UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

May 2, 2011

Department of the Interior
Bureau of Land Management
Attn: Ms. Linda Resseguie
BLM Solar PEIS Project Manager
1849 C Street, N.W., Room 2134LM
Washington DC, 20240

Subject: Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States [CEQ# 20100466]

Dear Ms. Resseguie,

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Programmatic Environmental Impact Statement (PEIS; Solar PEIS; Draft PEIS) for Solar Energy Development in Six Southwestern States, including Arizona, California, Colorado, New Mexico, Nevada, and Utah. Our review was conducted pursuant to Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR Parts 1500-1508). EPA Region 9 has coordinated with EPA Regions 6 and 8 and EPA Headquarters to provide these comments.

EPA strongly supports the Bureau of Land Management (BLM) and Department of Energy (DOE) efforts to develop a new Solar Energy Program. Accelerating the pace of development of renewable energy resources, such as solar power, will help the nation meet its energy demand, create new jobs, reduce our dependence on imported oil, and provide for increased energy security, while reducing greenhouse gas emissions. As with any program of this magnitude, thoughtful planning is critical to avoid and minimize unintended adverse consequences.

Based on our review of the Draft PEIS, we have rated the document as *Environmental Objections – Insufficient Information* (EO-2). An "EO" signifies that EPA's review of the Draft PEIS has identified potential significant environmental impacts that should be avoided in order to provide adequate protection for the environment, including but not limited to disruption of surface and groundwater hydrology, and fragmentation of desert ecosystems. A Category "2" rating signifies that EPA has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the Draft PEIS, which could reduce the environmental impacts of the action. In the enclosed detailed comments, we have identified issues of concern, along with specific recommendations for your consideration.

Our goal in provided detailed comments is to assist BLM and DOE in disclosing necessary information in the Final PEIS and to help develop consistent measures to avoid, minimize, or mitigate the adverse impacts of solar development. While we agree with the objectives of BLM's proposed Solar Energy Program, we believe that proceeding with the proposed action would set a precedent for future project-level actions that, cumulatively, could result in significant environmental impacts. Other reasonable alternatives are available that could reduce the significance of the environmental impacts and appear to be more consistent with BLM's policy[1] to facilitate environmentally responsible development of solar (and wind) projects. To avoid unnecessary delays of future projects, it is critical that potential conflicts be identified and avoided to the extent possible from the outset. EPA agrees with BLM's initial approach to focus on the concept of establishing Solar Energy Zones (SEZs). That, in conjunction with the identification of disturbed lands, would be the most efficient way to streamline the application and permitting process. EPA recommends that BLM:

- Identify and apply a more comprehensive set of exclusion criteria – such as those being applied in BLM's Restoration Design Energy Project (RDEP) in Arizona, in combination with criteria proposed by the U.S. Fish and Wildlife Service in California and Nevada – to redefine the proposed SEZs, in consultation with federal resource management field offices and tribes.

- Apply the more comprehensive exclusion criteria to the 21.5 million acres to identify new SEZs.

- Focus substantial effort on building a comprehensive database of disturbed and degraded lands – on public, private, and tribal lands – to which developers can be directed in the future. BLM should consider soliciting the public for identification of disturbed land throughout the states covered by the PEIS, using an approach similar to that employed for the Arizona RDEP. Through the *RE-Powering America's Land* initiative, EPA has worked to develop maps showing contaminated lands with renewable energy potential.

- Discuss the proximity *and capacity* of existing transmission facilities to support new solar development and include an estimate of the costs and potential impacts associated with building new lines or upgrading existing infrastructure. As an integral component of solar energy development and a '*connected action*,' the development of transmission facilities must be analyzed in greater detail in the Final PEIS.

- Strengthen the language used to describe the proposed 'design features' to ensure consistency in their application and interpretation. The routine use of qualifying phrases such as '*shall be avoided to the extent practicable*' should be avoided.

[1] Instructional Memorandum No. 2011-061: Solar and Wind Energy Applications – Pre-Application and Screening, February 7, 2011.

Results of the above process should be clearly summarized and illustrated in the Final PEIS to allow public review prior to issuance of the Record of Decision (ROD).

We appreciate the opportunity to provide comments on the Draft PEIS, and look forward to working closely with BLM and DOE to resolve the issues that we have identified and help facilitate the nation's much needed shift to renewable energy sources. When the Final PEIS is published in the Federal Register, please send one hard copy and one CD to the address above (mail code: CED-2) at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at 415-972-3843, or contact Ann McPherson, the lead reviewer for this project. Ann can be reached at 415-972-3545 or mcpherson.ann@epa.gov.

Sincerely,

/s/

Enrique Manzanilla, Director
Communities and Ecosystem Division

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

Cc: John Blevins, U.S. Environmental Protection Agency, Region 6
Larry Svoboda, U.S. Environmental Protection Agency, Region 8
Susan Bromm, U.S. Environmental Protection Agency, Washington DC
Jane Summerson, Department of Energy, Washington DC
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Jim Kenna, Bureau of Land Management, Arizona State Office
Linda Rundell, Bureau of Land Management, New Mexico State Office
Juan Palma, Bureau of Land Management, Utah State Office
Helen Hankins, Bureau of Land Management, Colorado State Office
Jill Ralston, U.S. Fish and Wildlife Service, Nevada Fish and Wildlife Office
Amadee Brickey, U.S. Fish and Wildlife Service, California Fish and Wildlife

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 PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES, MAY 2, 2011

Project Description

The Department of Energy (DOE) and the Bureau of Land Management (BLM) have worked jointly to prepare this Programmatic Environmental Impact Statement (PEIS; Solar PEIS, Draft PEIS). The BLM proposes to develop a new Solar Energy Program to further support utility-scale solar energy development on BLM-administered lands that would apply to all pending and future solar energy development applications upon execution of the Record of Decision (ROD) (pg. ES-2). For the BLM, the PEIS presents three alternatives: 1) Solar Energy Development Program alternative (preferred alternative); 2) Solar Energy Zone (SEZ) Program alternative; and 3) a No-Action alternative. Under the Solar Energy Development Program alternative, new program administration and authorization policies and design features for utility-scale solar energy development would be identified, and 21.5 million acres of BLM-administered land would be available for right-of-way (ROW) application, including land in the 24 SEZs. Under the SEZ Program alternative, the same new program administration and authorization policies and design features would be applied, but solar energy development would be restricted to the 24 SEZs (677,400 acres). Under the No-Action alternative, solar energy development would proceed pursuant to BLM's existing polices, on a project-by-project basis, within about 99 million acres of BLM-administered land currently open for ROW authorizations.

For the DOE, the PEIS examines two alternatives: 1) Programmatic Environmental Guidance alternative; and 2) a No-Action alternative. Under the first alternative, DOE would use the information in the PEIS to develop guidance with recommended environmental practices and mitigation measures for all solar energy projects supported by DOE. Under the no-action alternative, DOE would continue its existing case-by-case process for addressing environmental concerns for solar projects supported by DOE.

Alternatives Analysis – Analysis of a Full Range of Alternatives

Other reasonable alternatives are available that would help reduce the significance of the environmental impacts of future projects.

The U.S. Environmental Protection Agency (EPA) supports BLM and DOE in their efforts to develop a new Solar Energy Program. The Solar Energy Program that BLM and DOE are establishing is a monumental undertaking; consequently, particular care must be exercised while implementing this program due to the fragility of the ecosystems involved and the magnitude, extent, and duration of potential environmental impacts. We do not believe that the PEIS provides sufficient justification for leaving 21.5 million acres of land open to utility-scale solar energy development at this time – considering the myriad of resources that may be affected by such a decision, and the availability of potentially less damaging alternatives.

Since this is a new program that includes the deployment of new technologies on an unprecedented scale, we believe that designation of smaller, more targeted geographic areas, at

least initially, would be more prudent than designating such vast acreages as are proposed in the Preferred Alternative for utility-scale solar energy development. Other reasonable alternatives are available that could reduce the significance of project-level environmental impacts and appear to be more consistent with BLM's policy[2] to facilitate environmentally responsible development of solar (and wind) projects.

Several federal orders and statutes establish goals and requirements related to renewable energy, such as Secretarial Order 3285A1, which directs BLM and other Department of Interior (DOI) agencies to identify and prioritize the specific locations best-suited for such development, and the Energy Policy Act of 2005, which calls for 10,000 megawatts (MW) of non-hydropower renewable energy on public lands by 2015. According to the PEIS, the DOI is well on its way to accomplishing the Energy Policy Act goal, as more than 5,489 MW have already been approved (1,350 MW geothermal, 567 MW wind, and 3,572 MW solar; pg. 1-2). In March 2011, BLM announced a list of 20 "priority" projects[3] for developing renewable energy on public lands in 2011. The priority list now includes ten solar projects, five wind projects, and five geothermal projects – totaling some 4,536 MW – all expected to complete the environmental review process and have the potential for approval by the end of 2011. With the addition of the 2011 priority projects, it seems likely that DOI will reach 10,000 MWs in 2011 or 2012, well ahead of the Energy Policy Act goal. President Obama's comprehensive energy plan, *Blueprint for a Secure Energy Strategy*,[4] confirms this, as it specifically refers to DOI's commitment to issue permits for 10,000 MWs of renewable power generated from new projects on public lands by 2012.

While that objective represents only a fraction of our national renewable energy potential, it is an important benchmark cited as a driver for both the PEIS and other renewable energy projects currently under review. Under the Reasonably Foreseeable Development Scenario (RFDS), BLM and DOE estimate that 214,000 acres of BLM-administered land (24,000 MW) and 71,000 acres of private land (8,000 MW) will be necessary to support the estimated amount of solar energy generated over the next 20 years in the six-state region. Although EPA strongly supports the development of renewable sources to meet a far greater portion of the nation's energy needs, we believe that the selection of the preferred alternative, as described in the Draft PEIS, would be ill-advised at the present time.

Recommendations:

EPA recommends that the alternatives analysis be broadened to examine new reasonably available alternatives that will reduce the significance of environmental impacts associated with the proposed action and that are more consistent with BLM's policy to facilitate environmentally responsible development of solar (and wind) projects.

EPA recommends selection of an alternative that would consolidate utility-scale solar energy development in smaller, well-designated areas with fewer resource constraints, target disturbed or degraded lands, and include a commitment to conduct rigorous

[2] Instructional Memorandum No. 2011-061: Solar and Wind Energy Applications – Pre-Application and Screening, February 7, 2011.
[3] See internet address: http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/priority_projects.html
[4] See internet address: http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf

environmental reviews (EISs) when appropriate.

The FEIS should apply additional exclusion criteria to delineate SEZs with fewer resource conflicts, while giving preference to disturbed and degraded lands.

