currently in operation. NextEra Energy subsidiaries also currently own and operate nearly 700 megawatts of

NextEra Energy Resources
NextEra Energy Resources is a clean energy leader and one of the largest competitive energy suppliers in Nort subsidiary of Juno Beach, Fla.-based FPL Group (NYSE: FPL), NextEra Energy Resources is the largest genera America of renewable energy from the wind and sun. It operates clean, emissions-free nuclear power generatior Hampshire, Iowa and Wisconsin as part of the FPL Group nuclear fleet, which is the third largest in the U.S. FPL revenues of more than $16 billion, approximately 39,000 megawatts of generating capacity, and more than 15,0 states and Canada. For more information, visit these Web sites: www.NextEraEnergyResources.com, www.f

Cautionary Statements And Risk Factors That May Affect Future Results

This press release contains forward-looking statements within the meaning of the Private Securities Litigatior 1995. Forward-looking statements typically express or involve discussion as to expectations, beliefs, plans, (assumptions or future events or performance and often can be identified by the use of words such as "will," " "anticipate," "estimate," and similar terms.

Although FPL Group, Inc. (FPL Group) believes that its expectations are reasonable, because forward-looking subject to certain risks and uncertainties, it can give no assurance that the forward-looking statements conta release will prove to be correct, including FPL Group's expectations with respect to the Genesis Solar Energy Important factors could cause FPL Group's actual results to differ materially from those projected in the forw: statements in this press release. Factors that could have a significant impact on FPL Group's operations and and could cause FPL Group's actual results or outcomes, both generally and specifically with respect to the G Energy Project, to differ materially from those discussed in the forward-looking statements include, among o

- Inability to complete construction of, or capital improvements to, the Genesis Solar Energy Project or other generation facilities
- Inability to obtain the required regulatory approvals and permits for the construction and operation of the (Energy Project, including obtaining CEC Certification and Bureau of Land Management permits
- Inability to obtain the supplies necessary for the construction, operation, and maintenance of the Genesis S Project or other FPL Group power generation facilities
- Changes in laws, regulations, governmental policies and regulatory actions regarding the energy industry a matters
- Inability of FPL Group to access capital markets or maintain its credit rating
- Inability to hire and retain skilled labor for the construction and operation of the Genesis Solar Energy Proje changes or disruptions related to FPL Group's workforce
- Inability to sell the energy generated by the Genesis Solar Energy Project
- Transmission constraints or other factors limiting the Genesis Solar Energy Project's or FPL Group's ability t
- General economic conditions
- Hazards customary to the operation and maintenance of power generation facilities, including unanticipatec
- Unusual or adverse weather conditions, including natural disasters
- Volatility in the price of energy
- Failure of FPL Group customers to perform under contracts
- Increased competition in the power industry
- Changes in the wholesale power markets
- Costs and other effects of legal and administrative proceedings
- Terrorism or other catastrophic events

These foregoing factors should be considered in connection with information regarding risks and uncertainties FPL Group's future results included in FPL Group's filings with the Securities and Exchange Commission at ww

FPL Group undertakes no obligation to update or review any forward-looking statement to reflect events or ci including unanticipated events, after the date on which such statement is made. New factors emerge from ti is not possible for management to predict all of such factors, nor can it assess the impact of each such factor or the extent to which any factor, or combination of facts, may cause actual results to differ materially from t any forward-looking statement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

JUL 12 2010

John Kalish
Field Manager
Palm Springs South Coast Field Office
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, California 92262

Subject: Draft Environmental Impact Statement for the NextEra Energy Resources Genesis Solar Energy Project, Riverside County, California (CEQ #20100115)

Dear Mr. Kalish:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the NextEra Energy Resources Genesis Solar Energy Project (Project). Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act (CAA).

EPA supports increasing the development of renewable energy resources in an expeditious and well planned manner. Using renewable energy resources such as solar power can help the nation meet its energy requirements while reducing greenhouse gas emissions. While renewable energy facilities offer many environmental benefits, appropriate siting and design of such facilities is of paramount importance if the nation is to make optimum use of its renewable energy resources without unnecessarily depleting or degrading its water resources, wildlife habitats, recreational opportunities, and scenic vistas.

The Bureau of Land Management (BLM) has identified thirty-four proposed renewable energy projects as "fast track" projects that are expected to complete the environmental review process and be ready to break ground by December 2010 in order to be eligible for funding under the American Recovery and Reinvestment Act (Section 1603). Twenty-eight of these projects are located in our Region, of which fourteen are located in California. We are aware that many more projects that have not been designated "fast-track" are also being considered by BLM. Many, if not all, of these projects, fast track or otherwise, are proposed for previously undeveloped sites on public lands.

In making its decisions regarding whether or not to grant rights-of-way for such projects, we recommend that BLM consider a full range of reasonable alternatives to minimize the adverse environmental impacts. Such alternatives could include alternative technologies or altered project footprints at the proposed locations, as well as alternate sites, such as inactive landfill or other disturbed sites that may offer advantages in terms of availability of infrastructure and less vulnerable habitats. Given the large number of renewable energy project applications currently under consideration, particularly in the Desert Southwest, we continue to encourage BLM to apply its land management authorities in a manner that will promote a long-term

sustainable balance between available energy supplies, energy demand, and protection of ecosystems and human health.

On November 30, 2009, EPA provided extensive formal scoping comments for the Project which included a variety of detailed recommendations regarding purpose and need, range of alternatives, water resources, and other resource areas of concern. Based on our review of the DEIS, we have rated the document as *Environmental Objections – Insufficient Information* (EO-2). Please see the enclosed "Summary of EPA Rating Definitions."

The primary basis for EPA's rating is that the technology for the Project includes wet cooling, and the extraction of over 500 million gallons of groundwater annually to support it, while similar proposed projects within the vicinity propose less-impactful, available Dry Cooling technology (e.g. the Blythe and Palen Solar Power Projects). EPA continues to recommend technologies maximizing water conservation in desert environments as a key criterion for renewable energy projects. EPA supports the Dry Cooling Alternative evaluated in the DEIS, which would substantially reduce groundwater extraction, as well as impacts to air quality and species. In addition, we strongly encourage BLM to consider a reduced-footprint alternative, including the Reduce Acreage Alternative or, at a minimum, an alternative that protects the 23 acres of critical desert tortoise habitat as well as the 65 acres of sand dune and sand drift over playa habitats. EPA believes that there are cases where effective mitigation for impacts on rare or unusual habitat can only be obtained by avoiding impacts. Fewer adverse impacts would significantly reduce required mitigation security payments and adverse cumulative impacts.

In the enclosed detailed comments, we also provide specific recommendations regarding analyses and documentation needed to assess potential significant impacts from the proposed Project. Specifically, EPA is concerned with the: 1) mitigation for groundwater and ephemeral wash impacts, 2) mitigation for impacts to biological resources and special status species, 3) analysis of cumulative impacts to air quality, 4) current justification for the Project purpose, need and range of alternatives, 5) project siting, and 6) impacts to cultural resources.

EPA appreciates the opportunity to provide input on this Project and the multitude of DEISs under preparation for renewable energy projects in our Region. We are available to further discuss all recommendations provided. When the FEIS is released for public review, please send two hard copies and two CDs to the address above (Mail Code: CED-2). If you have any questions, please contact me at (415) 972-3843 or contact Tom Plenys, the lead reviewer for this Project. Tom can be reached at (415) 972-3238 or plenys.thomas@epa.gov.

