SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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August 22, 2012

Gideon Kracov
Attorney at Law
801 S. Grand Ave, 11th Fl.
Los Angeles, CA 90017

Subject: Comments on the Beacon Photovoltaic Project

Dear Mr. Kracov:

We have reviewed the July 2012 Draft Environmental Impact Report ("DEIR") for the Beacon Photovoltaic Project ("Project"). The Project proposes to build a 250-megawatt solar generation facility on approximately 3.6 square miles of land four miles north of California City in Kern County, California. Project components include:

- A photovoltaic (PV) solar power generation facility containing approximately 972,000 panels;
- 230 kilovolt overhead transmission line;
- Operations and maintenance building, parking lot, office, and sewer system; and
- Access roads (DEIR, p. 3-9).

We have reviewed the DEIR for issues associated with air quality, hydrology and water quality, and hazards and hazardous materials. The DEIR fails to adequately disclose potentially significant impacts from Project construction on workers and offsite receptors. A revised DEIR needs to be prepared to adequately disclose and analyze these impacts and provide mitigation, if necessary.

Air Quality

The Project is located in the Eastern Kern Air Pollution Control District ("EKAPCD") and the Mojave Desert Air Basin ("MDAB"). Both the EKAPCD and the MDAB are designated non-attainment for PM10 (DEIR, pp. 4.2-3, 22). Significant emissions of PM10 and its contributing sources, such as NOx, will lead

to a worsening of regional air quality. The Project's estimates of PM10 and NOx emissions need to be properly disclosed and mitigated, if necessary.

Particulate Matter Emissions from Project Construction

The Project site is located in areas that are designated non-attainment for PM10. In addition, the open lands of the Project site are a "large source of windblown dust" (Fact Sheet, p. 5). Significant emissions of PM10 from Project construction, in conjunction with the area's natural windblown dust, may result in a further degradation of regional air quality.

The Project's PM10 emissions from construction activities, prior to any mitigation, are estimated to be 18.91 tons per year (tpy) and are identified to be significant because they exceed the EKAPCD threshold of 15tpy (DEIR, p. 4.2-33). The DEIR identifies mitigation measures recommended by the EKAPCD (DEIR, pp. 4.2-29 – 4.2-32). After mitigation, PM10 emissions are estimated to be 6.47 tpy (a reduction of 66%) and are considered less than significant as they fall below the EKAPCD threshold (DEIR, p. 4.2-33). The DEIR and its supporting documents fail to provide any documentation to substantiate the 66% reduction in its estimate of PM10 emissions.

A revised DEIR must be prepared to show the efficiency of the Project's proposed mitigation measures. If these measures do not account for a 66% reduction in the Project's estimated PM10 levels, additional mitigation measures (listed below) that routinely considered in other CEQA projects should be implemented:

- All equipment shall be turned off when not in use. Engine idling of all equipment shall be minimized;
- Use of emission control devices on diesel equipment;
- Pave dirt roads within the development;
- All hauling materials should be moist while being loaded into dump trucks. All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions); and
- A wheel-washing system shall be installed and used to remove bulk material from tires and vehicle undercarriages before vehicles exit the proposed project property.[1]

Research identifies that dust from construction is a major contributor to PM10 and that PM10 exposure is associated with asthma.[2] Inhalation of PM10 can exacerbate asthma especially in children who are susceptible to higher risks from PM10 exposure.[3] A "Federal Particulate Matter (PM10) Attainment Plan" by the Mojave Desert Air Quality Management District states that asthma is one adverse health effect from exposure to PM10 and children are especially high-risk.[4]

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[1] http://www.co.kern.ca.us/planning/pdfs/eirs/northsky_jawbone/DEIR/Subsections/4.3-4.pdf
[2] http://scerpfiles.org/cont_mgt/doc_files/EH-01-2.pdf
[3] http://www.co.imperial.ca.us/airpollution/attainment%20plans/final%20ic%202009%20pm10%20sip%20document.pdf
[4] http://www.mdaqmd.ca.gov/Modules/ShowDocument.aspx?documentid=42

The Project's construction activities such as "excavation, filling, grading, and vehicle travel" will result in PM10 emissions (DEIR, p. 4.2-26). PM10 emissions from Project construction in conjunction with the site's existing windblown dust (Fact Sheet, p. 5) can result in significant impacts to workers and offsite receptors, including residences located within a half-mile of the Project site (Table 4.2-2). If the Project's estimates of PM10 are significant, mitigation measures must be included in the revised DEIR.

NOx Emissions from Project Construction

NOx can react in the atmosphere to form PM10. Because the Project is located in areas that are designated non-attainment for PM10, significant emissions of NOx can lead to a worsening or regional air quality.

The Project's NOx emissions from construction activities are estimated to be 10.59 tons per year (tpy) and are not significant as they do not exceed the Eastern Kern Air Pollution Control District ("EKAPCD") thresholds (DEIR, p. 4.2-33).

The DEIR includes a table to show construction emissions of NOx from solar projects in the Desert Region of the Mojave Desert Air Basin ("MDAB"). We have reviewed estimates of NOx emissions from construction activities and have tabulated them

We have tabulated emissions, including some identified in the DEIR, from some estimates included in the DEIR and from estimates we found from other projects in the table below.

Name	County	Megawatts	Acreage	NOx Emissions (tons per year)
Beacon Solar	Kern	250	2300	10.59
Rosamond Solar[5]	Kern	155	1177	18
Catalina[6]	Kern	150	1100	64.51
Solar Gen 2[7]	Imperial	200	2009	146.14
Cluster I Solar[8]	Imperial	275	1738	64.65
Campo Verde[9]	Imperial	140	1990	23.79

The table shows estimates of NOx construction emissions vary from the low of 10.59 tons per year – the estimate for the Project – to a high of more than 146 tons per year. No rationale is provided in the DEIR for why estimates of NOx emissions from Project construction are so low in comparison to comparably sized projects. For example, NOx estimates for a similar sized project (Solar Gen 2) are nearly 14 times

[5] http://www.co.kern.ca.us/planning/pdfs/eirs/recurrent_desert/Appendix_C-Air_Quality_and_GHG_Report.pdf
[6] http://www.edf-re.com/files/uploads/Catalina_Profile_8-2012.pdf
[7] ftp://ftp.co.imperial.ca.us/icpds/eir/solar-gen-2-solar-array/07air-quality.pdf
[8] ftp://ftp.co.imperial.ca.us/icpds/eir/cluster-i-solar/08ch3-air-quality.pdf
[9] ftp://ftp.co.imperial.ca.us/icpds/eir/campo-verde-solar/05project-description.pdf

greater than the Project's estimates of NOx. No documentation of how the NOx estimate was made is included in the DEIR or any of its supporting documents.

A revised DEIR must be prepared to provide modeling calculations of Project NOx emissions, to include the methodology, model inputs, and any assumptions that were used. Gaseous particles such as NOx can react in the atmosphere to form PM10.[10,11] Because the EKAPCD and the MDAB are both designated non-attainment for PM10, significant emissions of NOx can lead to a further degradation of regional air quality. NOx emissions can also react to produce ground-level ozone.[12] Exposure to NOx emissions and its products (ozone and PM10) can lead to the airway inflammation and can cause or exacerbate conditions such as emphysema and bronchitis.[13]

If the revised results exceed the Kern County threshold of 25 tons per year, appropriate mitigation measures must be identified in the DEIR, to include:

- A plan to demonstrate that heavy-duty (50 horsepower or more) off-road vehicles to be used in the construction project will achieve a project wide fleet-average 20% NOX reduction and 45% particulate reduction compared to the most recent California Air Resources Board fleet average;
- Limiting emissions from all off-road diesel powered equipment to a maximum of 40% opacity (the degree to which light is obscured) for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or 2 on the Ringelmann smoke chart) shall be repaired immediately; and
- Minimizing drop heights when loaders dump soil into trucks.