EPA supports the concept of establishing SEZs; however, we are not convinced that the SEZs proposed in the PEIS represent the most appropriate areas in which to concentrate utility-scale solar development. During the past year, EPA Region 9 reviewed 14 Draft EISs and 9 Final EISs for utility-scale solar energy projects located in California, Nevada, and Arizona. Several of these projects[5] are located in, or very close to, proposed SEZs. Resource conflicts involving, among other issues, groundwater consumption, surface-water hydrology, and habitat destruction, were identified at a number of the proposed project sites.

To avoid unnecessary delays of future projects, it is critical that potential environmental and cultural conflicts be identified and avoided to the maximum extent possible from the onset. The key lies in establishing a more robust set of land exclusion criteria and additional screening analyses that will enable BLM to identify and avoid those areas with the most significant resource constraints when drawing SEZ boundaries, and giving preference to disturbed and degraded lands. The exclusion criteria identified in table 2.2-2 that were used to identify the 21.5 million acre alternative provide a good start; however, it is difficult for the reader to discern what they actually represent, given their reliance on generic references to various land-use plans. In fact, it is not clear to us how the SEZs were selected or what additional criteria were used to delineate the SEZs within the 21.5 million acres, although we searched for clarification on that topic in the PEIS (pg. 2-10).

Table 6.1-3 in the PEIS summarizes the acreages of SEZs with possible development restrictions. It is unclear, however, whether BLM intends to modify those SEZs' boundaries based on these potential restrictions. Many cooperating agencies, as well as environmental groups, have already submitted detailed comments requesting that BLM eliminate some SEZs or modify the boundaries (for example, Pisgah, Iron Mountain, Riverside East, and Amargosa Valley), or that BLM identify new SEZs (Western Mojave).[6] Furthermore, we understand that the U.S. Fish and Wildlife Service (FWS) has identified additional exclusion criteria that, if applied, would result in a more protective approach based on the conservation of sensitive species, preservation of additional habitat and habitat connectivity corridors, and recovery of certain targeted species, including the desert tortoise.

Recommendations:

EPA recommends that BLM identify a more robust set of exclusion criteria – such as those being applied in BLM's own Restoration Design Energy Program (RDEP) in Arizona, and the criteria proposed by the FWS in California and Nevada – and utilize those criteria to reconfigure the proposed SEZs. These exclusion criteria can also be

[5] Projects that are located in the Riverside East SEZ in California include: Palen, Blythe, Genesis, and Desert Sunlight. The Amargosa Farm Road solar energy project is located near the Amargosa Valley SEZ in Nevada.
[6] The California Desert and Renewable Energy Working Group submitted a proposal for draft study areas in the western Mojave region of California in April 2009 and December 2010 encompassing up to 108,000 acres.

applied to the 21.5 million acres to delineate entirely new SEZs.

EPA recommends that BLM and DOE work closely with the FWS, state fish and game agencies, federal and state resource field offices, and other ecosystem experts to ensure that adequate habitat is maintained for species at risk and habitat corridors remain intact.

EPA further recommends that preference be given to disturbed or degraded areas and the avoidance of cultural and resource conflicts within the new delineated SEZs.

Any such revisions should be clearly summarized and illustrated in the Final PEIS, so that the public has the opportunity to review these changes prior to issuance of the ROD.

Preference for solar development should be given to disturbed and degraded lands.

Utilizing previously disturbed sites or areas adjacent to previously disturbed or developed sites is listed as a screening criterion in BLM's Instructional Memorandum (IM) No. 2011-061; yet, while the PEIS acknowledges that the use of disturbed land, rather than pristine lands, should be encouraged, it does not identify a way in which solar developers could be guided toward such properties. EPA has worked closely with the DOE's National Renewable Energy Laboratory (NREL) to develop maps[7] showing contaminated lands and mining sites with renewable energy generation potential. These maps were developed in conjunction with the *RE-Powering America's Land: Renewable Energy on Contaminated Land and Mining Sites* program,[8] which was launched by the EPA Office of Solid Waste and Emergency Response (OSWER) in September 2008. Under this initiative, EPA has taken a multi-pronged approach[9] to encouraging reuse of EPA tracked lands[10] for clean and renewable energy production facilities. EPA has developed a Renewable Energy Interactive Mapping Tool[11] that utilizes Google Earth to display these sites.

RE-Powering America's Land promotes renewable energy development on disturbed or degraded land, whether or not it is part of the current EPA database of contaminated sites. Through this initiative, EPA has identified more than 11,000 EPA tracked sites and nearly 15 million acres that have renewable energy potential (solar, wind, biomass, and geothermal). Within the six state area that the PEIS covers, the numbers break down as follows: Arizona – 122 sites – 84,000 acres; California – 1,262 sites – 1,972,000 acres; Colorado – 405 sites –

[7] To develop the maps, EPA and NREL collected renewable energy resource information and merged it with EPA and state data on contaminated lands and mining sites across the country. The mapping analysis applied basic screening criteria, such as distance to electric transmission lines, distance to roads, renewable energy potential, and site acreage in order to identify EPA tracked lands that might be good candidates for solar, wind, or biomass energy production facilities.

[8] For additional information on EPA's RE-Powering America's Land, please use the following weblink: http://www.epa.gov/renewableenergyland/index.htm

[9] See Internet site: http://www.epa.gov/renewableenergyland/docs/repower_contaminated_land_factsheet.pdf.

[10] EPA tracks Abandoned Mine Lands, Brownfields, Resource Conservation and Recovery Act (RCRA) sites, Federal Superfund Sites, and Non-Federal Superfund Sites.

[11] See Internet site: http://www.epa.gov/renewableenergyland/mapping_tool.htm. Open the Renewable Energy Interactive Map (KMZ) to launch the Renewable Energy Mapping Tool. More detailed information on the EPA tracked sites is available at: http://epa.gov/renewableenergyland/maps/ocpa_renewable_energy_data.xls.

503,000 acres; New Mexico – 69 sites – 3,314,000 acres; Nevada – 156 sites – 77,000 acres; Utah – 126 sites – 903,000 acres. Many such properties may have existing transmission capacity and infrastructure in place, as well as adequate zoning. EPA is, in fact, currently soliciting[12] applications from tribes, regional governments, and communities that want to evaluate the potential development of renewable energy on potentially or formerly contaminated properties; applications are due on May 20, 2011.

Although the PEIS mentions the *RE-Powering America's Land* initiative, it concludes that the types of contaminated properties it has identified so far are not likely to coincide substantially with BLM-administered public lands (pg. 2-27). Rhetorically, BLM promotes the concept of using disturbed sites by including it as a potential mitigation measure, stating that, to the extent practicable, projects should be sited on previously disturbed lands close to energy load centers to avoid and minimize impacts on remote undisturbed lands (pg. 5-126). Furthermore, the PEIS states that DOE may elect to establish programmatic guidance that promotes utility-scale solar development on previously disturbed lands (pg. 2-27); however, the concept is not developed further in the PEIS and no such lands are actually identified in the PEIS.

EPA is in the process of examining its own inventory of contaminated sites to determine which sites are on BLM land. We expect to finalize that list in the near future[13] and would like to work with BLM to ensure that the list is made public and integrated into the Final PEIS. Sites in the database range in size from small, one-acre sites up to thousands of acres. While development of utility-scale solar necessitates large tracts of land, contaminated sites with small-to-medium acreage should not be dismissed, because contaminated acreage might be combined with nearby undisturbed land to meet the acreage requirements needed for large-scale solar projects. Many of the disturbed sites may already be zoned for industrial/commercial application, and may have infrastructure in-place, including access to roads, water, and electrical transmission lines. Additionally, some of the disturbed mining sites may have been the subject of EIS studies that may be useful. The use of contaminated sites provides a win-win opportunity for BLM and other land management agencies to maximize the opportunities for cleanup and reuse.

EPA is aware of many large, recently active, but currently closed, mines on BLM land in Nevada. The Nevada Department of Environmental Protection (NDEP) currently tracks over 100 "modern" mines that have undergone permanent closure or are in post-closure monitoring, many of which are partly or completely on BLM land. Many of these have closed tailings, waste rock, or heap leach facilities that exceed 100 acres, and currently have (or had recently) nearby power infrastructure in place. These sites, as well as similar sites in other Western states, should be screened for solar energy development potential and the list be made public in the Final PEIS.

In addition to contaminated and former mining sites, lands that have been used previously for agriculture may be suitable for solar development, particularly when such land lies in close proximity to transmission lines. For example, the Westlands Solar Park is a 5,000 MW project proposed on 30,000 acres of disturbed private land in California's Central Valley that has been

[12] See Internet site: http://www.epa.gov/renewableenergyland/docs/repowering_epa_nrel_2011_rfa.pdf

[13] Lura Matthews, US EPA, OSWER, 202-566-2539, will serve as the primary point of contact and will submit the final list to BLM and DOE. EPA anticipates that the list will be ready in June/July 2011.

rendered unusable by salt buildup from long-term intensive irrigation and has been targeted for renewable energy development. Furthermore, several of the large solar projects in California that underwent joint National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) review last year examined and dismissed alternative sites that involved disturbed land, including degraded agricultural areas. Although the sites were not selected for those particular projects, they may be viable candidates for further consideration for other solar development.

To summarize, EPA believes that there are many disturbed, degraded, and contaminated sites located on federal, state, tribal, and private land that may be suitable for solar energy development. Identifying and utilizing these areas first, instead of using more pristine land, would seem to be in-line with Secretarial Order 3285A1, which calls for encouraging timely and responsible development of renewable energy and associated transmission while protecting and enhancing the Nation's water, wildlife, and other natural resources. EPA also believes that the permitting process is likely to be less daunting and, in fact, quicker and easier, if such lands are utilized. Maximizing the use of disturbed and degraded lands should be a more prominent component of BLM's new Solar Energy Program and any forth-coming guidance issued by DOE. In addition, directing development to disturbed and degraded areas on tribal lands would likely provide a much needed economic opportunity to those tribes, consistent with DOE's recently established Tribal Energy Program Office's stated mission.

Recommendations:

EPA strongly recommends that BLM focus substantial effort on identifying disturbed, degraded, and contaminated lands and building a comprehensive database cataloguing such lands – public, tribal, and private – to which solar energy developers can be directed.

BLM and DOE should consider developing specific incentives to direct developers to disturbed, degraded, or contaminated lands. For example, such incentives might include prioritized processing of ROW applications or loan guarantee applications for projects located on such lands.

EPA recommends that BLM consider soliciting the public for input on disturbed sites that may be suitable for solar energy development, as done with the Arizona RDEP.[14]

EPA plans to submit a list of contaminated sites tracked in our database that are located on or near BLM-administered lands in the six-state area. The Final PEIS should publish this list and screen these sites for solar energy development potential. Developers can and should work with EPA or State environmental offices to determine reasonable steps that can be taken to address any environmental liability issues at the project level stage.

BLM should work closely with the NDEP and other state environmental agencies to examine recently active, but currently closed, mine sites on BLM land suitable for solar energy development. We recommend that these sites, as well as similar sites in the other

[14] See Internet address: http://www.blm.gov/az/st/en/prog/energy/arra_solar.html

five southwestern states, be screened for solar energy development potential and identified in the Final PEIS.