Sincerely,

FOR Cornell Dennis

Enrique Manzanilla, Director
Communities and Ecosystems Division

Enclosures: Summary of EPA Rating Definitions
EPA's Detailed Comments

cc: Jim Abbott, Bureau of Land Management, California State Office
Michael Picker, California Governor's Office
Allison Schaffer, Bureau of Land Management, Project Manager
Shannon Pankratz, US Army Corps of Engineers
Tannika Engelhard, United States Fish and Wildlife Service
Becky Jones, California Department of Fish and Game
Mike Monasmith, California Energy Commission

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE NEXTERA ENERGY RESOURCES GENESIS SOLAR ENERGY PROJECT, RIVERSIDE COUNTY, CALIFORNIA, JULY 8, 2010

Project Description

NextEra, LLC (NextEra) has requested a right-of-way (ROW) authorization to develop an 1,890-acre, 250-megawatt (MW) solar generation facility including a substation, administration, operations and maintenance facilities, evaporation ponds, surface storm water control facilities, and temporary construction areas (Project). The Project area is located approximately 25 miles west of the city of Blythe, California and north of Ford Dry Lake and Interstate 10 on lands managed by the Bureau of Land Management (BLM). The Project area is located in an undeveloped area of the Sonoran Desert that has been used for grazing and off-highway vehicle (OHV) use in the past.

NextEra proposes to construct two, independent, concentrated solar electric generating facilities with a combined electrical output of 250 MW. Electrical power would be produced using steam turbine generators fed from solar steam generators. The solar steam generators would receive heated transfer fluid from arrays of parabolic solar troughs. The Project would use a wet cooling tower for power plant cooling. Water for cooling tower makeup, process water makeup, and other industrial uses such as mirror washing would be supplied from on-site groundwater wells. Project cooling wastewater would be piped to lined, on-site evaporation ponds. The Project would tie into a 230 kilovolt (kV) on-site switchyard and 500 kV transmission line with an interconnection to the Colorado River Substation.

Water Resources

Dry Cooling

To maximize environmental acceptability, EPA continues to recommend technologies which conserve water as a key criterion for renewable energy projects currently under review by our agency. The proposed use of wet cooling would result in groundwater extraction in the Sonoran Desert of over 500 million gallons of water annually (1,644 acre-feet per year). The Project does not propose the use of reclaimed water nor the recycling of water.

The proposed Project's use of wet cooling is inconsistent with the recommendations of the "Best Management Practices and Guidance Manual: Desert Renewable Energy Projects," which was jointly developed by the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), the California Energy Commission, and others[1]. That manual states, "[t]he following critical actions provide guidance on how to address the major significant issues that usually arise when conducting environmental reviews… 2) The project will not use fresh groundwater or surface water for power plant cooling."

[1] Renewable Energy Action Team (California Energy Commission, California Department of Fish and Game, U.S. Department of Interior Bureau of Land Management and Fish and Wildlife Service). CEC-700-2009-016SD-REV

Under the Dry Cooling Alternative, water use would be reduced by over 90% to 132 acre-feet per year (at pg. C.2-157). Additionally, dry cooling provides environmental benefits beyond water conservation. Dry cooling reduces emissions of particulate matter, both 10 micron (PM_{10}) and 2.5 micron ($PM_{2.5}$), due to the elimination of cooling towers. The Dry Cooling Alternative reduces annual PM_{10} emissions by 19% (3.8 tons) and $PM_{2.5}$ emissions by 53% (3.8 tons) (at pg. C.1-19 and C.1-33). Additionally, the six, eight-acre evaporation ponds that would collect blowdown water from the cooling towers pose several threats to wildlife. The ponds are a danger to the birds attracted by the water due to the toxic concentration of salt and possibly other constituents within the groundwater (at pg. C.2-95). The ponds could also attract ravens which could increase predation rates on juvenile desert tortoise in adjacent habitats. A combination of dry cooling with zero liquid discharge (ZLD) would eliminate impacts from wildlife exposure to the evaporation ponds and is recommended by staff, California Department of Fish and Game and the US Fish and Wildlife Service (USFWS) (at pg. C.2-95).

We also point out the limited use of wet cooling in similar large scale solar energy projects. Of the 21 solar energy projects within Region 9 that have appeared in the Federal Register recently (as a notice of intent to prepare an Environmental Impact Statement), only four projects continue to propose wet cooling. Of those projects, three are sponsored by a subsidiary of the same corporate entity, FPL Energy. NextEra concludes that the use of dry cooling will decrease the project output, which will render the Project economically unsound or noncompetitive (at pg. B.2-18). However, as the DEIS indicates, the Final Staff Assessment for the Beacon Solar Energy Project found that dry cooling was economically feasible because it surpassed the benchmark internal rate of return established for economic feasibility. Further, three solar thermal projects (Blythe, Palen and Desert Sunlight Solar Projects) propose the use of dry cooling in the same general area with a similar climate as the proposed Project, and have similar if not identical efficiency losses from using dry cooling (at pg. B.2-18).

Lastly, during our recent meeting with BLM's California and Nevada State Directors on June 30, 2010, Ron Wenker indicated he had sent a letter to renewable energy applicants in Nevada to eliminate wet cooling as an option for projects in the Amargosa Valley. EPA supports this guidance and request that it apply to all applications on BLM's lands throughout the Desert Southwest.

> *Recommendations:*
> EPA strongly recommends that BLM not approve the use of wet cooling. The Dry Cooling Alternative would reduce water use from 1,644 acre-feet per year to 132 acre-feet per year, and reduce the projects impacts on air quality and birds.

Groundwater

BLM has proposed monitoring future changes to groundwater levels and water quality caused by the proposed Project and other pumping in the Basin (Soil & Water – 4 and 20). Measures are also proposed to mitigate potential future impacts to neighboring well owners (Soil & Water – 5) and potential impacts to the Colorado River from pumping (Soil & Water –15). While the Soil

and Water Resources section references these monitoring and mitigation measures, the DEIS does not include a discussion of the effectiveness of the monitoring and the impacts of the mitigation. The FEIS should further describe groundwater mitigation and detail its effectiveness in minimizing groundwater withdrawal.

The DEIS also acknowledges that, due to the high volume of projects in the region, cumulative impacts to groundwater may place the Chuckawalla Valley Groundwater Basin in overdraft condition. Overdraft is described as the amount of water withdrawn exceeding the amount of water that recharges the basin (at pg. C.9-71). Cumulative impacts from reasonably foreseeable projects as well as other unidentified renewable energy projects in the I-10 corridor are dismissed due to the total recoverable groundwater in storage (estimated to be as much as 15,000,000 acre feet) (at pg. C.9-72). The Soil and Water section does not provide a reference for this groundwater storage figure and does not discuss other estimates for the storage amount which may be lower (at pg. C.9-72).

Despite the amount of water in basin storage which exceeds the potential cumulative overdraft during the 30 year Project life, the DEIS indicates that even modest drawdowns of 0.3 feet can adversely affect vegetation if groundwater drops below the effective rooting levels sustained over time so that plants are unable to recover (at pg. C.2-4 and C.2-98). Modeling results presented in the DEIS suggest that during the life of all the reasonably foreseeable projects, groundwater level declines of five feet or more would be located at a distance of approximately 4 miles from the Project site and up to one foot or more up to 8 miles from the proposed production wells. A drop in groundwater levels could also potentially impact neighboring wells, lower the water table, and impact groundwater dependent vegetation and microfill woodlands (at pg. C.2-20).

The DEIS also indicates that operations for all reasonably foreseeable projects could result in indirect impacts to the Palo Verde Mesa Groundwater Basin by inducing underflow from the Colorado River to the Palo Verde Mesa Groundwater Basin. Such basin balance analyses for the cumulative effects to the Palo Verde Mesa Basin are not provided in the DEIS.