A DEIR must be prepared to include revised calculations of the Project's NOx emissions. Mitigation measures, if necessary, should be included to ensure the health of construction workers and offsite receptors (especially children at the nearby Red Rock Elementary School).

Hydrology and Water Quality

Potential Releases of Cadmium

PV panels containing cadmium telluride (CdTe) are being considered as a possible technology for the Project (DEIR, p. 4.9-6). The DEIR dismisses any impacts these panels may have and instead states

> it has been demonstrated that there are no cadmium emissions to air, water, or soil during standard operation of CdTe PV systems. CdTe releases are unlikely to occur during accidental breakage (DEIR, p. 4.7-4).

This is in contrast with recent research that shows that cadmium from broken panels can leach into the environment. A 2011 study found that cadmium, from broken panels, can leach into groundwater at

[10] http://www.fhwa.dot.gov/resourcecenter/teams/airquality/brochure/particulatebrochure.pdf
[11] http://www.epa.gov/captrade/documents/power.pdf
[12] *Ibid.*
[13] http://www.epa.gov/air/nitrogenoxides/health.html

concentrations that exceed Environmental Screening Levels[14], which have been established for "protection against leaching and subsequent impacts to groundwater".[15]

The DEIR does not consider the possibility of panel breakage and subsequent CdTe releases due to flooding. Broken panels can expose the CdTe that is locked inside which can wash into adjacent waterways. The Project drains to the Koehn Dry Lake (DEIR, p. 4.8-1) located five miles east. Panels that break during flooding may release CdTe, at concentrations exceeding ESLs, which will be carried in the water to the Koehn Dry Lake.

Panels may break during flooding as seen in the recent flooding that occurred at the Genesis Solar Energy Project site, which is currently under construction in Riverside County. The flood, which occurred on July 30 and July 31, 2012, resulted from 6 inches of rain over the 2-day period[16], corresponding to a 500-year storm event.[17] The rainfall, which was paired with high winds, damaged almost 200 parabolic trough mirrors resulting in damages of $3 million.

Panels may also break in the event of surface rupture along the Garlock fault, located on the Project site (DEIR, p. 4.5-6). The Garlock fault is mapped as an Alquist-Priolo (A-P) Fault Zones on the basis of fault rupture has been documented in the last 11,000 years and where future rupture is considered likely.[18] Rupture of the Garlock fault may result in panel breakage and release of CdTe to the environment. If coupled with a rainfall event, significant amounts of cadmium may flow to waterways, which flow to Koehn Dry Lake, creating potential ecological risks for aquatic organisms.

PV panels containing CdTe, if used for the project, would likely break during an earthquake or if a similar storm of the magnitude that occurred at the Genesis Solar Project were to occur on the Project site. Potentially significant releases of CdTe into waterways could result, leading to toxic concentrations of cadmium in the Kohn Dry Lake and other waterways. If the Applicant decides to use CdTe panels for the Project, impacts from panel breakage that may occur due to flooding and earthquakes and any subsequent releases of CdTe must be disclosed, evaluated, and mitigated.

Project may Violate Water Quality Standards and Waste Discharge Requirements

Treatment of groundwater that will be pumped to provide 15 acre-feet of water per year for PV panel washing is not discussed. Treatment of water used for PV panel washing is often necessary at other solar projects to reduce mineral content.[19] At other solar project sites, the treatment requires discharge of wastewater to evaporation ponds which are subject to a Report of Waste Discharge and issuance of a Waste Discharge Requirement permit by the Regional Water Quality Control Board (RWQCB); in fact, a

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[14] Fate and Transport Evaluations of Potential Leaching Risks from Cadmium Telluride Photovoltaics (2012). Environmental Toxicology and Chemistry, Vol. 31, No. 7

[15] Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. http://www.swrcb.ca.gov/sanfranciscobay/water_issues/available_documents/ESL_May_2008.pdf

[16] http://www.earthtechling.com/2012/08/big-desert-solar-project-hit-by-wind-flood/

[17] http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca

[18] http://www.conservation.ca.gov/cgs/rghm/ap/Pages/main.aspx

[19] McCoy Solar Energy Project. Draft Plan Amendment and Environmental Impact Statement. Chapter 2 Proposed Action and Alternatives. May 2012. p. 2-19

Draft Report of Waste Discharge was submitted in 2009 to the RWQCB for a previous incarnation of the Beacon Solar Project for wastewater discharge.[20] Evaluation of permit requirements is necessary to ensure full compliance with the requirements of the Porter-Cologne Water Quality Control Act and the California Water Code.

The DEIR and supporting documents provide no discussion of the need to treat water used for PV panel washing and the need to evaporation ponds to treat wastewater. A revised DEIR should be prepared to identify needs for water treatment to include a Draft Report of Waste Discharge to identify potential impacts to water resources from wastewater discharge.

A Report of Waste Discharge may also be needed for any fill placement with jurisdictional Waters of the State. The DEIR states that Pine Tree Wash will be avoided during road construction except for three crossings, concluding the "impact will be minimal from these crossings and will comply with all pertinent regulations" (DEIR, p. 4.8-12). However, the DEIR does not include an analysis of the specific need for a Report of Waste Discharge and Waste Discharge Requirements for the placement of the crossings.

The DEIR states that panels or structures within high-flow areas as determined in the hydrology study for the 100-year event will be avoided (p. 4.8-12) but does not identify where other panels will necessarily be placed within channels of jurisdictional Waters of the State, thus triggering the need for a Report of Waste Discharge and Waste Discharge Requirements. The placement of fill across ephemeral drainages considered Waters of the State has led to the preparation of Reports of Waste Discharge for other solar projects. For example, in San Luis Obispo County, the Central Coast RWQCB required a ROWD and issued Waste Discharge Requirements in 2012 for the California Valley Solar Ranch project.[21] The Waste Discharge Requirements for the California Valley Solar Ranch project were based on the finding that construction would impact only 0.02 acres of ephemeral drainages.

Pursuant to Section 13260(a) of the California Water Code, a revised DEIR should be prepared to include a ROWD that would identify the project's impacts to jurisdictional waters from construction of roads or placement of PV panel supports in waterways.

Hazards and Hazardous Materials

Baseline Soil Conditions at the Project Site are not Disclosed

Past uses of and soil conditions at the Project site are not adequately described. The Project site is located on lands formerly used for agricultural operations (DEIR, 4.7-4). The DEIR generally states that pesticide usage on the site was likely due to its land use history, but does not provide any specifics on the Project's land use history except to say the "type, concentration, and frequency of this is use is unknown (*Ibid.*). The DEIR concludes by stating that residual concentrations of pesticides may be present in near surface soils (*Ibid.*).

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[20] Attachment 6, Report of Waste Discharge, Beacon Solar Energy Project. June 2009.

[21] California Regional Water Quality Control Board Central Coast Region. Individual Waste Discharge Requirements Order No. R3-2012-0006 for California Valley Solar Ranch Discharges of Fill Material for Waters of the State, San Louis Obispo County, California. February 2012.

The failure to provide any detail about pesticide use and the potential for pesticide residuals stems from the failure to prepare a Phase I Environmental Site Assessment (ESA) to be included with the DEIR. Phase I ESAs are routinely prepared to document site conditions and to identify any recognized environmental conditions.[22]

A Phase I ESA must be prepared for the Project site to evaluate past pesticide use and any potential for pesticide residuals in soil. The Project proposes to install approximately one million PV panels and associated infrastructure. Construction of these Project components will require significant earthwork including excavation, grading, filling, soil compacting, and trenching. These activities have the potential to expose construction workers to pesticides that may be present in Project site soils through dermal contact and dust inhalation. Dust containing residual concentrations of pesticides may also be transported by wind and affect offsite receptors (in particular, nearby residents).