Alternative sites utilizing disturbed land that were identified in the NEPA or CEQA process but were not developed should be catalogued and added to the database of disturbed sites. These sites should be presented in the Final PEIS.

The text[15] on page 2-27 referring to the *RE-Powering America's Land* initiative should be revised in the Final PEIS. The *RE-Powering America's Land* initiative promotes renewable energy development on disturbed or degraded land, whether or not sites are part of the current EPA database. This database can be utilized as a tool to identify disturbed sites with renewable energy potential; EPA and BLM could work together to include contaminated BLM land in the database. The database should be discussed in greater detail in the Final PEIS.

BLM's obligations regarding existing ROW applications outside of SEZs are unclear

According to the PEIS, BLM has received more than 300 applications for ROW authorizations for solar facilities to date. As of December 1, 2010, BLM had 104 active applications, including 30 in California, 35 in Nevada, 36 in Arizona and 3 in New Mexico (pg. 1-9). EPA is currently tracking 36 applications in California, 63 applications in NV, and 32 applications in AZ. The above numbers are continually fluctuating; however, of the 132 applications that we are tracking, approximately 18 are located in the proposed SEZs and 84 are located outside those zones, but within the 21.5 million acres, which leaves approximately 30 applications that are located outside the 21.5 million acre region. Thus, it appears that most of the solar projects that are already undergoing environmental review are not located in the proposed SEZs, but are located within the 21.5 million acres. Selection of the 21.5 million acres alternative (which, as noted above, EPA does not support) would, presumably, enable those developers to move forward with their applications, and perhaps streamline the process for them. The Solar PEIS, however, does not describe what would happen to the existing ROW applications should they be located outside the selected alternative.

Recommendations:
The Final PEIS should clarify what the status of the existing ROW applications would be in the event an SEZ-based alternative is selected, including whether or not BLM would have any obligation to continue processing those existing applications located outside the proposed SEZs.

The Final PEIS should use maps to illustrate the locations of the active ROW applications, as well as the GIS layers representing the alternatives.

[15] In addition, the U.S. Environmental Protection Agency has launched the RE-Powering America's Land initiative to promote the siting of renewable energy production facilities on contaminated land; however, the types of contaminated properties it has identified are not likely to coincide substantially with BLM-administered public lands."

Consider allowing a limited number of ROW applications to proceed if they meet additional screening criteria

Another alternative which deserves further consideration would be to limit future utility-scale solar development applications to the reconfigured SEZs or newly defined SEZs, and to continue processing a selected subset of existing ROW applications within the 21.5 million acres that have been screened in accordance with the newly defined exclusion criteria and BLM's recently published IMs. This would enable BLM to meet, and likely exceed, all of the objectives of its proposed Solar Energy Program without leaving 21.5 million acres of land open for further development. It could also serve as an interim measure, particularly in California and Arizona, where there are other comprehensive renewable energy planning efforts underway, including the California Desert Renewable Energy Conservation Plan (DRECP) and the Arizona RDEP.

Recommendation:
The Final PEIS could consider an alternative that would allow some existing ROW applications to proceed after applying more robust screening criteria and seeking input from BLM field office staff. Preference should be given to disturbed and degraded sites and those areas with the fewest resource constraints.

Establish a process for designating new SEZs and identifying disturbed lands

The PEIS states that BLM worked closely with state and field office staff to identify the 24 proposed SEZs; however, the process and criteria used to select them is not clearly defined in the PEIS (pg. 2-10) – nor is it clear whether BLM anticipates designating additional SEZs in the future.

Recommendations:
The Final PEIS should elaborate on how each of the proposed SEZs was selected.

The Final PEIS should establish a process for identifying and designating newly defined SEZs using public input. The process for designating (or reconfiguring SEZs) should allow for meaningful public participation.

The Final PEIS should also establish a process for identifying disturbed, degraded, and contaminated sites that might be suitable for solar energy development. We believe that it is crucial to build a larger, more comprehensive inventory of these sites on public, private, and tribal land so that developers can also be directed to these sites in the future.

Information on distributed generation should be updated in the Final PEIS

In our scoping comments, EPA recommended that the PEIS address the feasibility of using residential and wholesale distributed generation,[16] in conjunction with increased energy

[16] Distributed generation is the use of small-scale power sources on-site that can also supply energy to a utilities distribution center. Examples include solar photovoltaic (PV) systems mounted on rooftops, commercial warehouses, or parking lots.

efficiency and conservation, as an alternative (September 2009). Alternatives incorporating distributed generation were dismissed in the Draft PEIS on the basis that promoting distributed generation would not enable BLM to meet its 'purpose and need' for the proposed agency action, which is to respond to federal orders seeking to promote renewable energy projects on public land. The federal order to which BLM is chiefly responding is the Energy Policy Act of 2005, which calls for 10,000 MWs of renewable energy on public lands by 2015. As discussed previously, the DOI will likely meet that goal in 2012. The Draft PEIS also states that this level of renewable energy generation (10,000 MW) cannot be achieved through distributed generation systems (pg. 2-24).

The California Renewable Energy Transmission Initiative (RETI) has already determined[17] that there is tremendous potential (up to 27,500 MW) associated with the development of small-scale[18] photovoltaic (PV) facilities located near existing substations in California. Recently, California's Governor Jerry Brown set a goal of bringing 12,000 MW of distributed generation and 8,000 MW of large-scale renewable projects to the grid by the end of 2020. Strategies for developing 12,000 MWs of distributed generation by 2020 include installing smaller systems (< 2 MW) on the roofs of warehouses, parking lot structures, schools, and other commercial buildings, and installing larger systems (up to 20 MW) on public and private property throughout the state.

Expanding distributed generation will help California meet its Renewable Portfolio Standard (RPS) of 30% by 2020. Sixteen states, including Arizona, Colorado, Nevada, New Mexico, and Utah have specific goals dedicated to expanding distributed generation. Arizona, for example, has an RPS of 15% by 2025; 30% of which must be obtained through distributed generation.

EPA recognizes that BLM is appropriately focused on dealing with existing ROW applications, streamlining permitting, and promoting utility-scale solar energy development on public lands. However, as a factor that could impact the scale and choice of alternatives proposed in the PEIS, distributed generation warrants further discussion within the alternatives analysis. Although the increased use of distributed generation systems may not replace the need for utility-scale systems, the extent to which distributed generation can contribute to meeting future energy needs provides important context that should inform BLM's and DOE's decision-making.

Recommendations:

The Final PEIS should present the most recent information on distributed generation in each of the six states, including policies, initiatives, RPSs and specific carve-outs designed to promote distributed generation.

The Final PEIS should discuss how distributed generation efforts in the six states could impact the scale and choice of alternatives proposed in the Final PEIS.

[17] See RETI Phase 1B Report at Internet site: http://www.energy.ca.gov/2008publications/RETI-1000-2008-003/RETI-1000-2008-003-F.PDF

[18] Small scale systems include those that are 1-20 MW in size, and 160 acres or less in size; 1,350 potential sites.

Impact of BLM's Recent Instructional Memoranda is not clear

According to BLM's IM No. 2011-061, released after the PEIS was published, lands specifically identified for solar (and wind) energy development in BLM Land Use Plans are classified as having "*Low Potential for Conflict*" – where timely or expedited authorizations are possible. EPA is concerned that, if BLM selects the Preferred Alternative and designates 21.5 million acres for solar energy development, projects located within this area would automatically be prioritized, based on the screening criteria mentioned above and new land use designations – without further analysis. We do not believe that sufficient analysis has been completed on the 21.5 million acres to justify that classification (*Low Potential for Conflict*) for projects sited in this area.

> *Recommendation:*
> EPA recommends that the Final PEIS discuss BLM's three recently published IMs (Nos. 2011-059, 2011-060, and 2011-061) in conjunction with the Solar PEIS, including whether lands identified within the Solar PEIS would be further categorized as *Low Potential for Conflict* on the basis of new land use designations, without further analysis.

Transmission Analysis

Transmission is a 'connected action' and should be thoroughly analyzed in the PEIS.

Access to electrical transmission facilities is a major factor in siting utility-scale solar facilities, and the availability of transmission capacity is an integral component of that access. Without factoring in available capacity, there is no way of knowing whether the power generated from a given solar facility can be brought to market, even if the facility is located close to an existing line. Nor are there any assurances that simply upgrading transmission lines will be enough to get the electricity to load centers. According to CEQ regulations, connected actions are actions that are closely related and, therefore, should be discussed in the same impact statement. Connected actions include actions that cannot or will not proceed unless other actions are taken previously or simultaneously (CFR 1508.25). In this case, the development of transmission facilities or capacity is a '*connected action*'[19] and as such, should be addressed in greater detail in the Final PEIS.

According to the Draft PEIS, BLM conducted a transmission constraint analysis in order to determine whether it should designate additional transmission corridors to facilitate utility-scale solar energy development. The PEIS concluded that the majority of lands with developable solar resources were not constrained from development[20] on the basis of the location of existing transmission lines (pg. 1-13). EPA is concerned that the transmission analysis, as presented in the PEIS, is too narrowly focused on proximity to existing transmission lines and designated

[19] Connected actions are actions that are closely related and, therefore, should be discussed in the same impact statement. Connected actions include actions that cannot or will not proceed unless other actions are taken previously or simultaneously (CFR 1508.25).
[20] Constrained from development was defined as being located more than 25 miles from an existing transmission line or designated corridor.

corridors. BLM does not appear to have taken a '*hard look*' at other important issues such as the available capacity on existing lines (i.e., the analysis assumed lines could be upgraded if needed), the costs associated with upgrading or building new transmission lines, environmental impacts of such actions, and the timing of new transmission and energy development projects.

EPA believes that new transmission facilities will likely be required in many, if not all, cases. For example, consider transmission in the Amargosa Valley SEZ. According to the PEIS, full build-out (80%) of the SEZ could result in 2,811 - 5,060 MW of power, but the only existing line nearby is a 138-kilovolt (kV) line. According to the PEIS, a 500-kV line could accommodate one 700 MW facility (pg. 11.1-3). In this case, substantial new transmission capacity would be required to bring electricity from the proposed Amargosa Valley SEZ to load centers. The location, size, impact, and cost of such infrastructure, including transmission upgrades, is unknown at this time.

Transmission issues must be resolved prior to the construction of any utility-scale solar energy facility. As a '*connected action,*' we consider the omission of these topics to be a serious flaw in the Draft PEIS. In the absence of a clear demonstration of adequate available transmission capacity to support solar projects within the area covered by the PEIS, EPA believes that development of additional transmission access and/or capacity is likely to be needed to support such projects.

Recommendation:
The Final PEIS should provide additional information on transmission within each of the SEZs including: 1) available capacity on existing lines; 2) costs associated with building new transmission lines or upgrading existing infrastructure; 3) potential environmental impacts associated with new transmission lines or upgrades; and 4) the timing and approximate cost of new transmission and energy development projects.