Recommendations:

Impacts to groundwater in the Chuckawalla Valley Groundwater Basin and the Palo Verde Mesa Groundwater Basin should be minimized as much as possible. In addition to adopting the Dry Cooling Alternative, this may involve altering project design, implementing recycled water techniques, as well as considering reduced acreage alternatives. The FEIS should describe the effectiveness of, and commitments to, the mitigation and monitoring plans described in the Mitigation Measures Section C.9 Soil & Water - 3, 4, 5, 15, 18 and 20.

The FEIS should also further describe the estimation of the impacts from withdrawing groundwater that is recharged by the Colorado River (at pg. C.9-2) and the effectiveness of the mitigation proposed. The expected effectiveness of the mitigation must be documented and committed to, and the FEIS should clarify whether or not an entitlement

to water from the Colorado River aquifer would be needed. This information should be made available in the FEIS and the ROD.

The FEIS should discuss and estimate the additional impact from other renewable energy projects in the I-10 corridor that may result from its selection as an area for further renewable energy development (at pg. C.9-116).

The FEIS should include a basin balance analysis for the Palo Verde Mesa Groundwater Basin.

The FEIS should address what measures would be taken, and by whom, should groundwater resources in the basins become overextended to the point that further curtailment is necessary due to, for example, additional growth, the influx of large-scale solar projects, drought, and the utilization of existing or pending water rights in the basin.

The FEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, likely location, and the biological and environmental resources at risk.

Reclaimed Water

The DEIS considered the use of reclaimed water (treated wastewater), but eliminated the option from detailed evaluation. EPA seeks further clarification and discussion of this, particularly in light of the viability of reclaimed water uses described in the Alternatives Evaluated section (at pg. B.2-57). These sources should also be discussed in light of the smaller amount of water necessary for the Dry Cooling Alternative. A subsidiary of FPL Energy has sponsored the Beacon Solar Energy Project on BLM land in California. The California Energy Commission's Final Staff Assessment[2] evaluates dry cooling and two water sources for wet cooling considered feasible. The water sources are treated wastewater from 15 and 40 miles away. Both treated wastewater sources have similar costs. In one alternative the solar energy facility will pay the cost of a 40 mile pipeline, in the other, the facility will pay the cost of a 15 mile pipeline and the cost to connect residents to the treatment plant (to generate a sufficient quantity of wastewater).

Recommendation:
The FEIS should evaluate potential sources of reclaimed water from all wastewater treatment plants in at least a 40-mile radius.

[2] Final Staff Assessment, Beacon Solar Energy Project, Application for Certification (08-AFC-2) Kern County, California Energy Commission (http://www.energy.ca.gov/2009publications/CEC-700-2009-005/CEC-700-2009-005-FSA.PDF)

Floodplains, Drainages and Ephemeral Washes

The Project would directly impact 91 acres of state jurisdictional waters including 16 acres of micro phyllous riparian vegetation, eliminating the functions of this network of ephemeral drainages (at pg. C.2-2).

Natural washes perform a diversity of hydrologic, biochemical and geochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems: adequate capacity for flood control, energy dissipation, and sediment movement, as well as impacts to valuable habitat for desert species.

The DEIS states that off-site storm water flows impacting the Project site are from a large watershed area to the north of the site which covers approximately 91,627 acres. The upstream extents of the contributing watershed extend into the Palen Mountains (at pg. C.9-32). The proposed Project is located on an alluvial fan where flash flooding and mass erosion could impact the Project (at pg. C.9-115). As a result, natural drainage across the site is episodic, shallow, and occurs over a broad area primarily as sheet flow or in shallow washes (at pg. B.1-16). All existing washes and floodplains within the Project boundary will be completely eliminated by the grading of approximately 1,800 acres to provide the flat, uniform and vegetation-free topography required for the construction and operation of the solar mirror array (at pg. C.9-56).

The applicant proposes to divert flows downstream of the site utilizing existing drainage paths. Three engineered channels and associated diversion berms across the Project site with energy dissipaters at the end would restore sheet flow down slope of the Project (at pg. B.1-16 and pg. C.9-55). Onsite flows would be discharged directly into detention basins via a series of smaller internal swales and channels (at pg. C.9-55). According to staff analysis in the DEIS, the applicant's drainage plans do not provide sufficient information to establish the post-Project flooding conditions or to determine the potential impacts to vegetation downstream (at pg. C.2-66).

> *Recommendations:*
> Demonstrate that downstream flows will not be disrupted due to proposed changes to natural washes, the excavation of large amounts of sediment or as a result of major storm events.
>
> Discuss the feasibility of utilizing existing natural drainage channels on site. Discuss the feasibility of utilizing more natural features, such as earthen berms or channels, rather than concrete-lined channels, if proposed.

Include the finalized drainage plan for the Project in the FEIS, to facilitate assessment of impacts and effectiveness of mitigation measures.

The FEIS should clarify the flow path of exterior storm water flow, and summarize modeled impacts (hydraulics of flow, velocity, sediment transport, sediment delivery and potential stream channel changes) of diverting drainages and floodplains.

The Project proposes to minimize and offset the direct and indirect impacts to state waters via acquiring and enhancing 132 acres of ephemeral dry washes within the Chuckwalla Valley watershed. In light of the multiple applications for renewable energy projects in the near vicinity, availability of such compensation lands should be discussed, including a comparison of the quality and functions of the desert washes to those lost on the Project site.

Recommendation:
Discuss the availability of sufficient compensation lands to replace desert wash functions lost on the Project site.

As the DEIS indicates, the Concept Drainage Study and the Draft Channel Maintenance Plan do not appear to adequately address the issue of the collection of offsite flows or the mitigation of erosion to offsite areas caused by the presence and operation of the proposed collector and conveyance channels. We also have concerns that reliance on substantial maintenance will reduce effectiveness of the mitigation, and question whether the main goals of the channel maintenance program will be met. If such substantial maintenance is needed, the implementation mechanism, accountability, enforcement, and funding of such a program should be identified. In general, the viability of this mitigation is not discussed and the mitigation specifics are deferred to a later approval process. Additionally, the DEIS does not clarify discharge locations for any sediment or detention basins.

Recommendations:
The FEIS should fully describe how offsite flows will be collected and how erosion to offsite areas will be mitigated. Describe the specifics of the needed maintenance program necessary to prevent significant erosion and offsite damage and flooding, including the implementation mechanism, responsible parties, enforcement, and funding sources.

The FEIS should describe the Best Management Practices to be used to ensure that discharges from the project site match pre-development conditions. The FEIS should also define the term "peak discharges," explain procedures for non-peak discharges, describe the downstream impacts of flow changes, and identify discharge points and flow controls for the sediment/retention basins' water.

The FEIS should clarify discharge locations for any detention or sediment basins and describe the impacts of excess water provided to some drainages and reduced or no discharges to other drainages.

The DEIS indicates that the proposed Project does not comply with the State of California's water policies including the proposed method of wastewater discharge which is inconsistent with the Energy Commission's policy that encourages the use of Zero Liquid Discharge (ZLD) systems that are designed to eliminate wastewater discharge and inherently conserve water (at pg. C.9-88). While mitigation measure Soil and Water – 18 is intended to address inconsistencies with state water policies, the measure as presented in the DEIS does not contain any specifics.

> *Recommendations:*
> The FEIS should fully describe compliance with state water policies and incorporate specific measures as part of measure Soil and Water – 18.
>
> The FEIS should discuss how the Dry Cooling Alternative combined with Zero Liquid Discharge (ZLD) systems may assist the Project in achieving consistency with California's water policies.

Fencing

The FEIS should provide more detailed information about fencing and its potential effects. The DEIS does not provide detailed information about fencing nor the effects of fencing on drainage systems. In this region, storms can be sudden and severe, resulting in flash flooding. Fence design must address hydrologic criteria, as well as security performance criteria. The National Park Service recently published an article[3] on the effects of the international boundary pedestrian fence on drainage systems and infrastructure. We recommend that BLM review this article to ensure that such issues are adequately addressed.