The Center on Race, Poverty, and the Environment states that "exposure to pesticides can both cause asthma and aggravate it".[23] The "Strategic Plan for Asthma in California 2008-2012" prepared by the California Department of Health identifies pesticides as a specific asthma trigger.[24]

Construction of the Project will generate dust that may contain pesticides that are harmful to human health. Because exposure to pesticides has been established as an asthma trigger, there is the potential that Project construction may result in a significant impact to workers and offsite receptors, especially children who may live in nearby houses.

The potential for pesticides and their impacts cannot be adequately assessed without a Phase I ESA. A revised DEIR should be prepared to include a Phase I ESA to document recent and past agricultural activities on the Project site, use and types of any pesticides in those activities, and the identification of any pesticide mixing or loading areas. If pesticide use is confirmed in the Phase I ESA and identified as a REC,[25] soil sampling under a Phase II ESA must be conducted. Results should be compared to screening levels (such as environmental screening levels, regional screening levels, and human health screening levels)[26] and mitigation must be provided, if necessary.

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[22] A REC is defined as the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. *See*: http://www.astm.org/Standards/E1527.htm

[23] Center on Race, Poverty, and the Environment. The Pesticide Campaign. http://www.crpe-ej.org/crpe/index.php/campaigns/pesticides

[24] California Department of Public Health. Strategic Plan for Asthma in California 2008-2012. February 2008. http://www.cdph.ca.gov/programs/caphi/Documents/AsthmaStrategicPlan.5-5-08.pdf, p. 22

[25] A REC is defined as the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

[26] [26] California Human Health Screening Levels: http://www.calepa.ca.gov/brownfields/documents/2005/CHHSLsGuide.pdf;

Sincerely,

Uma Bhandaram

Matt Hagemann, P.G., C.Hg.

Environmental Screening Levels:
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/available_documents/ESL_May_2008.pdf; and
Regional Screening Levels: http://www.epa.gov/region9/superfund/prg/

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Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
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Investigation and Remediation Strategies
Litigation Support and Testifying Expert

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – present;
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 – 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Partner, SWAPE:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the dischrge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

<u>Policy:</u>

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt currently teaches Physical Geology (lecture and lab) to students at Golden West College in Huntington Beach, California.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and Hagemann, M., 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

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Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.

Comments

Beacon Solar
Draft Environmental Impact Report

August 21, 2012

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Beacon Solar
Draft Environmental Impact Report

Comments

These comments on the Beacon Solar Draft Environmental Impact Report (DEIR) are in two parts. Part one has topics that, I think, should be addressed in the DEIR to better inform decisions about the large and growing use of land for photovoltaic facilities; part two is a discussion of a proposed mitigation measure that needs adjustments.[1]

1.0 Topics not discussed – cumulative impacts of land use changes on structures

The Beacon Solar Project (Beacon) is not the first and may not be the last photovoltaic (PV) project proposed in Kern County. PV projects require few workers per acre. As land use for PV projects expands, there is a prospect that this will put downward pressure on local employment and labor earnings resulting in disinvestment in structures. Taken together the PV projects -- unless mitigated -- may lead to downward spirals in the value of existing structures and deterioration.

1.1 Introduction

Beacon is a utility scale PV project with an expected output of two hundred fifty megawatts (MW).[2] Beacon Solar LLC has proposed this project.[3] It plans to enter into a power purchase agreement with a commercial supplier of electricity to buy the power produced at the site; and, expects the useful life of the equipment to be thirty-five years. The equipment may be replaced at the end of its useful life and the site would continue to operate.[4]

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[1] Although the Law firm of Gideon Kracov asked me to comment on the DEIR, these comments reflect my opinions and are not the firm's opinions or the opinions of its clients.

[2] A megawatt is equal to one million (10^6) watts.

[3] DEIR Cover letter, July 10, 2012, from Jaymie Bauer, Kern County Planning and Development Department; Beacon Solar LLC is wholly owned by FPL energy, which is ultimately owned by Next Era Energy Inc.

[4] See Section 3.5

The site is located in a rural, high desert area of eastern Kern County near the places of California City, Mojave and Cantil/Rancho.[5] The existing land use zoning designation for the site is exclusive agriculture and limited agriculture.[6] The California Department of Conservation classifies the site as 'Other Land'.

The DEIR discloses that the project will be built on two thousand two hundred ninety-eight acres. The land has been out of agricultural production for about twenty-five years. This project -- if approved and if it is a business success -- will use this land permanently.

1.2 PV's Cumulative Impact on Structures

Beacon is not the first and may not be the last PV project proposed in Kern County. Solar projects other than Beacon (identified in DEIR in Sections 3.0 and 4.9) will consume, permanently, over thirty-one thousand acres (about fifty square miles).

Land is a traditional economic input and these are large changes in its use. The changes signal that an economic change is underway in the local economy. This economic change is being driven by the PV projects. They are foreclosing, perhaps permanently, employment and earning opportunities from certain (e.g., agricultural) uses of land.[7]

Although no cumulative effect of these changes is at hand, it is a fair to say that taken together the PV projects will test the strength of several local markets to adjust to the foreclosed opportunities -- initially for labor and then for commercial and residential structures.[8]

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[5] See DEIR Cover letter, July 10, 2012, from Jaymie Bauer, Kern County Planning and Development Department.

[6] See Project Description in the DEIR Notice of Availability.

[7] As is well established, when there are important uses that are external to the market (i.e. plants and animals) and cannot bid the land's use away from PV users, then, market prices will be insufficient to assure that the land is being used efficiently.

[8] There is a continual flow of workers through labor markets. The average duration of a job is three to five years. Equivalently, one-third to one half of the labor force is searching for a job. The composition of this flow while mostly young and unskilled workers does have a component of experienced workers searching for jobs and older workers returning to the labor force for a variety of reasons (for example: no longer raising children; reentering labor force after schooling; after caring for family

These adjustments will take different forms including out migration from the local area for labor and deterioration of structures (both commercial and residential) within the local area.

PV projects require few workers per acre. An expanding use of land for PV projects -- from Beacon and when coupled with past and probable future losses of acreage for other PV projects -- has the potential to put downward pressure on local employment and labor earnings (including agricultural income and employment). Unlike labor, which can move to another location, structures -- both residential and commercial -- are immobile. Structures, if left vacant or not maintained, will deteriorate.

Workers searching in a stagnating labor market will find that it will take longer to find new work and finding new work may involve leaving the area. This will bring about declines in local income. While declines in income may be met with variety of responses, income reductions generally result in reductions in spending and draw downs of savings. The reduction in spending may take many forms including but not limited to: reductions in home maintenance and delinquencies on mortgages. These factors may lead to deterioration of residential and commercial structures.

Although the PV projects have the potential to cause structural deterioration in the local area, mitigation measures may be able to slow or arrest the decline. To identify and design mitigation measures requires, *inter alia*, an understanding of the economic changes that are occurring to identify points of intervention. One set of measures, and there may be other sets, would apply performance standards to proposed PV projects. Another set of measures would condition use permits to achieve operating standards or be dismantled and removed. Strong, arms-length instruments would financially assure the site's decommissioning.[9]

The DEIR is a ready vehicle for this work. It could identify the cumulative changes in land use; consider the impacts on the constructed environment; determine if mitigations measures are needed; and, propose mitigation options.

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members; or, ending a period of military service). (See: *Microeconomic Foundations of Employment and Inflation Theory*, E. Phelps, et al.