Tiering

Clear standards for determining the appropriate level of NEPA review for individual projects are needed to avoid unnecessary delays.

As is typical for a programmatic EIS, the PEIS states that NEPA analyses for site-specific proposals would tier to the PEIS. While acknowledging that it evaluated environmental effects over very broad geographic and time horizons, the PEIS also states that projects proposed in SEZs are expected to require '*limited*' additional environmental review since BLM has completed in-depth environmental analyses for the proposed SEZs as part of the PEIS. While this might be appropriate if, in fact, in-depth environmental analyses had actually been conducted for each SEZ, EPA questions the characterization of BLM's SEZ analyses as "*in-depth*" considering that surveys have not yet been completed for threatened or endangered species, aquatic resources, or cultural resources. Nor does it appear that the Draft PEIS preparers reviewed the EISs that have already been prepared for proposed projects located within the SEZ areas. In addition, EPA does not find that the Solar PEIS provides an adequate description of the

Affected Environment for the Preferred Alternative (21.5 million acres) or the No-Action alternative (99 million acres) – even on a programmatic level.

According to the PEIS, the level of subsequent, environmental analysis required under NEPA would be determined on a case-by-case basis by the BLM field office at the time a solar energy project application is received (pg. A-31). How the individual BLM field offices would make that determination remains unclear, as the PEIS does not elaborate on the mechanism, screening criteria, or thresholds that will be used by BLM field offices to distinguish what level of environmental analysis is necessary.

In an effort to better understand how BLM distinguishes between the need for an Environmental Assessment (EA), EIS, or Determination of NEPA Adequacy (DNA), we consulted BLM's NEPA Handbook (Handbook). The Handbook[21] states that one should evaluate the broader NEPA document to determine if it sufficiently analyzed site-specific effects and considered the current proposed action before one tiers to a NEPA document or uses a DNA. (Note: The PEIS specifically states that it did not assess site-specific issues associated with any future individual solar energy project). The Handbook also states that an EA may be prepared for an action with significant effects, whether direct, indirect, or cumulative, if the EA is tiered to a broader EIS which *fully analyzes* those *significant effects* (pg. 27 - Handbook). EPA does not believe that the Draft PEIS fully analyzes the significant effects associated with utility-scale solar energy development; instead, the Draft PEIS *qualitatively* discusses the *range* of *possible impacts* on resources present in the six-state study. Consequently, we believe it will be necessary to prepare tiered EISs rather than tiered EAs, even in the SEZs, for any solar project with significant impacts. The need for an EIS, rather than an EA, might be reduced if the project is located on disturbed or degraded lands or in an area without significant resource constraints.

We recognize that BLM would like to use the tiering process to shorten the environmental review process and streamline permitting. Whether or not this will be successful will depend greatly on the extent to which BLM succeeds in identifying and characterizing appropriate SEZs with low risks of resource conflicts and disturbed, degraded, or contaminated sites. More in-depth analyses and field-level surveys may be needed to make that determination in advance.

Recommendations:
EPA strongly recommends that BLM elaborate on the process that individual BLM field offices will use to assess whether an EA or EIS will be required for subsequent projects, and address this topic in greater detail and with greater transparency in the Final PEIS.

Consistent standards for determining the appropriate level of NEPA review for individual projects should be identified and implemented to ensure that tiering is done properly.

[21] See internet address:
http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf

Reasonably Foreseeable Development Scenario (RFDS)

The RFDS may underestimate the amount of solar energy developed in the next 20 years.

The Solar PEIS utilizes the RFDS to identify the range of potential impacts as well as relevant design features. Under the RFDS, up to 24,000 MW on 214,000 acres of BLM-administered lands and 8,000 MW on 71,000 acres of non-BLM lands will be developed (pg. 2-20). The Draft PEIS states that the levels are likely over-estimates of solar development through 2030 (pg. 2-21). EPA is concerned, however, that the RFDS may actually under-estimate the amount of solar energy development on both BLM-administered land and private land during the next 20 years. According to the PEIS, currently active applications for ROW authorizations already total in excess of 74,000 MW (pg. 2-22). We recognize, of course, that not all ROW applications will result in authorizations, nor will all authorizations culminate in actual solar energy facilities, yet 3,572 MW of solar energy were approved on BLM-administered lands last year, and we anticipate that at least 1,500 MW of solar energy will be approved on BLM-administered lands in 2011.

Furthermore, there is rapid deployment of renewable energy on private land, particularly in California and Arizona. Kern County and Imperial County are *each* currently processing applications for close to 3,000 MW of renewable energy on private land in California. Moreover, there are several other utility-scale solar energy projects currently proposed on private land, including a 5,000 MW project[22] in California's Central Valley that targets 30,000 acres of disturbed agricultural lands; a 1,200 MW project[23] proposed in Mojave County, Arizona; and a 700 MW project[24] proposed in Maricopa County, Arizona. Given the apparent underestimation of solar development likely to occur within the next 20 years and its associated acreage, EPA is concerned that the potential environmental impacts – in particular, cumulative impacts – may also be underestimated in the Draft PEIS.

Recommendations:

Given the explosive growth of the market and general concern about the magnitude, extent, and long-term nature of potential environmental impacts, EPA recommends that the Final PEIS elaborate on what action, if any, BLM would take if the RFDS estimates are found to be too low. For example, if the RFDS is found to underestimate the amount of solar energy development on private land, would the amount of development on BLM-administered lands be curtailed to avoid surpassing the RFDS, based on the PEIS?

[22] The Westlands Solar Park study area is comprised of approximately 30,000 acres of disturbed agricultural land that has been rendered unusable by salt buildup from long-term intensive irrigation. This land is targeted for renewable energy development and is located within the Westlands Water District in western Fresno and Kings Counties.

[23] The Sterling Solar Generating Facility is a 1,200 MW project utilizing SunCatcher technology that is proposed in Mojave County, Arizona - supported by Needle Mountain Power, LLC. See internet address: http://needlemountainpower.com/project-description/

[24] The Mesquite Solar Project is a 700 MW project utilizing PV technology that is proposed in Maricopa County, Arizona. See internet address: http://www.greentechmedia.com/articles/read/Suntech-to-Supply-800000-PV-Panels-for-Sempras-Mesquite-1/

If subsequent NEPA documentation would be required, the Final PEIS should discuss what type of documentation would be necessary in the event the RFDS is surpassed.

Cumulative Impacts

Conclusions that cumulative impacts will be minor are not well supported.

Resources in the desert are particularly vulnerable to utility-scale solar energy development. Despite a widespread perception that our deserts are relatively pristine and secure, many desert species, natural communities, and ecological processes are already severely stressed by a myriad of human-induced changes to the landscape. The Independent Science Advisors for the California DRECP[25] (Science Advisors) report that additional stress from utility-scale solar energy development, in conjunction with a changing climate, likely portends further ecological degradation and the potential for species extinctions. Ecosystem processes at the landscape level have traditionally been overlooked, but are now considered among the resources most likely to be affected cumulatively by multiple activities. The Solar PEIS states that, for desert ecosystems, complete ecosystem recovery may require up to 3,000 years (pg 5-85).

To evaluate cumulative impacts, one must determine the condition of the resource and the time required for the resource to recover from the impact of the proposed action. Since cumulative impacts often occur at the landscape or regional level, thresholds should be developed at similar scales whenever possible. Indicators at a landscape level can be used to develop thresholds as well as assess the condition of the environment. The Solar PEIS, however, only presents a cursory analysis of cumulative impacts for various resources, usually concluding that impacts will be small to minor based on appropriate mitigation. In most cases, little or no evidence is presented in support of these conclusions, nor have thresholds been identified to determine significance. In many instances, relevant topics that should have been discussed in greater detail have been neglected altogether.

Recommendation:
Biological thresholds should be established to enable BLM and DOE to direct developers to areas with the fewest resource constraints.

Soil resources

The PEIS states that overall foreseeable cumulative impacts on soil would be small to moderate with appropriate mitigation in place (pg. 6-92). In contrast, the Science Advisors recommend that every effort be made to avoid and minimize any new disturbance of soil surfaces in the siting, design, construction, and maintenance of any and all project features because ecological impacts of projects that alter surficial geology should be presumed permanent. Furthermore, the Science Advisors recommend that projects be sited in areas where they will not disrupt eolian (wind-driven) processes, such as active sand dunes. Sand dunes are part of the larger eolian systems of the California deserts and sustain alarge number of rare,

[25] Recommendations of Independent Science Advisors for the California Desert Renewable Energy Conservation Plan, DRECP-1000-2010-008-F, October 2010.

endemic species, particularly on their margins. The PEIS provides very little information on eolian processes except to note that studies may be needed to determine whether the construction and operation of a solar facility would affect the eolian processes that maintain nearby sand dunes. The PEIS also provides scant information on endemic species associated with eolian systems that would likely be impacted by solar development. For example, the Riverside East SEZ contains an active sand transport corridor that supports the endemic Mojave fringe-toed lizard.[26] The Solar PEIS, however, states that the nearest known occurrence of the species is about 25 miles north of the SEZ (pg. 9.4-173).

Recommendations:
The Final PEIS should provide additional information on wind-driven systems, sand transport areas, and endemic species associated with them. Projects should be sited in areas where they will not disrupt eolian systems, including sand source transport corridors and zones.

Every effort should be made to avoid and minimize any new disturbance of soil surfaces in the siting, design, construction, and maintenance of any and all project features.

Water resources

For many resources, it seems doubtful that large-scale solar energy development can occur without significant impacts. According to the PEIS, the cumulative impacts on water supplies could range from small to moderately high, but impacts will be constrained by the limited availability of water rights and via oversight by state and local water authorities. Large drawdowns due to solar energy demands are not expected under the RFDS, given state and local oversight of groundwater supplies and fully allocated supplies in most regions (pg. 6-94). Groundwater, however, is over-appropriated in many SEZs, including Riverside East and Amargosa Valley. Groundwater withdrawals for construction and operation at full build-out capacity far exceed the available groundwater supply in both SEZs.

For the Riverside East SEZ, the PEIS notes that further characterization of the groundwater safe yield for the Chuckwalla Valley and Palo Verde Mesa basins is necessary prior to the evaluation of impacts associated with project-specific groundwater withdrawals (pg. 9.4-77). For the Amargosa SEZ, the basin is already over allocated and groundwater withdrawals are already limited due to restrictions protecting water rights at Devils Hole. General design features state that developers will be required to conduct a detailed hydrologic study that demonstrates their clear understanding of the local surface and groundwater hydrology. We note, however, that it is currently impossible to model the extent to which groundwater pumping will affect water levels at Devils Hole and Ash Meadows National Wildlife Refuge (NWR).[27] Consequently, we think that it is highly unlikely that full build out could occur in either SEZ without significant impacts to groundwater resources and groundwater-dependent species.