> *Recommendation:*
> Provide more detailed information about fencing and its potential effects on drainage systems within the FEIS. Ensure that the fencing proposed for this project will meet appropriate hydrologic, wildlife protection and movement, and security performance standards.

Jurisdictional Determination

At the time of publication of this DEIS, the U.S. Army Corps of Engineers had not yet made a jurisdictional determination for this Project. We understand this has been completed and the findings should be discussed in the FEIS. Measures to reduce impacts to any waters of the United States should be included in the FEIS, as well as measures to mitigate impacts that cannot be reduced or avoided.

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[3] National Park Service, August 2008, Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizona,

Biological Resources

Endangered Species and Other Species of Concern

The site supports a diversity of mammals, birds, and reptiles, including some special status wildlife species. Grading on the Project site would result in direct impacts to special status animal species and special status plant species through the removal of vegetation that provides cover, foraging, and breeding habitat for wildlife (at pg. C.2-61 to C.2-65). As the DEIS states, severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery; complete ecosystem recovery may require over 3,000 years (at pg. C.2-61). We understand that the Biological Opinion for this Project is not scheduled for completion until after the Final EIS is published. The Biological Opinion will play an important role in informing the decision on which alternative to approve and what commitments, terms, and conditions must accompany that approval.

Approximately 1,786 acres of desert tortoise habitat (including 23 acres of critical habitat) would be permanently impacted by the proposed Project. Long-term impacts may occur as a result of permanent loss of habitat, increased predation, and habitat fragmentation. Additionally, 66 acres of Mojave fringe-toed lizard (MFTL) habitat would be permanently lost in addition to 453 acres of indirect impacts to sand dunes that would result from disruption to the sand transport corridor on site (at pg. C.2-62). The MFTL is restricted to Aeolian (wind-blown) sand habitats. The Project site contains stabilized and partially stabilized sand dune habitat (28 acres) and playa/sand drift over playa habitat (37 acres) (at pg. C.2-35).

EPA appreciates the extensive discussion on the impacts to MFTL and desert tortoise as well as the proposed mitigation measures and compensatory mitigation. The Reduced Acreage Alternative would roughly reduce impacts to desert tortoise habitat by 50% and have substantially less impact on the MFTL. While EPA supports consideration of this alternative, we also suggest evaluation of a "Resource Avoidance" alternative in the FEIS which modifies the proposed 1,800 acre Project footprint by protecting, at a minimum, the 23 acres of critical desert tortoise habitat as well as the 65 acres of sand dune habitat and sand drift over playa habitats. This alternative may provide an opportunity to balance species protection with power production and allow sufficient acreage to offset any potential efficiency losses due to dry cooling. EPA believes that there are cases where effective mitigation for impacts on rare or unusual habitat can only be obtained by avoiding impacts. Rarely, if ever, is restoration or compensation an adequate mitigation for the loss of these habitats. In such cases, mitigation occurs by siting projects away from habitats of concern[4].

EPA continues to recommend that proposed designs for renewable energy projects should avoid and minimize impacts to all federally threatened and endangered species, as well as BLM species of concern and State species of concern. In addition to desert tortoise and MFTL, the site of the proposed Project includes potential breeding and foraging habitat for sensitive species such as the American badger, desert kit fox, Western burrowing owl, golden eagle, among others. Any

[4] *Habitat Evaluation: Guidance for the Review of Environmental Impact Assessment Documents* (January, 1993), p. 88. Available: http://www.epa.gov/compliance/resources/policies/nepa/habitat-evaluation-pg.pdf

mitigation measures that result from consultation with the USFWS to protect sensitive biological resources should be included in the FEIS and, ultimately, the ROD. The FEIS should also clearly articulate under which alternatives sensitive biological resources, including the desert tortoise, MFTL and Western burrowing owl, would be least impacted and to what extent impacts can be mitigated.

Recommendations:
We urge BLM to coordinate with USFWS on the timing of FEIS and the Biological Opinion. The FEIS should provide an update on the consultation process, and we strongly recommend including the Biological Opinion as an appendix.

Mitigation measures that result from consultation with the US Fish and Wildlife Service to protect sensitive biological resources, including desert tortoise and MFTL should be included in the FEIS and, ultimately, the ROD.

We recommend consideration of the Reduced Acreage Alternative that would reduce impacts to desert tortoise by 50% and have substantially fewer impacts to the MFTL. The FEIS should also evaluate a "Resource Avoidance" alternative in the FEIS which modifies the proposed 1,800 acre Project footprint by protecting, at a minimum, the 23 acres of critical desert tortoise habitat as well as the 65 acres of sand dune habitat and sand drift over playa habitats. Present environmental impacts from all alternatives considered in comparative form, sharply defining the issues and providing a clear basis for choice among options for the decision maker and the public (40 CFR 1502.14).

Mitigation Commitments and Funding

The Biological Resources Table 6 (at pg. C.2-65) summarizes the recommended mitigation acreage for the proposed Project, including 1,878 acres for direct impacts to desert tortoise, 424 acres for direct and indirect impacts to the Mojave fringe-toed lizard and 132 acres for direct impacts to State waters. The Applicant proposes to achieve a 3:1 compensation ratio for direct impacts to microphyllous riparian vegetation and a 1:1 ratio for unvegetated ephemeral swales. The costs associated with desert tortoise compensatory mitigation include an acquisition fee of $500 per acre, an initial habitat improvement cost of $330 per acre, and a long-term management endowment of $1,450 per acre (for total of $2,280 per acre security fee) (at pg. C.2-75).

Detailed mitigation measures are determined on a Project specific basis, and must be contained in each Project's environmental analyses and decision documents. Project proponents have a number of options by which they can fulfill their mitigation requirements. The California Renewable Energy Action Team (REAT) recently announced a Memorandum of Agreement (MOA) with the National Fish and Wildlife Foundation for operation of the Renewable Energy Action Team Mitigation Account (REAT Account). The REAT Account is designed to help project proponents and the State and Federal governments more effectively implement biological resources mitigation for renewable energy projects in the Mojave and Colorado Desert region of southern California. It also will aid project proponents in carrying out contracting and construction activities in a timely manner per requirements for American Recovery and

Reinvestment Act (ARRA) funding eligibility. Use of the REAT Account is only one of several options available to the proponent, and participation is voluntary.

Recommendations:
The FEISs should describe the final biological resources mitigation commitments and how they would be funded and implemented. They should state whether and how the Project Applicant would utilize the REAT account or other mechanism.

Include, in the FEIS, mitigation plans for unavoidable impacts to waters of the State and biological resources such as desert tortoise, desert kit fox, burrowing owls, Mojave fringe toed lizard, golden eagles, and their habitats. Such mitigation plans are described briefly in the sections BIO-1 to 27 in the DEIS; further details should be provided in the FEIS. Specifically, if the applicant is to acquire compensation lands, the location(s) and management plans for these lands should be fully disclosed.

Analyze the environmental and economic trade-offs of acquiring the off-site lands versus reducing the size of on-site alternatives for equivalent protection.

All mitigation commitments should be included in the Record of Decision (ROD).

Air Quality

Mitigations

EPA commends BLM for incorporating fugitive dust control measures to limit PM_{10} impacts, and mitigation measures to address exhaust emissions (at pg. C.1-22). We also were pleased at the inclusion of mitigation measure AQ-SC2 which would require the development of an Air Quality Construction Mitigation Plan (AQCMP) as well as engine requirements for diesel equipment specified by mitigation measure AQ-SC5.