[9] Financial assurances are discussed in more detail in the next section of these comments.

1.3 Land use in other PV projects

I begin with data on solar projects built or proposed within Kern County. The data is from Section 3.0 of the DEIR and from information in Notices of Preparation issued by Kern County.[10] For each project the table shows the MW claimed by the projects' designers, the total acres needed for the project; and, how many acres are needed per MW.

Kern Cty.		MW	Total Acres	AC/MW
	Antelope Valley	650	3544	5.45
	Distributed	214	1709	7.99
	Catalina (eXco) - solar portion	150	1441	9.61
	Edwards AFB	450	4000	8.89
	Fremont Valley	1000	9000	9.00
	Tenaska	100	700	7.00
	Millennium	250	1760	7.04
	Cantil	8	34	4.25
	Monte Vista	126	1040	8.25
	Desert Solar - Site 1	100	611	6.11
	Site 2 both phases	96	548	5.71
	Kingbird	40	324	8.10
	Willow Springs	160	1402	8.76
	Weldon	60	500	8.33
	Rosamond	155	1177	7.59
	Pioneer Green	35	240	6.86
		20	160	8.00
		70	320	4.57
	Old River #1	20	188	9.40
	#2	5	33	6.60
	Nautilus	18	150	8.33
	High Desert	18	154	8.56
	Sub total	3783	29510	7.80
	Beacon Solar	250	2298	9.19
	Total	4033	31808	7.89

Sources: Kern County Notice of Preparations
Kern County DEIRs for Beacon;
Distributed Project

[10] http://www.co.kern.ca.us/planning/noticeprep.asp

The data show Beacon will be an under performing PV project when measured by its consumption of land. Beacon requires more acres to make a MW than any other PV project in the area except for Old River #1 and the solar portion of Catalina (eXco).[11] In turn, this suggests that Beacon when compared to other projects is less efficient in its resource use; may contribute more to structural deterioration in the local area; and, has increased vulnerability to policy or economic changes.[12]

1.3 Land use changes, deteriorating structures and its consequences

Land is a traditional factor of production that when combined with other factors like labor can provide local earnings (e.g., agriculture). Beacon -- like other PV projects -- uses a large amount of land to employ relatively few. Beacon, however, is at an extreme in its use of land. Beacon -- relative to other PV projects -- has more potential to foreclose local earnings and employment and more potential to result in regional disinvestment in the built environment (e.g., structures) than previous PV projects. Furthermore, when viewed cumulatively, the increasing amount of land used in PV projects suggests an increase in the likelihood of disinvestment in local housing in particular and deterioration of structures generally.

A typically disinvestment process proceeds as follows. Reductions in earnings result in across the board reductions in spending including reduction in spending for maintenance of structures. Reductions in maintenance causes structures to deteriorate and their value in exchange (the market price) declines. Falling market prices for existing structures may cause the prices of some structures to fall below their outstanding mortgage amounts. Falling market prices also influence valuations of neighboring property whose value may fall below their outstanding mortgage amounts. This may lead to delinquencies and foreclosures and another round of price declines.

Sometimes declines in market prices signal would-be buyers to become active and look for bargains. This can slow a disinvestment process. This has happened in some neighborhoods in urban areas. When successful, the deteriorating of structures in some neighborhoods is slowed, halted and reversed. Reinvestment occurs. Deteriorating structures in remote locations, however, are less likely to attract bargain hunters than similar structures in urban locations. In

[11] The Rider Ridge project used more acres to make a MW but is no longer proposed.
[12] Perhaps Beacon could be reconfigured to use less land.

consequence, the disinvestment process may continue as declining structure prices induces further reductions in maintenance, which further depresses prices and induces further deferrals of maintenance.

In some urban areas the disinvestment cycles end when structure prices plus rehabilitation (undoing the effects of deferred maintenance) begin to approximate site costs plus replacement costs (i.e. demolish the deteriorated structure and build a new one).

There are two reasons why bargain hunting cannot be relied on to attenuate structural decline in areas that are not already densely settled.

First, in rural area fewer people are aware of what is occurring. Many people see urban areas decline because urban areas offer diverse employment and recreational opportunities (zoos, sporting events, entertainment). Mobility thru the area sparks interest in renewed investment.

Second, the declining neighborhoods in an urban area are sustained by a level of public services supported by a tax base from other neighborhoods.

Towns beyond the urbanized area are different. Fewer people live there and fewer people visit. They are more limited in their employment options and their recreational attractions. There is no larger unit to buffer their decline.

The relative isolation of towns and small cities may well allow them to decline in obscurity. Those who can move away, move away. Vacancies increase. Vacant homes deteriorate faster than occupied homes. The tax base and services fall and the general desirability of such areas drop. Disinvestment continues and the quality of the housing stock declines. In less urbanized areas there is no readily available larger unit to slow the decline. The decline of small cities and towns—if the past provides guidance—will be marked by household income reductions, deterioration of structures and deteriorating public services.[13]

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[13] Allowing the decline of the tax base to lead to deterioration in the quality of public services may create social outcomes that are costly to address.

This disinvestment process has been observed in urban areas during the decline and depopulation of Rust Belt cities. It is a process that started with the loss of an employment base albeit manufacturing rather than land-based activities like agriculture. It has proved difficult to reverse in an urban setting. It may be harder to reverse at outlying sites. In urban areas, density and public transit provide a basic level of mobility; remote areas have fewer employment alternatives and access requires private transit.

1.4 Conclusions on topics not adequately discussed

Beacon is one of several PV projects that are reducing the opportunity to earn labor income in the local area. Taken together the PV projects -- unless mitigated -- may lead to downward spirals in the value of existing structures. Deterioration may result.

Beacon -- in part because it consumes more land per unit of output than most other existing or proposed PV projects -- presents an opportunity to address concerns about the consequences to the fixed structural assets in the County. The DEIR should investigate and determine if the cumulative impacts from PV projects on the built environment are significant and capable of mitigation.

2.0 Comments on Impacts addressed – cumulative impacts on land use.

The previous section addressed topics that <u>are not</u> discussed in the DEIR. Specifically, whether the cumulative effect of multiple PV projects will foreclose employment and earning opportunities from certain (e.g., agricultural) uses of the land to the extent that disinvestment occurs and residential and commercial structures deteriorate.

This section addresses concerns that <u>are</u> discussed in the DEIR: cumulative impacts on land; and, a proposed mitigation measure.

2.1 Introduction

The DEIR (Section 4.9) notes that this PV project coupled with other PV projects presents risks of widespread abandonment because of business failure or obsolescence. This outcome could result from any one of a number of common causes such as changes in technology, changes in state or national energy policy, or economics. Failed or

obsolete PV facilities have no alternative use. If abandoned they would deteriorate, perhaps creating a hazard to human health and the environment.

According to the DEIR (Section 4.9), the cumulative effect of widespread project abandonment would result in significant land use impacts. To mitigate the risk of adverse land use impacts and to protect surrounding landowners, a mitigation measure -- a financially assured decommissioning plan -- is proposed.

Three observations follow. First, the existence of a decommissioning plan does not imply that Beacon's impacts will be temporary. Beacon is intended to be a permanent feature of the high desert landscape, ecology and economy. Second, the decommissioning plan applies only to Beacon; it does not apply to the other facilities that may also fail. Third, this decommissioning plan is only as effective as the financial assurances that support it.

2.2 The facility is permanent.

Although the Executive Summary (Section 1.5) states:

> At the end of the lifespan of the proposed project, the panels and all above ground equipment would be removed, restoring the visual character of the proposed project site to its pre-construction state, which would also restore potential foraging habitat for golden eagle and other raptors.