[26] See internet address: http://www.energy.ca.gov/2010publications/CEC-700-2010-007/CEC-700-2010-007.PDF
[27] Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project. See internet address: http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/amargosa_farm_road3.Par.28872.File.dat/Chapter%204%20-%20Environmental%20Effects.pdf

Desert Tortoise and other Threatened and Endangered Species

EPA is particularly concerned about potential impacts to desert tortoise, which inhabit 10 SEZs, in a three-state region (California, Nevada, and Arizona). The Solar Energy Program has the potential to cause direct mortality to the species and significantly fragment its habitat. The survival and recovery of some species, such as the desert tortoise, is likely to depend on the protection of core habitat areas, as well as key linkages, necessary to maintain population connectivity. According to the PEIS, the overall impact to desert tortoise is considered moderate because of the amount of potentially suitable habitat for this species in the region.

Although the PEIS states that translocation is widely accepted as a useful strategy for the conservation of the desert tortoise, there are serious concerns associated with this practice (pg. 11.1-193). The mortality of desert tortoises translocated in the Fort Irwin Expansion project is estimated to be about 50 percent. The FWS considers translocation to be an *experimental measure* that requires additional research and monitoring based on both general and site-specific conditions. Avoidance of occupied habitats and areas important to population connectivity should be the primary approach, rather than translocation. The FWS has identified core habitat areas and corridors that are important for the survival of this species, including connectivity corridors necessary to maintain genetic flow between desert tortoise populations in the Mojave. To avoid further impacts – direct, indirect, and cumulative – to this species, solar energy development should not be permitted in these areas.

Although concepts such as habitat connectivity are discussed in the Solar PEIS, it remains unclear to what extent screening was done to ensure that habitat linkages and high-value habitat will be preserved. Areas that should be excluded from solar energy development extend beyond formally designated critical habitat to also include important habitat linking populations. In addition to desert tortoise, other species that may need special consideration include the Mojave ground squirrel, flat-tailed horned lizard, Mojave fringe-toed lizard, and bighorn desert sheep.

Recommendations:

The Final PEIS should clarify to what extent screening was done to ensure that high-value habitat, habitat linkages, and areas important to population connectivity have been preserved. Impacts to intact ecosystems should be avoided or minimized.

BLM should work closely with FWS, state fish and game agencies, and other ecosystem experts to incorporate additional exclusion criteria that will protect desert tortoise populations, habitat, and connectivity corridors necessary to maintain genetic flow between desert tortoise populations in the Mojave.

Translocation should not be presented as the standard measure to minimize impacts to desert tortoises – rather the Solar PEIS should characterize it as an *experimental* option to be employed only after all avoidance and minimization measures have been fully evaluated and implemented through reconfiguring or relocating projects.

If complete avoidance is not feasible, projects should be located at low-density sites that would necessitate the translocation of as few tortoises as possible, preferably within their home range.

BLM should ensure that adequate habitat is maintained and habitat corridors remain intact for other species at risk, including the Mojave ground squirrel, flat-tailed horned lizard, Mojave fringe-toed lizard, and bighorn desert sheep.

Design Features

Design features fall short of the identified mitigation needs and measures

On a qualitative level, the PEIS provides a good general description of direct and indirect impacts associated with solar energy development for several resources in Chapter 5 (*Impacts of Solar Energy Development and Potential Mitigation Measures).* Potential mitigation measures that could be used to avoid, eliminate, or minimize impacts from solar energy development are identified in this chapter; however, the gap between the potential mitigation measures that are identified and what BLM subsequently designated as design features is considerable, and we believe that, as written, the design features will not be sufficiently effective to minimize adverse impacts to sensitive resources in the surrounding landscape at the project level.

Language used to describe design features needs to be strengthened.

The language used to describe the design features is overly broad, and may be interpreted or applied inconsistently. The widespread use of phrases such as '*shall be avoided whenever possible*', '*avoided to the extent practicable*', and '*shall be avoided when possible*' is likely to limit the effectiveness of the proposed design features, and increases the risk that they will not be applied consistently. We encourage BLM and DOE to strengthen the language used to describe the design features by offering more stringent stipulations to developers.

In some instances, the description of design features is inconsistent among the resources addressed. For example, the design features for soil resources state that land disturbance (including crossings) in natural drainage systems and groundwater recharge zones, specifically ephemeral washes and dry lake beds, is to be avoided, and *solar facilities or components (e.g. heliostats, panels, dishes, and troughs) shall not be placed in natural drainage ways* (pg. A-41). The language used to describe the design features for water resources, however, is not as direct. It states that all structures related to the solar energy facility shall be sited in locations that *minimize impacts*…..project developers *shall plan to avoid impacts*….(*any unavoidable impacts would be minimized*) (pg. A-47). Such inconsistencies in the PEIS may result in the application of inconsistent standards when interpreting design features.

For example, a developer that utilizes parabolic trough technology could tell a BLM field office that it has sited a project in such a way as to minimize impacts, but cannot avoid certain ephemeral washes to a greater extent because parabolic trough technology requires complete

grading of the soil surface, and troughs must be situated in a set configuration that limits options to avoid washes. If the parabolic troughs were placed across ephemeral washes, would BLM agree that the developer has minimized impacts (based on that technology)? Or would BLM advise the developer that it cannot site the project in that area because it wants to place components in drainage ways? As written, the Draft PEIS could be interpreted either way. If the descriptions of design features are not clear and consistent within the PEIS, it is highly unlikely that there will be a uniform degree of compliance – between projects, between technologies, or between the BLM field offices.

Recommendations:
BLM and DOE should strengthen the language used to describe the design features by offering more stringent stipulations to developers and ensuring that the design features, as presented in the PEIS, are consistent among the resources addressed.

BLM and DOE should limit the use of qualifying phrases such as '*shall be avoided whenever possible*' and '*avoided to the extent practicable*' in the design features.

Aquatic Resources

Planning-level assessment of aquatic resources in the SEZs is needed

The Solar PEIS provides very limited information on the type and distribution of aquatic resources within the SEZs. As described in Section M.11.2.2, assessments were made using the U.S. Geological Survey (USGS) National Atlas (Atlas) and National Wetlands Inventory (NWI) maps, thereby identifying only gross aquatic features in the SEZ regions (pg. M-27). Approximately seventy percent of most watersheds are smaller systems not mapped by the Atlas or NWI due to scale. Of significant concern is the following statement in the EIS,

"*Many of the wetland and surface water features in the Southwest are washes and dry lakes that have no connection to perennial surface waters and contain water for only short periods following rainfall. Therefore, although map data indicated the presence of an intermittent surface water or wetland feature within the SEZ region, it was not considered to be aquatic habitat if hydrologic data indicated water was rarely, if ever, present.*"

Based on this statement, it appears aquatic resources were arbitrarily removed from this analysis if water was rarely present. Ephemeral and intermittent streams make up over 81% of streams in the arid and semi-arid Southwest (Arizona, California, Colorado, Nevada, New Mexico, and Utah).[28] Ephemeral washes, playas, and other aquatic resources within the desert perform a diversity of hydrologic and biogeochemical 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

[28] See Internet address: http://azriparian.org/docs/arc/publications/EphemeralStreamsReport.pdf

ecosystems and adapted to their unique conditions. The evaluation of these aquatic resources should not be discounted.

Ideally, to facilitate tiering of project-level environmental reviews to the PEIS, a jurisdictional determination (JD) would be completed for each SEZ; however, we recognize that this would be a resource-intensive undertaking. At a minimum, EPA recommends that a *planning level delineation of aquatic resources* be performed within each of the SEZs. This may not disclose all aquatic resources, but it would provide additional information on the presence of aquatic resources within the study area subject to NEPA that may be subject to federal jurisdiction under Section 404 of the Clean Water Act (CWA). A proposed project's impacts to waters subject to federal jurisdiction could result in significant degradation, as defined at 40 CRF Part 230 (Guidelines).

Recommendations:
EPA recommends that a *planning level delineation of aquatic resources* be performed within each of the SEZs. This would include the identification of aquatic resources using aerial photography, existing mapping data available, and field verification. The results of such delineations should be included in the Final PEIS.

The Final PEIS should clearly explain the circumstances under which a formal site-specific JD would be required and at what point in the project planning process it would be conducted.

The PEIS should describe information necessary to comply with CWA Section 404.

Pursuant to Section 404 of the CWA, discharge of dredged or fill material to waters of the United States (waters of the U.S., jurisdictional waters, waters) requires a Section 404 permit issued by the Corps. In order to comply with the 404(b)(1) Guidelines, the applicant must determine the *geographic extent of waters* and comprehensively evaluate a *range of alternatives* to ensure that the *"preferred"* alternative is the *Least Environmentally Damaging Practicable Alternative* (LEDPA). Identification of the LEDPA is achieved by performing an *alternatives analysis* that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives. In particular, EPA would like to clarify that the alternatives analysis that is required for a Section 404 permit differs from the alternatives analysis required under NEPA. The Section 404 alternatives analysis must include on-site and off-site alternatives, which may include private land, BLM-administered land, and/or disturbed sites. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences. Pursuant to the Guidelines, *mitigation* of project impacts begins with the *avoidance* and *minimization* of *direct, indirect,* and *cumulative impacts* to the aquatic ecosystem, followed by *compensatory measures* if a *loss of aquatic functions and/or acreage* is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to waters after the LEDPA has been determined. If a Section 404 permit is required, EPA will review the project

for compliance with the Guidelines; the burden to demonstrate compliance with the Guidelines rests with the permit applicant.

Some types of technologies may be more appropriate for areas with jurisdictional waters. For example, dish technologies and PV systems allow for greater flexibility in siting layout, as compared to parabolic trough systems, which generally require complete grading and leveling of the site and re-routing of the washes.

Recommendations:
The Final PEIS should provide a more detailed discussion of issues uniquely related to aquatic resources that will need to be addressed if waters of the United States are present at a project site.

The Final PEIS should clarify that the CWA Section 404 issues mentioned above should be addressed by projects tiered to the PEIS as early in the ROW application process as possible to ensure that these projects, as proposed, are permittable under the CWA. Completing this type of analysis initially should result in a more efficient process in the long term.

If jurisdictional waters are located on site, the Final PEIS should discuss what this means in terms of subsequent environmental documentation. For example, the Final PEIS should state that, if the developer needs a CWA Section 404 permit, a project-level EIS, rather than an EA may be required. By incorporating this information into the Final PEIS, BLM will better inform potential applicants.

Design features should apply to all aquatic resources, regardless of jurisdiction

It is unclear whether BLM will consistently apply the proposed design features to protect all aquatic resources or only those subject to CWA Section 404. EPA recommends that impacts to aquatic resources, particularly in the desert, be minimized regardless of jurisdiction. We are also concerned that the language used to describe the design features is subject to interpretation, and may be interpreted or applied differently, depending on the technology, the applicant, and the BLM field office.