In light of the number of renewable energy projects to be constructed in the area as well as staff's conclusion that fugitive dust emissions and the results of the air dispersion modeling were underestimated (at pg. C.1-17), EPA supports incorporating mitigation strategies to reduce or minimize fugitive dust emissions as well as more stringent emission controls for PM and ozone precursors for construction-related activity. However, we also support minimizing disturbance to the natural landscape as much as possible, so that measures to reduce fugitive dust are not required to mitigate land disturbance from the Project. All applicable state and local requirements and the additional and/or revised measures listed below should be included in the FEIS in order to reduce impacts associated with PM, ozone precursors, and toxic emissions from construction-related activities:

Fugitive Dust Source Controls:

- Reduce land disturbance activities as much as possible so that natural, stable soil conditions remain.

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing, and phase grading operations, where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage, and limit speeds to 15 miles per hour (mph) or lower. Limit speed of earth-moving equipment to 10 mph, 5 mph on unpaved roads and unsealed site areas. *(Note the discrepancy between vehicular speeds on pages C.1-22 and C.1-27 in the DEIS).*

Mobile and Stationary Source Controls:

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at California Air Resources Board (CARB) and/or EPA certification, where applicable, levels and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. CARB has a number of mobile source anti-idling requirements. See their website at: http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations
- If practicable, lease new, clean equipment meeting the most stringent of applicable Federal or State Standards.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable, to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Administrative controls:

- Identify all commitments to reduce construction emissions and incorporate these reductions into the air quality analysis to reflect additional air quality improvements that would result from adopting specific air quality measures.
- Identify where implementation of mitigation measures is rejected based on economic infeasibility.
- Prepare an inventory of all equipment prior to construction, and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.) Meet CARB diesel fuel requirement for off-road and on-highway (i.e., 15 ppm), and where appropriate use alternative fuels such as natural gas and electric.
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.
- Identify sensitive receptors in the project area, such as children, elderly, and infirm, and specify the means by which you will minimize impacts to these populations. For

example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

Cumulative Analysis

The methodology used for the cumulative impacts air quality analysis appears to be quite robust; however, the results are not presented nor described. The methodology describes consideration of projects in close proximity to the proposed Project, but limits the scope of the cumulative impact analysis to only those projects occurring within 6 miles of the proposed Project site. The scope of the cumulative impact analysis is limited to focus on 'localized' cumulative impacts; however, in an area in nonattainment for multiple criteria pollutants, including PM_{10}, the cumulative impacts analysis should cast a wider net. Without further information about projects in the region, it is difficult to conduct a thorough cumulative impacts analysis. The FEIS should include a more extensive analysis that defines the parameters of the analysis and the reasons for the establishment of those parameters.

Recommendations:
Update the list of reasonably foreseeable projects used in the air quality analysis to include all projects that may have impacts that may cumulatively affect the region's ability to continue achieving air quality goals.

The FEIS should include a more extensive cumulative air impacts analysis as discussed above, and specify the parameters of the analysis and the reasons for the establishment of those parameters. If additional mitigation measures would be needed, or if the Project would affect the ability of other foreseeable projects to be permitted, the FEIS should discuss this.

Update Air Quality Standards

The Federal Standards noted in Air Quality Table 2 (at pg.C.1-8) should be updated as recommended below.

Recommendations:
Sulfur Dioxide 1 hour standard should be corrected to read 0.075 ppm. Also, the Annual and 24 hour standards were revoked.

Lead standard should be updated to reflect a 3 month rolling average of 0.15 ug/m3

Climate Change

EPA commends BLM for including a substantive discussion on greenhouse gases as well as estimates of carbon dioxide emissions from the construction of the proposed Project. Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Effects on weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates can be expected. These

changes may affect the proposed Project as well as the scope and intensity of impacts resulting from the proposed Project. The DEIS does not include measures to avoid, minimize, nor mitigate the effects of climate change on the proposed Project.

Recommendations:
Consider how climate change could affect the proposed Project, specifically within sensitive areas, and assess how the impacts of the proposed Project could be exacerbated by climate change.

Identify specific mitigation measures needed to 1) protect the Project from the effects of climate change, 2) reduce the Project's anticipated adverse air quality effects, and/or 3) promote pollution prevention or environmental stewardship.

Identify strategies to effectively monitor for climate change impacts in the surrounding area, such as monitoring groundwater change or special status species.

Quantify and disclose the anticipated climate change *benefits* of solar energy. We suggest quantifying the greenhouse gas emissions that would be produced by other types of electric generating facilities (solar, geothermal, natural gas, coal-burning, and nuclear) generating comparable amounts of electricity, and compiling and comparing these values.

Purpose, Need and Reasonable Range of Alternatives

EPA believes the discussion in the DEIS regarding the purpose and need for the Project should be expanded. As we indicated in our scoping comments, the *purpose* of the proposed action is typically the specific objectives of the activity, while the *need* for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity. The Purpose and Need for a project should be broad enough to spur identification of the full breadth of a reasonable range of alternatives, regardless of what the future findings of an alternatives analysis may be.

While we commend BLM for including a Reduced Acreage Alternative and the Dry Cooling Alternative, for NEPA purposes, the DEIS eliminates all off-site and alternative technology alternatives from consideration. Elimination of such alternatives is, in part, influenced by the BLM's narrowly defined Purpose and Need. According to the DEIS, BLM's Purpose and Need for the proposed action is to approve, approve with modifications, or deny issuance of a Right-of-Way (ROW) grant for the Project (at pg. B.2-10). EPA understands the rationale in considering the "federal" Purpose and Need for the Project; however, EPA recommends that the FEIS further characterize the "project" Purpose and Need as part of BLM's statement. BLM's purpose statement should be broad enough to allow for a reasonable range of alternatives, including off-site alternatives such as the Gabrych Alternative. The Gabrych Alternative, evaluated by the California Energy Commission under the California Environmental Quality Act (CEQA) in the DEIS, was identified by the Renewable Energy Transmission Initiative (RETI) Final Phase 2a Report as disturbed land that would support renewable energy development (at pg. B.2-23). The Gabrych Alternative is preferred over the proposed Project for six resource

elements including biological, cultural, soils and water and recreation and wilderness (at pg. B.2-52).

Recommendations:
The FEIS should reflect a broader purpose and need statement that is broad enough for analysis and consideration of a full range of reasonable alternatives for addressing the underlying need including off-site alternatives, such as the Gabrych Alternative or other environmentally preferable off-site alternatives, and other modes of renewable energy generation.

Describe BLM's options for acting upon an application for a right-of-way grant. For instance, describe the extent of BLM's authority to require the adoption of a "modified" project design or alternate site on BLM land, to deny an application, or to select another ROW application submitted by the same applicant or its corporate owner.

Include supporting documentation and additional discussion on BLM's rationale for the elimination of off-site alternatives from further consideration under NEPA.

As indicated in our scoping comments, the FEIS should discuss the proposed Project in the context of the larger energy market that this Project would serve. While the DEIS appears to indicate the need for the proposed Project has its basis in Federal orders and laws that require government agencies to evaluate energy generation projects and facilitate the development of renewable energy sources, EPA does not believe the current Purpose and Need section fully describes the specific Federal, State, and individual utility power provider renewable energy targets, timelines, and underlying needs to which BLM is responding. EPA believes this context is imperative for decision makers and the public to have, in light of the large number of renewable energy projects moving forward.

Presumably, some number of renewable energy facilities will be constructed pursuant to the joint Department of Energy (DOE)/BLM Programmatic Solar DEIS effort as well as the Desert Renewable Energy Conservation Plan (DRECP) process. It would be helpful to know the likely locations, construction timing, and generation capacities of such facilities relative to the proposed Project.