This statement is not indicating that Beacon will only last for a few years or is temporary. It is envisioned to be permanent. The loss of land for other uses (e.g., habitat, agriculture) will be permanent. The DEIR states in Section 3.5 that:

> The project proponent expects to sell the renewable energy produced by the product under the terms of a long-term Power Purchase Agreement (PPA). It is anticipated that the life of the PPA is between 20 to 25 years, while the life of the solar facility is at least 35 years. Following the expiration of a PPA for the project, the project proponent may, **at its discretion**, (emphasis added) choose to enter into a subsequent PPA, update technology and re-commission, **or** (emphasis added) decommission and remove the system and its components. The solar site could then be converted to other uses in accordance with applicable land use regulations in effect at that time.

2.2 The decommissioning plan applies only to Beacon not all projects.

The DEIR (Section 4.9-16, 17) acknowledges that there are widespread risks of abandonment from common causes such as changes in technology, energy policy, or, economics. Moreover, these common causes could influence all or most PV projects in the region. Yet, the decommissioning plan called for in this mitigation measure applies only to the Beacon facility.[14]

How the County addresses *widespread* abandonment of PV facilities is a serious question but it may be a question outside of the scope of this DEIR. Formally, widespread abandonment will either be addressed: case-by-case by requiring decommissioning plans for each PV facility;[15] broadly by developing a comprehensive response (e.g., levy a tax on all PV facilities to build a trust fund to decommission the facilities); or by ignoring widespread abandonment.

2.3 The decommissioning plan needs strong financial assurances.

Mitigation measure (MM 4.9-1) requires that a financially assured decommissioning plan be submitted to the Kern County Planning and Community Development Department prior to the issuance of a building permit. Required elements of the plan, *inter alia*, are that it be written; be kept up to date; contain a cost estimate for carrying out the tasks involved in removing the facility; and, be financially assured.

The characteristics of the financial assurance instrument the permittee must provide are important because an inadequate (perhaps worthless) financial assurance may mean inadequate (or no) mitigation.

An adequate financial assurance should:

- Attach to all transfers of site ownership;

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[14] Of course the Beacon facility might fail for reasons particular to it such as: inefficiency, poor management, unable to secure a favorable future contract, unreliability and the like. If it fails for a particular rather than a common cause the decommissioning plan could be used if there are financial resources available to implement it.

[15] Other solar projects in Kern County have mitigation measures that call for a financially assured mitigation plans. See for example Antelope Valley Solar (April 2011). Unfortunately, they have the same defects (discussed below) as the plan offered in Beacon.

- Make all responsible parties jointly liable;
- Be assured by an entity at arms length from the site owner;
- Be able to withstand any responsible party's bankruptcy;
- Be clear about what signals the start of restoration, (e.g., a date certain; output falls below a threshold);
- Be payable to an entity capable of managing the restoration; and,
- Provide in cash the purchasing power needed to restore the site.

The mitigation measure contains a 'trigger' that states:

> Should any portion of the solar field not be in operational condition for a consecutive period of twenty four (24) months that portion of the site shall be deemed abandoned and shall be removed within sixty (60) days from the date a written notice is sent to the property owner and solar field owner, as well as the project operator, by the County. Within this sixty (60) day period, the property owner, solar field owner, or project operator may provide the County a written request and justification for an extension for an additional twelve (12) months. The Kern County Planning and Community Development Director shall consider any such request at a Director's Hearing as provided for in Section 19.102.070 of the Kern County Zoning Ordinance. In no case shall a solar field, which has been deemed abandoned, be permitted to remain in place for more than forty-eight (48) months from the date the solar facility was first deemed abandoned.

Three specific comments on the mitigation measure follow.

- First, the County appears to have no power to require compliance with the mitigation measure once the building permit(s) are issued. This must be corrected.

- Second, the financial assurance instrument must be able to withstand bankruptcy and attach to all future owners of the site. I do not see how the requirement to maintain a decommissioning plan is transferred from owner to owner.

- Third, the mismatch between the time the trigger allows for appealing a compulsory decommissioning and the length of time a financial assurance instrument is in force reduces if not completely eliminates the value of this mitigation measure. This is because the mismatch may result in the County not receiving any funds.

2.3.1. How are the decommissioning plan's requirements enforced after the building permits are issued?

The mitigation measure that calls for a decommissioning plan assumes a high level of good faith cooperation among the County and Beacon's owners. Even if this trust exists today, there is no reason to believe that the same level of trust will exist tomorrow or that today's owner of the facility will be tomorrow's owner.

There is little experience with utility scale PV facilities so their useful life is a matter of conjecture. Utility scale PV facilities are likely to have an economic life that depends on many variables including but not limited to: the wholesale price of electricity; the relative efficiency of other solar installations; and, the relative efficiency of providing the services of electricity that can be self-produced by the residential and commercial sectors.[16]

The data show that thirty years is a long time in the economic life of a firm. The U.S. Department of Commerce, Center for Economic Studies tracks, *inter alia*, the life of U.S. firms.[17] For 2010, the latest year for which data has been published, the US economy consisted of five million firms with employees. These data show that there is a 17% chance that a firm will survive to the twenty-sixth year.[18,19]

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[16] Residential scale hot water heating competes with utility provided electricity, residential scale pv production competes with utility provided electricity, commercial entities are place panels on the roof to provide electricity for lighting and temperature control. This competes with utility provided electricity.

[17] See the Business Dynamics Statistics (BDS) produced by the Center for Economic Studies of the U.S. Census Bureau maintains the database of establishments with paid employees.

[18] See also the Prologue to Arie de Graus's, *The Living Company*. He reports that the life expectancy at birth of all companies is 12.5 years; multinational corporations last only 40 to 50 years; and, one third of 1970 Fortune 500 companies disappeared by 1983 (a rate consistent with a 40 year life for a Fortune 500 company).

[19] A company may cease to exist for many reasons including liquidation, acquisition, and multiple types of bankruptcy. All cessations of business jeopardize the continuation and completion of a pledge of decommissioning and removal unless there is an adequate and independent assurance instrument. The data show cessation is a common occurrence and that it is highly likely after twenty-five years.

So, even if useful life is shorter than some expect and does not exceed thirty years, thirty years is beyond the lifetime of most U.S. firms.[20] The data on firm life indicate that it is highly likely that even if the PV facility is short-lived, the County will not know the entity with whom they will be dealing even a few years from now. Accordingly, the mitigation measure must require ongoing compliance with the mitigation measure by all current and future owners.

Perhaps there are permits issued by the county -- in addition to building permits -- than can be conditioned. What the County or citizens need is the authority:

- To shut down the facility if the County does not have an approved, financially assured plan; and,

- To confiscate all revenues earned during the time the facility operated without a financially assured decommissioning plan.

Absent this authority, mitigation measure (MM 4.9-1) appears to be inadequate to mitigate the impact that it claims to address.

2.3.2 Will the financial assurance instrument be able to withstand bankruptcy? Will it attach to future owners of the site? How?

Not all financial instruments are capable of providing adequate financial assurances.

A trust fund that builds over time, for example, is by itself an inadequate assurance. An accumulating trust fund would be unable to pay for the restoration if the solar facility fails or becomes obsolete earlier than expected. So, if an accumulating trust fund is used to financially assure the restoration then it must be complemented with another instrument, such as a letter of credit, until the trust builds to an amount that can provide the purchasing power to implement the restoration plan. Finally, to withstand bankruptcy, the trust must be irrevocable. That is, the funds in the trust are never returned to Beacon's owners.

A fully funded, irrevocable trust can provide the necessary funds and can survive bankruptcy.

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[20] Title to some or all of the parcels that make up the site Beacon has proposed may, in the future, be sold to another firm.