For example, the general siting and design criteria in Section A.2.2.10.1 state that, "A*ll structures related to the solar energy facility shall be sited in locations that* ***minimize impacts*** *on surface water bodies, ephemeral washes, playas, and natural drainage areas (including groundwater recharge areas*" (A-46). Furthermore, "*Project developers shall* ***plan to avoid impacts*** *on existing surface water features, including streams, lakes, wetlands, floodplains, intermittent streams, playas, and ephemeral washes/drainages (****any unavoidable impacts would be minimized****) of the development and in nearby regions according to*:

- All sections of the Clean Water Act (CWA), including Sections 401, 402, and 404 addressing licensing and permitting issues;" (pg. A-47).

Based on the description in the PEIS, there are no assurances that implementation of design features will be consistently applied to renewable energy projects – unless they are subject to the provisions of CWA Section 404. Using this regulatory program, avoidance and minimization of impacts to aquatic resources to the maximum extent practicable is achieved through a rigorous alternatives analysis that evaluates onsite and offsite alternatives, renewable energy technologies, and alternative site design. It is not clear what level of protection, if any, would be afforded to waters not subject to CWA Section 404 that are, nonetheless, integral to desert ecosystems and hydrology.

For example, consider two projects that EPA reviewed last year, the Calico Solar Project (CSP) and the Imperial Valley Solar Project (IVSP) – two nearly identical projects proposed by the same applicant, utilizing the same type of technology (SunCatcher). The CSP site included 456 acres of desert streams that were not subject to jurisdiction under Section 404 of the CWA; therefore, the proposed fill of 258 acres went unchallenged. In contrast, the IVSP's 881 acres of desert streams were subject to Section 404 of the CWA, and the proposal to fill 177 acres was reduced to 38 acres through the Section 404 review process and revisions to the project scope and design.

To effectively protect and manage the desert's fragile and invaluable ecosystems, the distribution of aquatic resources on a project site – regardless of CWA jurisdictional status – should be fully disclosed by an applicant in its ROW application for renewable energy development on public lands. If BLM's approval criteria were modified to incentivize avoidance of aquatic resources, e.g. by prioritizing review of, and giving preference to, projects on sites selected for minimal presence of aquatic resources, BLM could programmatically shift important renewable energy development toward more disturbed lands with fewer natural resources conflicts.

Recommendations:

EPA recommends that the language used to describe the design features, particularly as it relates to aquatic resources, be strengthened and made compulsory for all projects, to ensure consistency and accountability in protecting aquatic resources whenever and wherever it is practicable to do so.

EPA recommends that BLM's approval criteria be modified to incentivize avoidance of aquatic resources, e.g. by prioritizing review of, and giving preference to, projects on sites selected for minimal presence of aquatic resources.

Discuss geologic flood hazard class areas

The Solar PEIS does not provide information on geologic flood hazard class areas within the proposed SEZs. Flood hazards associated with alluvial fans are particularly hard to characterize using conventional methods. Flooding on active alluvial fans may consist of high velocity, sediment laden floodwater that may follow multiple paths simultaneously; flow paths may shift position during even low or moderate flows. Flooding can also occur as broad, largely unconfined shallow flow swaths that inundate large areas. These areas should be avoided if at all

possible. Additional information on these maps can be found in the following scientific article[29] describing the flood hazard areas.

Recommendation:
EPA recommends that new geologic flood hazard class maps be prepared for those SEZs containing alluvial fans so that the areas of highest risk can be avoided if possible.

Wetland Protection – Colorado and Utah

Several SEZs in Colorado and Utah have wetlands present within the SEZ boundaries, closely surrounding the boundary, or within proposed transmission corridors (e.g., Fourmile East and Los Mogotes East SEZs). EPA is concerned that land disturbance activities may impact wetlands within the SEZs. EPA is particularly concerned regarding wetland protection in the Antonito Southeast SEZ, which contains three wetlands, including Alta Lake. This SEZ also has extensive wet meadow areas within the proposed transmission line corridor. Site specific design criteria are critical for this SEZ to protect these valuable resources from direct and indirect impacts. If unavoidable impacts are anticipated, a conceptual mitigation plan is also needed that identifies the following: (1) an assessment of the functions and values of the wetlands that would be impacted, (2) the conceptual approach on how mitigation site selection will be carried out, (3) the number of acres of proposed mitigation, and (4) a basic discussion of the type of mitigation that will take place. Note: This is a subset of the "12 elements" of the mitigation plan in the Mitigation Rule that EPA believes can be appropriately defined during the programmatic NEPA stage (40 CFR 230).

Recommendations:
The Final PEIS should describe how impacts to wetlands will be avoided during land disturbance activities. The Final PEIS should include specific design criteria for wetland protection that would be applied to all solar energy projects.

EPA recommends complete avoidance of wet meadows in the Antonio Southeast SEZ – this should be incorporated as a SEZ site-specific design feature.

Water Consumption – Clarity needed on feasibility of wet cooling - Colorado and Utah

The Draft PEIS identifies wet-cooling technologies as being infeasible in all of the Utah SEZs as well as three of four Colorado SEZs (the exception being De Tilla Gulch). It is unclear from the Draft PEIS why wet-cooling technologies incorporating water conservation measures were determined to be feasible for the De Tilla Gulch SEZ. Water resources are over-appropriated in the De Tilla Gulch area. Further, the SEZ is located within a significant groundwater recharge area for Salinas Valley aquifers. The large water requirements associated with wet-cooled technology may also have the potential to impact groundwater recharge if obtained from surface water sources.

[29] For example, see *Using Geology to Improve Flood Hazard Management on Alluvial Fans - An Example from Laughlin, Nevada,* Journal of the America Water Resources Association, Vol. 41, Issue 6, pgs. 1,431-1,447, December 2005.

EPA concurs with the assessment in the Draft PEIS that wet-cooling options would not be feasible in most Colorado and Utah SEZs. This is particularly true for those SEZs where excessive withdrawals have already resulted in lowered groundwater tables, or where subsidence associated with lowered groundwater has been observed (i.e., Escalante Valley and Milford Flats South). It is unclear whether the statement of infeasibility implies that BLM will not approve projects utilizing wet-cooling technologies, or whether it is anticipated that project proponents will not select those technologies. Given the substantial potential for environmental impacts from large water withdrawals in these SEZs, as well as the documented difficulty in obtaining water rights, the Final PEIS should clearly identify SEZs where wet-cooling technologies will not be allowed. This stipulation should be documented in the ROD.

Recommendations:
The Final PEIS should clarify whether BLM will approve projects utilizing wet-cooling technology if the SEZ-specific design features states that wet-cooling technologies are infeasible.

The Final PEIS should clearly identify SEZs where wet-cooling will not be allowed.

If wet-cooling is considered an option for the De Tilla Gulch SEZ, the Final PEIS should clearly identify the level of groundwater withdrawal that can be maintained without adversely affecting groundwater levels in the area.

Groundwater Withdrawal – Quantify groundwater withdrawal allowed in each SEZ

EPA is concerned about the long-term availability of groundwater in many SEZs, considering the quantities needed for maximum build out and the potential impacts associated pumping groundwater in these basins. Where surface water bodies are connected, including springs, lowering the water table may result in reduced flow, or could even eliminate surface flows in springs or rivers. Surface water impacts may include reduction of flow volume and duration in some seasonal water courses, as well as permanent water sources. Lowering of the water table may also cause other wells, such as those for domestic supply, to dry up and need to be drilled deeper, and may result in long term potential for subsidence. Lowering of the water table below the ability of plants to reach it can also result in significant impacts.

Recommendation:
The Final PEIS should clearly identify the quantity of groundwater withdrawal allowable in each SEZ, and describe impacts associated with lowering of the water table.

Groundwater Withdrawal in the Amargosa Valley SEZ

EPA is particularly concerned about the long-term availability of groundwater in the Amargosa Valley SEZ, given that future appropriations have already been curtailed. The SEZ is located in the Amargosa Desert Hydrographic Basin, a region that has already experienced rapid water level declines. Several springs of regional importance are located nearby in the Ash

Meadows NWR, including Devils Hole, a 40-acre detached unit of Death Valley National Park. Devils Hole provides habitat for the only naturally occurring population of the endangered Devils Hole Pupfish. Ash Meadows NWR is home to 24 species of plants and animals found nowhere else in the world (pg. 11.1-21) including 11 groundwater-dependent species that are listed under the Endangered Species Act (ESA) (pg. 11.1-179).

As noted in the PEIS, the status of water supplies has been a major concern and a focus of litigation. Consequently, the Nevada State Engineer has declared the basin as over-appropriated and has stated that new water right applications in the Amargosa Desert Basin would be denied, as would any application seeking to change an existing point of diversion closer to Devils Hole (pg. 11.1-23). Although the design features listed in the Solar PEIS call for developers to conduct hydrologic studies, it is currently not possible to model the extent to which continued groundwater pumping will impact water levels at Devils Hole and Ash Meadows NWR. Regional groundwater models indicate that groundwater levels at Devils Hole are steadily declining and may reach critical levels in the near future. Small declines in spring discharge or changes in water temperature or water chemistry resulting from groundwater withdrawals in the basin may affect threatened and endangered species at Ash Meadows NWR.

Recommendation:
Given the over-appropriation of groundwater resources and the presence of special-status species, particularly in Ash Meadows NWR, EPA recommends that BLM consider eliminating this SEZ, or restricting the amount of development in this SEZ and setting restrictions on the type of solar technology permitted, such as allowing only those technologies that consume the least amount of water, such as PV systems.

Air Quality

National Ambient Air Quality Standards (NAAQS), attainment designations, emissions data, mitigation measures, and general conformity – Arizona, California, and Nevada

The Draft PEIS includes basic information on the NAAQS, attainment designations, and emissions data. This information changes periodically, though, and data are now out-of-date for some items[30] in California, Arizona, and Nevada. Also, some of the potential air mitigation measures described in both Section 5.11 and Appendix A are not specific, given that the project locations and conditions have not been refined. Although the concept of general conformity was documented in the Draft PEIS, the document did not describe how a general conformity applicability analysis will be conducted.

[30] For example, the PEIS shows that Las Vegas, NV is situated in a "nonattainment area" for CO (pg. 4-127); however, this area is now classified as in attainment with a maintenance status. Furthermore, the PEIS shows that West Central Pinal County in Arizona is listed as "attainment" for PM2.5; however, as of 2006, this area is listed as "nonattainment" status.

Recommendations:
The Final PEIS should include current information on NAAQS,[31, 32] attainment designations,[33] nonattainment designations,[31] and emissions data[34] and indicate how BLM will ensure compliance with all applicable state and local air quality regulations.

The Final PEIS should demonstrate how BLM will ensure that applicable emissions from both the construction and operational phases of solar development projects will conform to the approved State Implementation Plans (SIPs) and not cause or contribute to violations of the NAAQS, in accordance with the final general conformity rule (see 75 FR 17254, April 5, 2010).

The Final PEIS should include a detailed description of how a general conformity applicability analysis will be conducted.

EPA recommends that all air mitigation measures be as detailed as possible in the project specific plans.