Recommendations:
Fully describe the specific Federal and State renewable energy targets, timelines, and underlying needs to which BLM is responding, and explain how the Project meets those needs in the context of the many renewable energy project applications in the Desert Southwest and California. Update the discussion regarding the *need* for the individual proposed projects, utilizing more accurate, robust, and up-to-date references.

To the extent practicable, the FEIS should discuss how many of the total renewable energy applications received by BLM are likely to proceed pursuant to the joint Department of Energy (DOE)/BLM Programmatic Solar DEIS effort and the Desert

Renewable Energy Conservation Plan (DRECP) process, and the level of energy production those applications represent.

Further describe the utility purchases of power and provide a description of how the power would be bought, sold, and used so that the reader can better evaluate the tradeoffs between resource protection and power generation.

Project Siting

EPA continues to recommend the identification of potential project site locations that have been previously disturbed or contaminated. For example, the EPA's Re-Powering America initiative works to identify disturbed and contaminated lands appropriate for renewable energy development. For more information on this initiative visit http://www.epa.gov/oswerepa/. EPA strongly encourages BLM to promote the siting of renewable energy projects on disturbed, degraded, and contaminated sites before considering siting on large tracts of undisturbed public lands. We also recommend consideration of each proposed renewable energy project in comparison with others proposed in the Desert Southwest region and their adverse effects on waters of the State, jurisdictional waters of the United States, biological resources, air quality, and visual and cultural resource impacts.

Recommendations:

Describe the criteria used to identify and compare siting locations for renewable energy facilities, and to ascertain whether or not any disturbed sites are available that would be suitable for the proposed project.

Incorporate alternatives such as the Gabrych Alternative and a "Resource Avoidance" alternative that would avoid and minimize adverse effects on biological, aquatic and cultural resources. Fewer adverse impacts would significantly reduce required mitigation security payments and adverse cumulative impacts.

The FEIS should include a table comparing the life-cycle costs of the different alternatives. Include information on the cost of the land, different project design criteria that would be required, acquisition effort, scheduling effects, and cost of mitigation.

The FEIS should demonstrate that the approved Project site is consistent with the Desert Renewable Energy Conservation Plan for the Mojave and Colorado Desert Regions. At a minimum, the FEIS should describe and commit to a process to ensure approved projects are consistent with the Desert Renewable Energy Conservation Plan.

Cultural Resources and Coordination with Tribal Governments

The Project could have direct impacts on 14 historically significant archaeological resources including 8 prehistoric to historic period Native American archaeological sites (at pg. C.3-1) According to the DEIS, BLM is presently in the process of initiating formal consultation with the ACHP, the State Historic Preservation Officer (SHPO), California Energy Commission staff,

Native American groups, and the public at large on the development of a Programmatic Agreement (PA) for the proposed Project (at pg. C.3-18). The DEIS indicates that CUL-1 would require compliance with the PA under Section 106 of National Historic Preservation Act (NHPA).

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes.

> *Recommendation:*
> The FEIS should discuss how the concerns raised by Tribes were addressed and resolved, provide an update on the status of the Programmatic Agreement and whether coordination with Tribes is occurring, and indicate whether the Tribes are in agreement that the Programmatic Agreement will reduce impacts to prehistoric and sacred sites to less than significant. We recommend that these measures be adopted in the Record of Decision (ROD).

Consultation for tribal cultural resources is required under Section 106 of NHPA. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO). Under NEPA, any impacts to tribal, cultural, or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Executive Order 13007, *Indian Sacred Sites* (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

> *Recommendation:*
> The FEIS should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how the BLM will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist.

<u>Socio-Economic Analysis</u>

The Blythe, Palen, and Genesis projects are located within approximately 40 miles of one another and the region anticipates an influx of hundreds of workers. Combined, construction of these three projects will require an average of 1,816 workers over the three to five year

construction periods. Construction workers may come from the local counties of La Paz, AZ, Riverside, CA, and San Bernardino, CA.

Recommendation:
We recommend that the FEIS for all projects contain analyses of the impacts of workers to the areas of Desert Center and Blythe, CA. The documents should provide an estimate of the amount of growth, likely location(s), the impacts on municipal services, and the biological and environmental resources at risk. The FEIS should include a discussion of potential transit options (including formal Rideshare, Carpooling, and Bussing) to transport workers from the nearest population centers to the remote project sites, as well as other measures to facilitate accessibility.

July 7, 2010

Jim_Stobaugh@blm.gov

Re: Staff Assessment and Draft Environmental Impact Statement for the Proposed Genesis Solar Energy Project

Dear Mr. Stobaugh:

This letter constitutes the comments on the Proposed Genesis Solar Energy Project and accompanying draft environmental impact statement (DEIS) of the Natural Resources Defense Council (NRDC), The Wilderness Society (TWS), and Defenders of Wildlife, national environmental membership organizations with long histories of advocacy on behalf of the lands and resources administered by the Bureau of Land Management (BLM). More recently these organizations have been intensively involved in the Bureau's work to develop a comprehensive solar program as well as its efforts to "fast track" the permitting of individual utility-scale solar projects in California so that they may be eligible for grant funding under the American Recovery and Reinvestment Act of 2009 (ARRA).

Introduction: Our organizations recognize the need to develop the nation's renewable energy resources and to do so rapidly in order to respond effectively to the challenge of climate change. Unique natural resources here in California are already being affected by climate change, including, for example, the pikas of the High Sierra Nevada and the Joshua trees in the Mojave Desert. We also recognize that renewables development can help create jobs in communities that are eager for them, because of the nation's economic crisis. For these and other related reasons, our organizations are working with regulators and project proponents to move renewables projects forward. That said, renewable development is not appropriate everywhere on the public lands and must be balanced against the equally urgent need to protect unique and sensitive resources of the California Desert Conservation Area (CDCA). California is lucky indeed that we have sufficient renewable resources, including solar resources, to do their development in an environmentally and fiscally sensitive way.[1]

[1] California's Renewable Energy Transition Initiative found, for example, that the state potentially could access 500 GW of renewable energy, an order of magnitude greater than the state's peak demand and far beyond the ability of our electric grid could handle, although not all of this potential is located in environmentally desirable places.

As we and our colleagues at sister organizations have repeatedly stated, the best way to develop the solar resources of the CDCA is through comprehensive, pro-active planning by both the federal government and the state to identify the most appropriate areas for such development -- *i.e.*, solar development zones -- and to guide development to those zones. *See, e.g.*, letter dated June 29, 2009 to Interior Secretary Salazar and California's Governor Schwarzenegger and signed by 11 organizations, including our own, attached as Exhibit 1.

We support the BLM's adoption of zone designation for its forthcoming solar programmatic EIS because of the benefits inherent in this approach, including but not limited to clustering development of large-scale projects in appropriate places, rather than permitting them to be located across the landscape in numerous locations. We also applaud the agency's – and the Interior Department's – commitment to work closely with the State of California in the development of the Desert Renewable Energy Conservation Plan which, as you may already know, will designate not only renewable energy development zones, but also zones for conservation. In addition, it will include a comprehensive mitigation strategy. The integration and completion of both of these efforts offers the promise of a balanced plan that will facilitate development of renewable resources in the desert while protecting desert resources.

Despite our fundamental belief in the critical importance of agency-guided development of renewables, rather than developer-initiated development, we have, as indicated, been investing a great deal of time and effort into the fast track projects. We have done so in response to the emphasis that Interior, the BLM and the developers place on meeting ARRA deadlines as well as the potential role these projects could play in meeting the renewable generation and economic goals of the state and federal governments. We have also done so because we wanted to make the projects, and especially the utility-scale solar projects, as environmentally sensitive as they can be and because we wanted to ensure, to the extent possible, that their accompanying environmental documents are as sound as they can be. It is now apparent to us that not even the best of the environmental documents being produced for the fast track projects and/or the best projects should be models or precedents for the future.