A surety bond may be impractical. These instruments are more commonly used for a shorter term than envisioned in this instance; have not proved to be effective to assure coal mine reclamations; and place a burden on the receiver of the funds (the County) to show whether the site is ready to be restored or should be restored. In a bankruptcy petition the funds for decommissioning may be withheld at the request of creditors.

A stand-by, evergreen letter of credit is a better instrument to use to assure restoration. These instruments are in use to assure the remediation of Resource Conservation and Recovery Act sites.[21] The amount of the letter is tied to the restoration cost estimate. Typically, a letter lasts for a year. When renewed its amount may change depending on increases or decreases in the restoration cost estimate.[22] The permittee may be given the option to supplement the letter of credit by establishing an arm's length trust fund.[23] In this event the amount of the letter plus the amount of the trust must meet the engineering cost estimate for restoration.

Most importantly, a letter of credit is not the property of the owner of the PV facility and in the event of a bankruptcy is not counted as part of the property of the failing company. The County will be able to collect the funds and will be in a much stronger bargaining position about the use of the funds.

No other financial instrument is appropriate. Pledges will not withstand bankruptcy. Pledges make the County dependent upon the good will of a troubled company. Generally, instruments or statements that are not guaranteed by a third party (e.g., self insured) or not at arms length from the current operator (e.g., parent corporation) will not withstand bankruptcy.

Finally, while requiring the receiver of a building permit to submit a financially assured decommissioning plan is important, it is insufficient.

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[21] Responsible parties in RCRA cases that fail to provide financial assurances are in contempt of a court and are subject to additional fines and loss of liberty.

[22] The mitigation measure might be rewritten so that PV owners who do not renew the letter of credit would face the same penalty as owners who fail to pay property taxes.

[23] This is analogous to the post-closure liability trust fund required of operators or owners of solid waste disposal facilities.

The costs of the decommissioning plan and it assurance must attach to the site so that any and all future owners of the site have this obligation.[24]

2.3.4 The financial assurance instrument is made worthless by the proposed trigger.

The trigger outlines a process where if the facility or a portion of the facility is out of use it can be decommissioned. Yet the process it outlines may last four years. The financially assurance instruments – save for a fully-funded trust fund – are renewable, one-year instruments or in the case of an accumulating trust an instrument that requires annual payments. If a portion of the project is not being used, the issuer of the financially assurance instrument -- if it does any due diligence -- will realize that the assurance instrument will be used. If so it may simply decline to renew and no other issuer will be willing to assure the funds. In that event the County will not be receiving any financial assurance and decommissioning may not occur. This makes the mitigation measure ineffective.

I do not see a way of using this trigger with a letter of credit or surety bond. If the trigger stays as written; then, the decommissioning plan must be assured with fully-funded trust that is at arms-length from the owner and is kept up to date during the appeal.

[24] Deed restrictions or covenants, for example, might be a way.

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- Senior Economist, ICF Incorporated, 1983-85, Washington DC
- Research Director, Public Interest Economics, 1976-1983, Washington DC and San Francisco, CA
- Assistant Professor, Northern Kentucky University, 1975-76

EDUCATION:

- Ph.D., Economics, University of Cincinnati, 1975
- BA. Economics, Xavier University, 1970

EXPERIENCE

- An independent research economist with many years of experience;
- A national expert in the economic aspects of environmental enforcement and policies for municipal and industrial pollutions sources;
- Experienced in damage assessments to residential and commercial enterprises;
- Experienced in natural resource damage assessments and regional economic impact assessment; and,
- An author of groundwater management and climate change papers.

Short descriptions of selected projects follow.

ECONOMICS & FINANCE

I applied economics to many of the environmental changes of the last thirty years including:

- Estimating the ability of defendants to pay a penalty and the financial effects of penalties in enforcement cases;
- Estimating the benefits of cleaner beaches and rivers;
- Developing methods to determine the effects of water quality policies on agricultural output, employment and income;
- Developing methods to estimate the benefits of preserving groundwater quality;

- Advised on the adequacy of financial assurance mechanisms;
- Estimating expected and realized benefits of irrigation projects; and,
- Critiquing efforts to regulate effluents from several industries.

Designed and used financial after-tax, cash flow models to:

- Measure the ability to pay a penalty and the effects of penalties on financial position;
- Estimate the benefit gained by entities that violate law and regulation; and,
- Estimate the burden on the residential sector from municipal compliance with law and regulation.

Provided expert economic and litigation support services to the United States (and others) in Clean Water Act, Clean Air Act, Superfund, RCRA and groundwater quality cases.

Exxon Valdez – Estimated the employment and income effects from spending the civil settlement. The work involved characterizing the options in the restoration plan in term of input/output models.

Natural resource damage assessments

- Ohio River – valued public resource damages from spills from tugs and barges. The work combined results from Natural Resource Damage Assessment models, studies of the costs of reducing risks to drinking water, and restoration costs.
- Kailua Beach State Park – valued a three-mile beach based on recreational use and estimated the damage from wastewater treatment plant effluent. The work involved reviewing, updating and synthesizing a variety of studies that valued recreation.
- Florida Beaches – valued beach closures from pollution at several beaches. The work involved extensive use of the Natural Resource Damage Assessment models for coastal and marine environments.
- Advised environmental groups on the use of contingent valuation to value natural resource damages and commented on the Federal Register notice on the use of contingent valuation to value damage

Energy & Environment

- Conducted several analyses of U.S. energy industry to estimate current and future production in wetlands and in the artic.
- Estimated consequences of oil and gas leasing in the North Aleutian Basin.
- Estimated the cost effectiveness of technologies to control produced water discharges in wetlands,
- Estimated the impact of produced water controls on production, royalties and returns from coal bed methane production.

- Estimated the change in rates needed to pay for adopting cooling water intake controls at a nuclear power plant.
- Advised environmental groups on methods to fund the WV acid mine drainage reclamation fund.
- Design team member to size and fund the Superfund.
- Estimated onshore economic impacts of outer continental shelf oil and gas development in California
- Examined the efficiency and equity of federal leasing policies for oil and gas on public lands

Global Climate

- Estimated current and future greenhouse gas emissions by fuel, sector and region. The work involved estimating long-term energy using an economic model based on prices, income and combustion technology.
- Estimated greenhouse gas emissions by jets at altitude by region and the change in emissions from adopting advanced jet technology.
- Modeled current and future emission from the US automobile fleet under various assumptions about future fuel efficiency.
- Analyzed the benefits of substituting hydrocarbon propellants for CFC propellants in aerosol products. The results showed the same level of consumer satisfaction could be obtained without CFCs and without increasing prices.

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Tropospheric CH4/CD/NOx: The next 50 years. Coauthor with Anne M. Thompson. UNEP/USEPA International Ozone conference, 1986

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Friends of Earth v Laidlaw — Columbia SC — 11/93, DSC 3—92-1697—17

PIRG v, MEI - Newark — 1/94, DNJ 89—3193

Friends of Earth v Laidlaw — Columbia SC — 7/95, DSC 3—92—1697—17
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U.S. v. Rapanos et al. — Detroit MI — 10/2000, 94—CV—70788DT

PIRG v. Rahway — Rahway NJ — 4/2001, UNN—L—163—98

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Ohio Valley Environmental Coalition, et al. v. Apogee Coal Company LLC – Huntington WV. 8/2010, 3:07-cv-00413-RCC

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September 25, 2012

Jaymie L. Brauer
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Subject: Comments on the Final Environmental Impact Report and Response to Comments for the Beacon Photovoltaic Project, Kern County

Dear Ms. Brauer:

We submitted comments on the July 2012 Draft Environmental Impact Report (DEIR) for the Beacon Photovoltaic Project ("Project"). The County published a September 2012 Final Environmental Impact Report (FEIR) and Response to Comments ("Responses"). We find the FEIR and Responses to inadequately address our comments in failing to disclose and evaluate issues associated with air quality, hydrology, and hazards and hazardous materials. Prior to certification, the County should disclose and mitigate these issues as necessary in a recirculated FEIR.