Adverse impacts to air quality – Colorado, Utah, Arizona, California, and Nevada SEZs

EPA is concerned regarding the adverse impacts to air quality modeled for the construction phase in all Utah and Colorado SEZs and one Arizona SEZ. We are particularly concerned in those cases where exceedances of the PM_{10} NAAQS are modeled at residences near to the SEZ:

- Antonito Southeast (Colorado) – 230 $\mu g/m^3$ at nearest residence;
- De Tilla Gulch (Colorado) – 200 $\mu g/m^3$ at nearest residence;
- Los Mogotes East (Colorado) – 200 $\mu g/m^3$ at nearest residence;
- Wah Wah Valley (Utah) – 353 $\mu g/m^3$ at nearest residence; and
- Brenda (Arizona) – 175 $\mu g/m^3$ at nearest residence.

We are also concerned regarding adverse impacts to Class I areas from construction in four Colorado SEZs, two California (SEZs), and four Nevada (SEZs):

- Antonito Southeast (Colorado) – 114% of the Prevention of Significant Deterioration (PSD) increment for PM_{10} at Wheeler Peak Wilderness Area (WA);
- De Tilla Gulch (Colorado) – 137% of the PSD increment for PM_{10} at Great Sand Dunes WA;
- Fourmile East (Colorado) – 427% of the PSD increment for PM_{10} at Great Sand Dunes WA;

[31] For info on NAAQSs, see internet address: http://epa.gov/air/criteria.html#1
[32] For info on NAAQAs and nonattainment designations, see internet address: http://www.epa.gov/oaqps001/greenbk/index.html
[33] For info on attainment designations, see internet address: http://www.epa.gov/region9/air/maps/index.html
[34] For info on emissions data, see internet address: http://www.epa.gov/ttnchie1/eiinformation.html and http://www.arb.ca.gov/ei/emissiondata.htm

- Los Mogotes East (Colorado) – 131% of the PSD increment for PM_{10} at Great Sand Dunes WA;
- Iron Mountain (California) – 354% of the PSD increment for PM_{10} at Joshua Tree National Park (NP);
- Riverside East (California) – 5,200% of the PSD increment for PM_{10} at Joshua Tree NP;
- Amargosa Valley (Nevada) – 314% of the PSD increment for PM_{10} at John Muir WA;
- Dry Lake (Nevada) – 180% of the PSD increment for PM_{10} at Grand Canyon NP;
- East Mormon Mountain (Nevada) – 135% of the PSD increment for PM_{10} at Zion NP; and
- Millers (Nevada) – 109% of the PSD increment for PM_{10} at John Muir WA.

We appreciate the comprehensive list of potentially applicable mitigation measures provided in Chapter 5 of the Draft PEIS, and agree that those measures, if appropriately designed and implemented, could be effective in reducing fugitive dust emissions; however, the discussion in the Utah and Colorado SEZ chapters of the Draft PEIS is insufficient to assess whether mitigation will reduce adverse impacts to acceptable levels. In Chapter 5, it is indicated that project- and location-specific Dust Abatement Plans would be prepared for all solar facilities (pg. 5-153). Given the predicted adverse impacts to residents and Class I areas, the PEIS should include Dust Mitigation Plans for individual SEZs in the PEIS.

Recommendation:
Where adverse air quality impacts have been predicted, additional information regarding Dust Mitigation Plans for individual SEZs should be included in the Final PEIS. The anticipated effectiveness for reduction of predicted impacts to health of local residents or air quality in Class I areas should also be discussed.

Fugitive dust, dust control measures, and cumulative impacts – Colorado and Utah

Fugitive dust is not listed among the significant emission sources for operations impacts in Utah or Colorado SEZs, yet the Draft PEIS indicates that re-establishment of vegetation in temporarily disturbed areas would be difficult, particularly in the arid environments of Utah SEZs. In Chapter 5, the Draft PEIS notes that areas maintained to be free of vegetation during operations will use the same dust control measures listed for the construction phase. Because re-establishment of vegetation will be difficult, EPA is concerned that the dust control measures required to protect air quality during operations in Colorado and Utah SEZs may be more extensive than currently indicated in the Draft PEIS. Water consumed for dust control throughout the life of the solar energy projects is also a concern in arid western states, where water resources are already over-appropriated.

Recommendations:
The Final PEIS should include additional discussion of soil stabilization techniques that will be used during the operations phase, including information on specific Dust Abatement Plans for operations in Colorado and Utah SEZs.

The Final PEIS should provide estimates of water consumption information for dust control during operations.

EPA is concerned regarding cumulative impacts of fugitive dust on Class I areas or more broadly across the Rocky Mountain West. As noted above, three Colorado SEZs may cause substantial PM_{10} impacts to the Great Sand Dunes WA. It is not clear from the Draft PEIS whether the possible cumulative impact of simultaneous construction in more than one of these SEZs was considered. Similarly, there may be Class I areas for which construction in one SEZ did not result in modeled adverse impacts, but, due to their proximity to multiple SEZs, may be impacted by concurrent construction in two or more. Additionally, long distance transport of fugitive dust from the Colorado Plateau or Utah Great Basin is a regional concern. Long distance transport of fugitive dust from SEZs may contribute to dust on snow events in the mountains. A recent study found that dust on snow in the Upper Colorado River Basin robs the Colorado River of about five percent of its water each year, enough to supply Los Angeles for 18 months.[35]

Recommendations:
The Final PEIS should clearly indicate the potential for cumulative impacts of solar energy development on Class I areas.

The Final PEIS should include the long distance transport of fugitive dust from SEZs and the corresponding impact of that dust on snow events in the mountains within the cumulative impact analysis.

Integration of the California DRECP and the Arizona RDEP with the Solar PEIS

The California DRECP, scheduled for completion in December 2012, is intended to advance State and federal conservation goals in the desert regions while also facilitating the timely permitting of renewable energy projects in California. The DRECP will include a strategy that identifies and maps areas for renewable energy development and areas for long-term natural resource conservation.

The Arizona RDEP is scheduled for completion in 2012 and is focused on identifying lands across Arizona that may be suitable for the development of renewable energy, with an emphasis on previously disturbed or developed lands where the impacts to sensitive resources would be minimized. The objectives of the RDEP include: 1) obtaining broad consensus on the future renewable energy footprint on federal, tribal, state, and private lands in Arizona that may inform renewable energy developers in their siting of projects throughout the state; 2) designating BLM-administered public lands for renewable energy development, with an emphasis on previously disturbed sites and areas with low resource conflicts; and 3) providing opportunities to sustainably reuse disturbed lands with renewable energy potential, recognizing the demand for renewable energy generation and potential remediation and restoration requirements.

[35] Painter et. al, "Response of Colorado River runoff to dust radiative forcing in snow," *PNAS* 2010 107 (40) 17125-17130.

For the Arizona RDEP, five conceptual alternatives have been developed, in addition to the No-Action alternative. The first alternative serves as the first screen for removing areas with sensitive resources and creates a "base map" of proposed Renewable Energy Development Areas (REDAs). The second alternative focuses on identifying lands within reasonable proximity (five miles) to designated utility corridors and existing or proposed transmission lines. The third alternative focuses on avoiding impacts to sensitive surface watersheds, protecting ground-water supply, reducing consumptive use of water, and maintaining groundwater quality. The fourth alternative focuses on keeping energy generation near the point of demand. The fifth alternative emphasizes land exchanges for the purposes of enhancing revenue and protecting resources for federal lands. The BLM intends to use the Arizona RDEP EIS to amend its land use plans across Arizona.

EPA supports both the California DRECP and the Arizona RDEP. We are concerned, however, that there may be potential conflicts between the Solar PEIS and the DRECP or the Arizona RDEP, and that these conflicts may not be recognized until after all the documents have been published.

Recommendation:
We recommend that BLM elaborate on the DRECP and the Arizona RDEP in the Final PEIS, and include up-to-date maps illustrating the current boundaries and conceptual alternatives. The Final PEIS should acknowledge that additional requirements and/or conditions may apply under the DRECP and the Arizona RDEP and could supersede those presented in the Solar PEIS.

Research and Development to develop Best Management Practices in SEZs

EPA recommends that BLM and DOE set aside some portion of each SEZ for active Research and Development (R&D) aimed at defining Best Management Practices (BMPs) appropriate to each of the four primary technologies (trough, power tower, PV, and dish). Construction of a utility-scale solar energy facility requires an extensive array of ground-disturbing activities including: vegetation clearing and grubbing, excavating of soil surfaces for foundations, footings, and trenches, as well as pile driving, drilling, and grading of soil surfaces. These activities result in significant adverse impacts on soil resources and vegetation over the project area, with complete ecosystem recovery potentially requiring more than 3,000 years (pg. 5-85).

The Science Advisors provided recommendations on avoiding, minimizing, and mitigating adverse ecological impacts while accommodating renewable energy development in appropriate areas in October 2010. This report[36] states that the ecological impacts of projects that alter surficial geology should be presumed permanent, despite any good intentions or promises to restore what came before. Arid ecosystems are strongly shaped by processes that develop over millennia that cannot be replicated by human actions. Therefore, every effort should be made to

[36] See Internet address: http://www.energy.ca.gov/2010publications/DRECP-1000-2010-008/DRECP-1000-2010-008-F.PDF

avoid and minimize any new disturbance of soil surfaces in the siting, design, construction, and maintenance of any and all project features.

Since most large-scale solar energy projects require complete grading of the project site, we continue to recommend that BLM and DOE focus on developing techniques and practices to minimize the adverse impacts of constructing large solar installations on desert ecosystems. Researchers may be able to identify opportunities for the coexistence of certain species or types of vegetation, in conjunction with solar energy development. In addition, researchers may be able to identify better ways to reestablish vegetation in each of the SEZs during the lifetime of the project, as opposed to disregarding this task until decommissioning.

Recommendations:
EPA recommends BLM and DOE set aside some portion of each SEZ for active R&D aimed at defining BMPs appropriate to each of the four primary technologies (trough, power tower, PV, and dish).

BLM and DOE should encourage developers to actively engage in research projects or to support research efforts to develop techniques and practices unique to the specific technology they utilize to minimize the adverse impacts of constructing large solar installations on desert ecosystems.

Such research should be conducted within each SEZ, and should focus on investigating whether there are alternative ways of designing and/or constructing projects such that long-term impacts to soil surfaces, vegetation, and species can be reduced. BMPs should be developed for each technology and for each specific Ecoregion.

Tribal and Cultural Resources

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. Section 106 of the NHPA requires Federal agencies to consider the effects of their actions on cultural resources, following regulations at 36 CFR 800. Under NEPA, any impacts to tribal, cultural, or other treaty resources, and possible measures to mitigate such impacts, must be discussed in the EIS. 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.