The fast track project sites were chosen without the benefit of siting criteria developed either by desert activists, environmental organizations, scientists and others. *See* Renewable Siting Criteria for California Desert Conservation Area, attached to June 29, 2009 letter referred to above, or by the Bureau. The Bureau in fact has yet to publish any siting guidance that would help field staff, developers and others identify appropriate sites – i.e., those with relatively low resource values and fewer resource conflicts. Moreover, the projects themselves were designated by Interior and the BLM as fast track projects without consideration of potential environmental issues. And, equally important, the timetable established for review of these projects did not take into account their scale, the agency's lack of experience with the technologies involved, and the agency's lack of experience permitting these kinds of projects.

Regardless of the outcome of the environmental review process for this or any other fast track project, we urge the BLM and the Interior Department to acknowledge publicly the deficiencies of the current process and to commit publicly to improving it. More specifically, we urge both entities to affirm that neither the current process, nor any of the project sites, nor any of the environmental documents, establish any legal or procedural precedents for future decision-making, siting or environmental review.

<u>The Genesis Solar Energy Project:</u> This proposed Project site is located on largely undisturbed desert land within the Multispecies Wildlife Habitat Management Area (WHMA) designation for

the eastern Colorado Desert region of the CDCA and, if constructed, will result in almost 2,000 acres of desert habitat loss, including potential habitat for desert tortoise and the Mojave fringe-toed lizard. In addition, unless the dry-cooling alternative is adopted, the Project will utilize approximately 1,644 acre-feet of groundwater per year, resulting in significant groundwater impacts. We therefore have significant concerns about the impacts to desert plant and wildlife communities which we urge the BLM to address fully.

Biological Resources: The Project area is potential habitat for a number of special-status plant and animal species and the DEIS fails to fully consider impacts to many of these species, including desert tortoise, Mojave fringe-toed lizard, Couch's spadefoot toad, Nelson's bighorn sheep, and groundwater dependant plant species.

First, the applicant indicates that the Project area is unoccupied by desert tortoise and that the majority of the site is not suitable habitat for desert tortoise. DEIS at C.2-34. However, agency staff concluded that the entire site contains suitable desert tortoise habitat and that the site could be potentially occupied by desert tortoise in the future. Id. at C.2-34. The document concludes that "although the project contributes a relatively small percentage of lower quality habitat, it contributes to a significant cumulative effect to an imperiled species." Id. at C.2-120. Furthermore, the NECO plan includes a desert tortoise recovery objective to "mitigate effects on desert tortoise populations and habitat outside DWMAs to provide connectivity between DWMAs." Given the threats posed by global climate change, maintaining habitat connectivity is particularly important. Id. We urge the BLM to ensure that impacts to desert tortoise habitat and connectivity are minimized.

Second, the Project will have significant impacts on Mojave fringe-toed lizards, including directly impacting 28 acres of stabilized/partially stabilized sand dune habitat and 38 acres of playa/sand drifts over playa, and indirectly impacting 453 acres of habitat downwind of the Project site. Id. at C.2-68. We urge BLM to consider in its alternatives analysis an alternative Project site that avoids significant impacts to Mojave fringe-toed lizard habitat.

Third, the Project is located at the western border of the Couch's spadefoot toad range. Id. at C.2-78. The DEIS states that "[n]o Couch's spadefoot toads were observed during surveys; however, because of the short time this species is above ground, and because the surveys were not conducted during the proper season (i.e., after summer rains), the lack of observations does not suggest the species is absent from the Project site." Id. at C.2-36. Without an accurate assessment of Couch's spadefoot toad on the property, it is not possible to conclude that the proposed mitigation (BIO-27) would reduce Project impacts to less than significant levels. We urge BLM to adequately document and consider the impacts of the Project on the Couch's spadefoot toad.

Fourth, the DEIS concludes that "[n]o sign or evidence of Nelson's bighorn sheep were found during field surveys and bighorn sheep are not expected to occur in the Project area. The Project Area is not within a known bighorn sheep corridor as identified in the NECO Plan." Id. at C.2-42. However, the applicant's surveys of the main Project site were conducted within a very narrow timeframe during the spring of 2009. Additional studies should be conducted before concluding that the Project will not impact bighorn sheep.

Finally, of significant concern regarding impacts to groundwater dependant vegetation is the significant uncertainty surrounding the groundwater calculations.

> [T]he calculations and assumptions used to evaluate potential Project impacts to groundwater levels are imprecise and have limitations and

> uncertainties associated with them. Given this uncertainty, the magnitude of potential Project impacts that could occur to groundwater dependent plant communities cannot be determined precisely.

DEIS at C.2-98. Water in arid areas, even brackish water, is an incredibly valuable resource, not only to the groundwater dependant plant species, but also to animal populations that depend on these plants. We expect to see greater certainty related to impacts to groundwater and by association overall biological resources in the final EIS.

Water Resources: This Project proposes to utilize approximately 1,644 acre-feet of groundwater per year which would impact groundwater levels in the area. *See* id. at C.9-5. This project is the *only* fast track project on public lands in California proposing to use wet cooling. The Project would also disrupt the natural flow of surface water from Palen Wash onto Ford Dry Lake by re-routing ephemeral drainages through engineered channels. *See* id. at C.9-63.

Because of impacts to groundwater resources, we urge the BLM to adopt the dry-cooling alternative. In addition, we urge BLM to further analyze the Project's effects on groundwater levels.

The DEIS states that because

> [t]he cumulative change in storage over the construction and operational period (33 years) would amount to approximately 57,000 af, which would equate to less than 0.5 percent of the total amount of the estimated total recoverable groundwater in storage (15,000,000 af)...the project's contribution to the cumulative impact to basin balance is less than cumulatively considerable.

DEIS at C.9-72. However, this calculation overlooks the biological and hydrological impacts of aquifer overdraft. BLM also fails to support its concluding statement that cumulative effects of groundwater depletion would be insignificant. *See* id. at C.9-72. Finally, the potential for long-term drought or climate change effects on groundwater recharge and groundwater-dependent resources have not been evaluated. We urge BLM to consider these factors.

It is an engineering challenge to redesign desert washes. The proposed action would remove these waterways, eliminating their hydrological and biological functions and impeding wildlife movement through the washes, id. at C.9-56, C.2-66, and re-route them through three engineered channels. Id. at C.9-57, C.2-66. Engineered channel design is based on current conditions and the 100-year flood and is not finalized. Id. at C.2-66. An increase in the frequency or duration of extreme rainfall events may change upstream and downstream surface water features, soil moisture and the frequency and characteristics of the 100-year flood. BLM must evaluate the effects of climate change on surface water hydrology, the reasonableness of the assumptions behind the 10-, 25- and 100-year flood modeling, the efficacy of the engineered channels and the ecological and mitigation values of the waterways to be acquired and protected in a climate-changed environment and use this information to produce more reliable findings of significance. This information can also remedy deficiencies in the drainage report and improve any FLO-2D analysis and drainage channel design. Because of the impacts to natural drainage channels, we urge BLM to consider additional alternatives, including an alternative site that avoids desert washes or an engineering alternative on the current site that avoids reengineering the drainage channels.

Water Availability: Groundwater analysis suggests that any groundwater produced at the site would be Colorado River water. DEIS at C.9-46. The Boulder Canyon Project Act, 43 U.S.C. § 617 *et seq.*, and the Supreme Court Decree in *Arizona v. California*, 547 U.S. 150 (2006), require anyone who uses Colorado River water to have a contract with the Secretary of the Interior for the use of such water. All Colorado River water apportioned for use in California is already under contract. New users, such as the applicant, could seek a water delivery subcontract with the City of Needles (via the Lower Colorado Water Supply Project), a water transfer or exchange agreement with an existing contractor in California or seek a water supply that is not connected to the Colorado River.