AIR QUALITY

Particulate Matter Emissions

Our comments noted that the DEIR did not provide: (1) an adequate explanation of the Project's PM10 emissions estimate; and (2) an evaluation of potential health effects of the Project's PM10 emissions on workers, nearby residents, and schoolchildren. The FEIR does not adequately address these comments; therefore, we have the following supplemental comments.

1. Emissions Calculations:

The Responses state that the implementation of Eastern Kern Air Pollution Control District (EKAPCD) Rule 402 and its measures[1] would reduce the Project's fugitive dust, or PM10, emissions by 68%

[1] http://www.kernair.org/Rule%20Book/4%20Prohibitions/402_Fugitive_Dust.pdf

(Responses, p. 7-200). However, this is just an assumption on the part of Applicant and they, themselves, note that "Rule 402 does not provide a control efficiency for these measures" (Appendix C1, p. 1). The Responses state that the application of the control efficiency can be substantiated by the findings in the Western Regional Air Partnership's Fugitive Dust Handbook (Responses, p. 7-200). Our review of the Handbook does not reveal any evidence for this claim.

The Responses state that the control efficiency of 68% is reasonable for the Project's fugitive PM10 emissions (Responses, p. 7-202). The Applicant cannot claim this reduction in fugitive PM10 emissions as reasonable without providing any modeling results or calculations. The Applicant cannot simply list the efficiency of the mitigation measures (Responses, p. 7-201) and assume a 68% reduction in emissions. Instead, the Applicant should provide calculations to specifically show how implementation of the mitigation measures will result in a 68% reduction in fugitive PM10 emissions.

2. Health Effects of Emissions:

Our comments noted the detrimental health effects of exposure to PM10. As stated, exposure to PM10 can cause and exacerbate asthma[2], especially in children[3], as well as cause bronchitis, lung tissue damage, cancer, and even death.[4] Research identifies that dust from construction is a major contributor to PM10 and that PM10 exposure is associated with asthma.[5] A report by Imperial County, California states that PM10 inhalation can exacerbate asthma and children are susceptible to higher risks from exposure to PM10.[6]

Red Rock Elementary School is located three miles north of the Project site (DEIR, p. 4.7-1). Four residences are located within 0.5 miles of the Project boundary (DEIR, p. 4.2-2). Construction activities at the 3.6 square mile Project site -- including excavation, filling, and grading -- will result in dust generation. Dust, or PM10, generated from these activities can be transported by wind toward adjacent residences and the school. The Project site is already a "large source of windblown dust" (Fact Sheet, p. 5). The Project's emissions of PM10, in conjunction with the area's existing windblown dust, are likely to result in significant health effects to workers, residents, and schoolchildren – an impact not evaluated in the FEIR.

The FEIR should be revised and recirculated to acknowledge the adverse health effects and potentially significant impacts from exposure to dust and PM10 generated from Project construction. The Applicant should also prepare a dust control plan, routinely provided as mitigation for fugitive dust impacts in other Kern County EIRs.[7] For example, the DEIR prepared for the North Sky Wind Energy project in Kern County states that "the project proponents shall develop a Fugitive Dust Control Plan in compliance with

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[2] http://scerpfiles.org/cont_mgt/doc_files/EH-01-2.pdf

[3] http://www.co.imperial.ca.us/airpollution/attainment%20plans/final%20ic%202009%20pm10%20sip%20document.pdf

[4] http://www.epa.gov/airtrends/aqtrnd95/pm10.html and http://www.arb.ca.gov/html/brochure/pm10.htm

[5] http://scerpfiles.org/cont_mgt/doc_files/EH-01-2.pdf, p. 1

[6] http://www.co.imperial.ca.us/airpollution/attainment%20plans/final%20ic%202009%20pm10%20sip%20document.pdf, p. 1-2

[7] http://www.co.kern.ca.us/planning/pdfs/eirs/AltaEast/Body/Tables/Table%20ES-6.pdf, p. 1

East Kern County Air Pollution District Rule 402 to reduce PM10 and PM2.5 emissions during construction".[8]

The FEIR does include dust control measures as mitigation (MM 4.2-1 and MM 4.2-4). However, a dust control plan, in accordance with EKAPCD Rule 402's "Special Requirement for Large Operations"[9] must also be prepared.

The Applicant should prepare a Rule 402-compliant dust control plan to ensure that dust exposure and the potential health effects to workers, nearby residents, and schoolchildren are minimized to the maximum extent feasible. The plan should be included in a recirculated FEIR.

HYDROLOGY

PV panels containing cadmium telluride (CdTe) are being considered as a possible technology for the Project (DEIR, p. 4.9-6). Our original comments noted that the DEIR does not consider the potentially significant impacts to humans and the environment from panel breakage and subsequent release of CdTe. Catastrophic breakage of some of the 972,000 panels was not considered in the Responses. Breakage of and CdTe release from the panels on a large scale may result from earthquake shaking, flooding, or fire damage.

1. Impacts to the environment

We previously cited a study[10] that found that cadmium, from broken panels, can leach into the groundwater at concentrations exceeding Environmental Screening Levels (ESLs).[11] The Responses states that these concentrations are below human health screening levels and that health effects to on-site workers or off-site residents are highly unlikely (Responses, p. 7-203). As our comment focuses on environmental impacts to groundwater and surface water from cadmium leachate, comparison to human health screening levels is non-responsive and irrelevant. The FEIR should be revised to address and respond to our intended comment on the impacts to groundwater and surface water from cadmium leachate releases from broken panels.

The FEIR also does not address or respond to our comments on the potential for panel breakage due to flooding or earthquakes. Our original comments cited the flooding that occurred in the Genesis Solar project area and resulted in the breakage of 200 parabolic trough mirrors.[12] If a similar event were to occur on the Project site, it is reasonable to assume that panel breakage and subsequent releases of CdTe would occur, potentially resulting in impacts to groundwater and surface water. We also previously noted that the Garlock Fault is located on the Project site

[8] http://www.co.kern.ca.us/planning/pdfs/eirs/northsky_jawbone/DEIR/Subsections/4.3-4.pdf, pp. 4.3-12, 13
[9] http://www.kernair.org/Rule%20Book/4%20Prohibitions/402_Fugitive_Dust.pdf, p. 402-7
[10] Fate and Transport Evaluations of Potential Leaching Risks from Cadmium Telluride Photovoltaics (2012). Environmental Toxicology and Chemistry, Vol. 31, No. 7
[11] Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. http://www.swrcb.ca.gov/sanfranciscobay/water_issues/available_documents/ESL_May_2008.pdf
[12] http://www.earthtechling.com/2012/08/big-desert-solar-project-hit-by-wind-flood/

and panel breakage is likely to occur during an earthquake along the fault, resulting in potential CdTe release.

In the event of panel breakage (via flooding or earthquake), cadmium leachate, at concentrations exceeding ESLs, will potentially be released to groundwater and surface water, a potentially significant ecological impact. The FEIR should be revised and recirculated to disclose and thoroughly evaluate this impact.