According to the PEIS, government-to-government consultation was initiated with the submission of letters to 253 Tribes, Chapters, and Bands in 2008. With the expansion of the PEIS to include the SEZs, a second letter was sent out to 316 Tribes, Chapters, and Bands in July 2009 seeking comments on the proposed action and indicating that the Section 106 consultation process would be done concurrently with the NEPA process and government-to-government

consultation requirements. As of 2010, 36 tribes had responded by letter, email, or telephone, or met with local BLM personnel (pg. K-1).

Recommendations:
BLM and DOE should discuss more explicitly how impacts to tribal or cultural resources will be avoided or mitigated, consistent with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, Section 106 of the National Historic Preservation Act, and Executive Order 13007, *Indian Sacred Sites.*

BLM and DOE should work diligently to identify the most effective ways of establishing meaningful consultation and collaboration with tribal officials to address concerns related to cultural resources.

We encourage federal officials to meet directly with tribal officials and 'walk the land' whenever possible.

DOE's Tribal Energy Program promotes tribal energy sufficiency and fosters economic development and employment on tribal lands through the use of renewable energy and energy efficiency technologies. Financial and technical assistance is offered to tribes through government-to-government partnerships sponsored by DOE. Within the six-state area, there are more than 32 million acres of tribal land, some of which are suitable for large-scale solar energy development. In addition, there are disturbed, degraded, and contaminated sites located on tribal lands. Directing development to disturbed, degraded, and contaminated areas on tribal lands would likely provide a much needed economic opportunity to those tribes, consistent with DOE's recently established Tribal Energy Office's stated mission.

Recommendation:
EPA encourages BLM and DOE to identify disturbed, degraded, and contaminated sites on tribal lands and add them to the comprehensive database of such sites.

DOE is hosting a 2-day Tribal Summit on May 4-5, 2011 in Washington DC. This Summit should provide an opportunity for meaningful dialogue between DOE and tribal nations on a broad range of energy and environmental issues. Any findings, agreements, or policies arising from this event that may be relevant to federal interactions with tribes regarding utility-scale solar energy development should be summarized in the Final PEIS.

Environmental Justice

EPA is concerned about the non-traditional approach used in Section 4.18 of the PEIS to evaluate minority and low-income populations. In Section 4.18, the minority and low-income populations are assessed on a state-wide basis for each of the six states proposed for solar energy development. The analysis of minority and low-income populations on such a large scale is not relevant to the decisions being made by BLM and DOE, as it is not refined enough to identify the potential Environmental Justice (EJ) communities living in close proximity to the proposed SEZs. Additionally, this state-wide analysis is confusing when compared to the SEZ-specific

discussions in Chapters 8-13, which identify minority and low-income populations at the block-group level. For example, the conclusions in Chapter 4 lead the reader to believe that there are no low-income populations in these states (pg. 4-185). This is misleading when compared with the SEZ-specific discussions.

The PEIS concludes numerous times that no low-income populations are present. This conclusion is drawn from the criterion that the percent poverty in an area must exceed the state average by 20%. This logic is flawed. The fact that an area does not exceed the state average by 20% does not mean that no low-income populations exist. Twenty percent above state average is too a high threshold to set for poverty, particularly in California where the cost of living is much higher than in other states. Many households in California are above the poverty line, but still considered low-income. Only approximately 3.5% of the block groups in California meet the 20 percentage-points criterion.

Recommendations:
EPA recommends that the state-wide analysis of minority and low-income populations be removed from the PEIS, as it is confusing when compared to the more specific SEZ analysis.

EPA recommends that BLM use a lower threshold to define low-income and minority populations that are meaningfully greater than the state average. In addition to minority and low-income populations, EPA recommends consideration of other community characteristics including: whether the community is linguistically isolated, the education level of residents, local political capacity, potential land use differences, and health concerns.

Impacts from solar development on the surrounding community are not well understood. The loss of agricultural jobs and land conversion may not disproportionately impact low-income or minority communities directly, but could greatly impact the character of the region. Ultimately, many low-income communities depend on low-wage agricultural jobs that could be impacted by land conversion. Measuring and analyzing the communities within a 50-mile radius around the proposed SEZ is insufficient to address the socioeconomic impacts of development. In addition, the severity of impacts may be associated with different phases of development.

Recommendation:
Because potential EJ communities have been identified in the Region of Influence for many SEZs, EPA recommends that SEZ-specific design features be added for EJ, where appropriate. For example, this includes all four SEZs in Colorado and all three SEZs in Utah.

The general design features included in Appendix A provide a useful reference in determining SEZ-specific design features for EJ. However, we note that the Socioeconomic and EJ design feature sections in Appendix A are very similar and do not appear to be sensitive to the differences between these two issues.

Recommendations:
EPA recommends that additional design features be incorporated into the Final PEIS that are sensitive to the differences between Socio-economic issues and EJ issues.

EPA also recommends that the PEIS include SEZ-specific design features for SEZs with potential EJ communities. These commitments should be identified as site-specific design features, to be implemented during project-specific NEPA.

EPA recommends that BLM commit to completing the following assessments and analyses for each proposed SEZ prior to further action on the alternatives: Social Impact Assessment, Fiscal Impact Analyses, Economic Impact Analyses, and Local Workforce Assessment (educational attainment, labor force skills, etc...). These assessments and analyses would elucidate burdens on the overall economy (regionally), local jurisdictions, and communities.

The Solar PEIS states that the economic effects of solar energy projects can be positive, but this assumption fails to consider the burdens of wide-scale energy project development. An understanding of specific communities that could be impacted and how mitigation or design features will specifically relate to these communities is important when considering proposed solar energy projects within the SEZs. Potential economic burdens also should be considered in greater detail in project-specific NEPA analysis. The PEIS suggests that disruption of housing, local government expenditures, and employment would require mitigation; however, the suggested design features (mitigation measures) fail to address housing, expenditures, or employment impacts by development. The PEIS estimates that potential impacts are likely to be small with the incorporation of design features for EJ; however, this may be a gross underestimation

Recommendation:
The Final PEIS should include additional design features addressing impacts associated with the disruption of housing, local government expenditures, and employment.

Section 10.1.19.1.10 suggests that population growth in small rural communities could lead to alcoholism, depression, suicide, social conflict, divorce, and delinquency. Appendix A, however, does not include proposed design features that address these serious impacts to the societies affected by this proposed development. While monitoring crime and mental health and effectiveness of community welfare programs is a useful post-implementation tool, it is not a mitigation strategy.

Recommendation:
The Final PEIS should describe mitigation efforts directed at issues stemming from population growth in small rural communities, including alcoholism, depression, suicide, social conflict, divorce and delinquency.

EPA recommends that consideration of potential impacts to EJ communities, and proposed design features, be more closely tied to potential impacts identified in other resource

sections of the PEIS. For example, the Final PEIS should consider how impacts on water supply could affect the cost of water services to low-income communities for drinking and irrigation water. Consideration of the asthma rate for communities in areas surrounding the proposed SEZs should also be included, as well as a discussion of how impacts to air quality could affect people with asthma and other respiratory diseases.

Recommendation:
EPA recommends that the Final PEIS examine whether there are correlations between potential impacts to EJ communities, proposed design features, and potential impacts identified in other resource sections of the PEIS, including air quality and water supply.

Recent Trends and Innovations on Technology

One recent trend evident in California is the increased use of PV systems, both small-scale and large-scale. The cost of solar panels has declined by 50 percent in the last two years and is expected to decline another 10-15% in 2011. [37] In the future, we anticipate seeing more PV projects than any other type of solar technology (parabolic trough, dish, power tower). Most recently, two SunCatcher (dish technology) projects in California that had already completed the NEPA/CEQA review process were sold to two companies that specialize in PV technology. [38] Both of the companies that bought these projects intend to utilize PV, largely abandoning dish technology.

Recent innovations in concentrated solar PV should also be evaluated within the technology section. For example, consider the Amonix 7700 Concentrated PV (CPV) Solar Power Generator,[39] developed by Amonix and NREL. According to their website and recent literature, this technology uses super-efficient cells to convert sunlight to electricity, producing 40% more electricity than traditional PV systems while using about half the acreage (1 MW per 5 acres). The modules (77 feet by 49 feet) are mounted on single pedestals and can be hauled on flatbed trucks and assembled in the field. Supposedly, these modules require no special grading or other site treatment, use no water, and may allow for the movement of wildlife below them. If this is true, the environmental impacts associated with implementing this type of technology may be less severe than other types of utility-scale technology, particularly power trough technology. In addition, the power output per unit area is comparable to that of solar troughs (1 MW/5 acres).

Recommendations:
The Final PEIS should discuss recent innovations in technology including: CPV and other new technologies, potential environmental impacts associated with these technologies, and other recent trends – including cost – associated with new and existing technologies.

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[37] See internet address: http://greenworldinvestor.com/2011/02/17/another-win-for-solar-pv-over-solar-thermal-as-tessera-sells-imperial-valley-project-to-aes/

[38] The 709 MW Imperial Valley Solar project (SunCatchers) was sold to AES Solar (PV). In addition, the 850 MW Calico project (SunCatchers) was sold to K Road Power (PV).

[39] See internet addresses: http://amonix.com/content/amonix-7700 and http://www.nrel.gov/features/20110216_low-cost_solar.html

Applicants proposing to use PV technology should also be encouraged to consider the use of two-sided PV panels, demonstrated to be cost effective at Nellis Air Force Base. Use of such panels, which utilize light reflected from the ground surface as well as direct sunlight, could reduce the acreage required to generate a given number of megawatts, compared to the use of one-sided panels.

Catellus Lands

In 2010, Senator Diane Feinstein introduced new legislation in California to establish a National Monument to preserve the Catellus lands.[40] The Catellus lands include more than 600,000 acres located between the Mojave National Preserve and Joshua Tree National Monument Park. The Catellus lands were previously donated to or purchased by the DOI for conservation, and serve as an important linkage protecting wildlife corridors and ecological processes. Senator Feinstein expressed concern that these lands might be used for solar energy development, rather than conservation and sought to preserve them through a National Monument designation. In December 2009, Senator Feinstein introduced legislation, the California Desert Protection Act of 2010, to protect these lands, but the bill was not passed in 2010. Subsequently, the bill was revised and reintroduced in January 2011 as the California Desert Protection Act of 2011.

Recommendations:
Because of significant public interest in these lands, we urge BLM to elaborate on this topic in the Final PEIS and to include a map that clearly illustrates the Catellus lands, a brief history of the situation, as well as an update on the status of the lands, with respect to pending legislation.

EPA recommends that the maps presented in the Solar PEIS clearly and accurately illustrate the current boundaries of State Parks, National Preserves, National Wildlife Refuges, National Parks, and National Monuments, including the Catellus lands.

The maps should also show existing habitat corridors and areas where threatened and endangered species may be present, especially if they are located in close proximity to the SEZs.

[40] Senator Diane Feinstein has expressed an interest in incorporating the Catellus lands into a national monument. The national monument designation would ensure that hundreds of thousands of acres between the Joshua Tree National Park and the Mojave National Preserve are protected in perpetuity. The Catellus lands were previously donated to or purchased by the Department of the Interior for conservation.