Given that all Colorado River water in California is already under contract and that the Lower Colorado Water Supply Project is not a viable option for the applicant, *see* Letter from Gerald R. Zimmerman, Exec. Dir., Colorado River Board, to Alan H. Solomon, California Energy Comm'n (March 22, 2010), the applicant would have to enter into an agreement, to be approved by the Bureau of Reclamation, with another contractor, the Metropolitan Water District of Southern California ("MWD") in order to perform wet cooling at the proposed site. MWD's water supply may be vulnerable to shortages due to shortages on the Colorado River, in northern California, or from other sources of supply. Given these conditions and with the lower Colorado River over-appropriated and in the midst of drought conditions, we recommend that BLM require the applicant to utilize dry cooling for the proposed project.

Cultural Resources: The BLM must fully consider the comments submitted by the Quechan Tribe (see Quechan Tribe comments dated February 16, 2010 on the Section 106 Consultation Process for the First Solar Desert Sunlight, Palen Solar; Ford Dry Lake Solar; and Blythe Solar Projects) regarding the Section 106 process. BLM should insure that the regulatory approval schedule allows adequate time to consult with tribes before the Record of Decision is issued.

DEIS Elements: Our concerns with the draft environmental review document itself relate to five key elements: the purpose and need statement, the alternatives considered, the cumulative impact analysis, climate change and new information.

The DEIS states that the BLM's purpose and need is "to respond to" the company's Right-of-Way application. DEIS at B.2-10. The BLM should avoid both this mindset as well as too narrow a statement of purpose and need in order to help ensure that its EISs are legally defensible documents. In place of the statement that was used here, our organizations urge the adoption of the following to achieve these goals:

> The purpose of the proposed action is to "facilitate environmentally responsible commercial development of solar energy projects"[2] consistent with the statutory authorities and policies applicable to the Bureau of Land Management, including those providing for contributions towards achieving the renewable energy and economic stimulus and renewable energy development objectives under the Energy Policy Act of 2005 (EPAct), the American Recovery and Re-Investment Act, and Presidential and Secretarial orders as well as the Federal Land Policy and Management Act (FLPMA).

[2] This quotation is from Secretary Salazar himself.

> The need for this action is to implement Federal policies, orders and laws that mandate or encourage the development of renewable energy sources, including the Energy Policy Act of 2005, which encourages the Department of the Interior to seek to approve at least 10,000 MW of non-hydropower renewable energy on public lands by 2015, and the Federal policy goal of producing 10% of the nation's electricity from renewable resources by 2010 and 25% by 2025; to enable effective implementation of the economic incentives for qualifying projects intended by the American Recovery and Reinvestment Act; and to support the State of California's renewable energy and climate change objectives, consistent with BLM's mandates and responsibilities under FLMPA.

This kind of purpose and need statement would clearly satisfy applicable legal requirements, *see, e.g.*, Nat'l Parks Conservation Ass'n v. BLM, 586 F.3d 735 (9th Cir. 2009), and thus help ensure that environmentally acceptable projects will not only be permitted but will also be built without unnecessary delays.

Alternatives Analysis: We applaud the inclusion of a dry-cooling alternative. Because of the shallow groundwater table, and the potential impacts the Project may have on groundwater-dependant plant communities and other biological resources in the area, we urge BLM to adopt this alternative. However, the current alternatives analysis is inadequate and we urge the BLM to include additional alternatives in its alternatives analysis, including an alternative site.

In defining what is a reasonable range of alternatives, NEPA requires consideration of alternatives "that are practical of feasible" and not just "whether the proponent or applicant likes or is itself capable of carrying out a particular alternative." Even "an alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable." Council on Environmental Quality, Forty Most Asked Questions; 40 C.F.R..§§ 1502.14, 1506.2(d). We therefore urge BLM to consider, among other alternative sites, the Gabrych Alternative – a privately owned site with one owner – in its alternatives analysis. Without an alternative site, it is difficult for the reader to evaluate the biological impacts of the Project, including impacts to desert tortoise and Mojave fringe-toed lizards. Although the project may now be sited on the best portion of the originally-proposed project site, it is not clear that this is the most appropriate, or even an appropriate, site for the project. We also urge the BLM to combine alternatives, for example by combining the dry-cooling alternative with an alternative site. We urge the BLM to include additional options in order to establish a real range of alternatives as well as to provide readers with a fuller understanding of the tradeoffs inherent in the other "action" alternatives.

Cumulative Impacts: In order to properly site renewable energy projects, it is essential that a cumulative impacts analysis be conducted to fully evaluate the implications of this type of development on public lands. There are several proposed solar and wind projects in the vicinity of the Genesis Solar Energy Project that will contribute to overall cumulative impacts to sensitive resources in this area. A list of existing and future foreseeable projects is included in the draft EIS. DEIS B.3-6 to B.3-16. In addition, the DEIS utilizes qualitative information about these existing and foreseeable projects to develop estimates and model impacts on key topics such as air quality and biological resources. More quantitative information is necessary to supplement this quantitative material.

In addition to the proposed solar and wind projects, the DEIS identifies nineteen commercial and residential development projects, several transmission line projects, a proposed landfill, and several

other projects that will also contribute to cumulative impacts. DEIS B.4-11 to B.4-16. While these projects are not all being permitted by the Bureau, all reasonable efforts must be made to obtain information regarding their potential impacts and construction timing so that a full picture of cumulative impacts can be presented in the final EIS.

Climate Change Impacts: The DEIS's discussion of climate change focuses on the reduction of greenhouse gases and the development of renewable energy resources. That is, it looks at the effects of the proposed action on climate change. It does not, however, analyze the impacts of climate change on species of concern in the project area or on their habitats. The latter impacts are clearly relevant. *See, e.g.*, Secretarial Order 3289, Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources (February 22, 2010). Such an analysis will allow the BLM to assess and reduce the vulnerabilities of the proposed action to climate change, integrate climate change adaptation into the proposed action and alternatives and produce accurate predictions of environmental consequences of the proposed actions and alternatives.

New Information: Lastly, we are concerned about the new information that will be developed after the DEIS was printed and released. In particular, there is an extensive list of information that is not yet available for public review and/or integration into the environmental analyses contained in the DEIS. For example, according to the draft the BIO-7 Biological resources Mitigation and Monitoring Plan, the BIO-17 Impact Avoidance and Minimization Measures for the American Badger and Desert Kit Fox, BIO-22 Mitigation for Impacts to State Waters, and BIO-25 Groundwater Dependant Vegetation Monitoring Plan have yet to be completed and/or presented to the public. DEIS at C.2-165, C.2-183, C.2-194, C.2-199. All of this information plus many more similar measures and plans are clearly relevant to this project and the analyses and conclusions presented in the DEIS.

BLM should make every effort to ensure that all this new information is made available to the public (and other agencies) for comment along with assessments and analyses of the information. Public input on agency proposals is one of the hallmarks of NEPA review and it is to prevent the undermining of that critical aspect that limits have been imposed on agency efforts to "load up" final EISs with excessive amounts of new information.

In conclusion, the impacts to the resources identified in these comments and to other desert resources must be fully analyzed and mitigated through the BLM process. As we have previously noted, renewable development is not appropriate everywhere on the public lands and must be balanced against the equally urgent need to protect unique and sensitive resources of the CDCA. California is lucky indeed that we have sufficient renewable resources, including solar resources, to do their development in an environmentally responsible manner.

Thank you in advance for considering our comments. If you have any questions about them, please do not hesitate to contact us.

Sincerely,

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Natural Resources Defense Council

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