2. Impacts to humans

The County should evaluate impacts to workers, nearby residents, and schoolchildren if CdTe panels will be used for the Project. Workers, nearby residents, and schoolchildren can be exposed to CdTe if panel breakage were to result from fire – a scenario not evaluated fully in the FEIR. The FEIR simply states that fire damage would not result in the release of CdTe (Responses, p. 7-203). This is contrast with recent research that identifies fire damage to potentially result in cadmium exposure.[13] The study states that fire can consume the PV modules and "releases cadmium from the material into the air".[14]

People can also be exposed to CdTe through inhalation of dust or ingestion of flakes and dust particles.[15] A 2009 Silicon Valley Toxics Association White Paper states that the "potential for dust and fumes creates potential hazards for workers during the preparation of materials, from the scraping and cleaning of CdTe products, and from fugitive emissions".[16]

Other CEQA documents for projects who have proposed to use CdTe technology have disclosed the potential inhalation and ingestion risks. For example, the Environmental Impact Statement (EIS) for the Ocotillo Sol solar project states that release of CdTe could occur if pitting of the panels occurred and human exposure could occur if the panels generated flake or dust particles.[17] The EIS mitigates for these potential impacts by implementing "routine monitoring and inspection activities by the Applicant to identify any potentially damaged panels. If a damaged panel is discovered, the panel would be replaced prior to any degeneration that may result in the release of CdTe."[18]

If the Applicant chooses to use CdTe panels, potential impacts to workers, nearby residents, and schoolchildren through all potential pathways of exposure (inhalation of emissions, ingestion of dust or flake particles) should be evaluated and appropriate mitigation measures, as identified in other EIRs, must be provided to ensure public health.

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[13] http://www.clca.columbia.edu/papers/Life_Cycle_Impact_Analysis_Cadmium_CdTe_Photovoltaic_production.pdf, p. 321
[14] *Ibid.*
[15] *Ibid.*
[16] http://www.greencollar.org/UserFiles/ads-media/12526955654aaa9e0d799db.pdf
[17] http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/nepa/ocotillosol.Par.49849.File.dat/Ocotillo_Sol_DEIS_Volume1_508.pdf, p. 2-11
[18] *Ibid.*

Using CdTe panels can result in potentially significant impacts from: (1) release of cadmium during earthquakes or floods to groundwater and surface water as a result of panel breakage; and (2) exposure of onsite workers, nearby residents, and schoolchildren from inhalation and ingestion of dust particles, flakes, and particulate emissions from fire damage. If the Applicant decides to use CdTe panels, these impacts should be disclosed and evaluated prior to certification of the FEIR.

HAZARDS AND HAZARDOUS WASTE

We previously stated the DEIR provided only general information on baseline soil conditions at the Project site that may be harmful to construction workers. According to the DEIR, "pesticides, herbicides, and associated metals may be present in near-surface soils at residual concentrations" (Responses, p. 4.7-4). The DEIR further stated that "older pesticides can linger in the soil for many years" (Responses, p. 4.7-4). Our comments on the DEIR noted that a Phase I Environmental Site Assessment (ESA) was not included in the DEIR to assess these potentially hazardous conditions and that without such an evaluation, construction workers might be at risk during earthwork activities.

In response, a number of Phase I ESAs, prepared in 2007 and 2008, were produced. The Phase I ESAs found no "recognized environmental conditions" to be associated with former pesticide use. Kern County concluded, in response to our comment, that "project impacts related to hazard and hazardous materials have been fully disclosed, adequately analyzed and appropriately mitigated" (Responses, p. 7-206).

We take exception with this conclusion on two counts: (1) the Phase I ESAs that were produced are more than five years old and are unreliable for decision making; and (2) failure to find pesticide use a recognized environmental condition is inconsistent with other Phase I ESA findings in Kern County.

1. Phase Is ESAs have a shelf life

The Response relies on the findings from Phase I Environmental Site Assessments (ESAs) completed in 2007 and 2008. A Phase I ESA, according to the American Society for Testing and Materials, Phase Is are valid for 180 days following acquisition of the property.[19]

Because the Phase I ESAs are dated, they are unreliable in evaluating conditions that are potentially hazardous to construction workers and future site personnel. Therefore, the FEIR's analysis of the Project site based on these Phase I ESAs is inadequate. An FEIR should be recirculated to include a new Phase I ESA that evaluates current Project site conditions.

2. Failure to find a recognized environmental condition

The finding in the Phase I ESAs that potential pesticide residues were not a recognized environmental condition is contrary to findings made in other Kern County Phase I ESAs where

[19] http://www.astm.org/Standards/E2247.htm

agricultural use was noted.[20] In the three footnoted examples, agricultural use and pesticide application were cited as recognized environmental conditions that warranted follow-up soil sampling.

The Responses state that "soil sampling pursuant to a Phase II ESA is not warranted" (p. 7-205). Contrary to this response, pesticide use in Kern County may be considered to be a recognized environmental condition, one that requires updated Phase I ESAs and soil sampling to determine health impacts. The FEIR should be recirculated to include updated Phase I ESAs and provide for soil sampling to determine if residual concentrations of pesticides are present that would present risks to construction personnel involved in earthmoving activities.

Sincerely,

Matt Hagemann, P.G., C.Hg.

Uma Bhandaram

[20] http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/8777699112/06-11892%20PH%201%20WUSD%205th%20&%20Palm%20Report.pdf, p. 14; http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/6659377872/Wegis%20ES_Phase%201_050105_Report.pdf , p. 11; http://www.ci.wasco.ca.us/Public_Documents/WascoCA_Planning/Phase%20I%20ESA.pdf, p. 15

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September 21, 2012

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Reply to Comments: Draft Environmental Impact Report of Beacon Photovoltaic Project

Dear Ms. Brauer:

Thank you for responding to my comments on the Beacon Solar project (Beacon) Draft Environmental Impact Report (DEIR).[1] I read your responses and have a few comments.

First, I address your remarks in opposition to an investigation about whether this project will exacerbate the potential for physical deterioration of existing structures. Second, I address your comparison between project size measured in megawatts and land measured in acres. Third, I accept the clarification you made as to how a decommissioning plan will attach to future owners. I note that you did not address my comments on the adequacy of financial assurances. Finally, I suggest an alternative to characterizing impacts as temporary or permanent.

1. The project and physical deterioration

The Kern County Planning and Community Development Department (The Department) in opposing an investigation of Beacon's role in the future abandonment of structures and ways to mitigate the impact says such an investigation is unsupported by case law and is speculation.

I leave it to others to comment on whether an investigation of a project's impact on physical structures is supported by case law. I disagree with your characterization of my argument as speculation. What I argued is not guesswork. It is based on theory,

[1] The responses specific to my comments are found in the document at Sections 7-J and 7-K at pages 7-193 to 7-197.

historical events and began with an observation from a NextEra report published by The Department.

NextEra Energy Resources conducted architectural resource inventories and resource evaluations. They did this to comply with existing law and regulation. A report of their findings, The Beacon Photovoltaic Solar Project Cultural Resources Report,[2] in Chapter 1 at page 1 notes that, "...there are several abandoned structures in the area ...near the site access point".

This is evidence of the area's vulnerability to vacancy, structural deterioration and abandonment. It is a fair question to ask whether this PV project will accelerate the area's existing vacancy, deterioration, and abandonment problem and to ask if there is a way to mitigate any aggravation. For example, should a trust fund be created by Beacon to acquire, repair or demolish abandoned buildings?

The argument that there are no workers displaced by the project is insufficient to exclude Beacon's contribution to structural deterioration from consideration in a DEIR. What matters is that Beacon needs no workers and that is why the structures that are in the area will face a continuing threat perhaps an increased threat of becoming vacant and falling into disrepair.

I maintain my opinion that this issue should be investigated in the DEIR and its possible mitigation should be addressed.

2. Project size measured in megawatts and acres

Using publicly available data I suggested that Beacon when compared to other projects in the area is less efficient in its use of land. The consequences are: this project is more likely to contribute to structural deterioration in the local area; and, has increased vulnerability to policy or economic changes. As a possible mitigation I suggested that perhaps Beacon could be reconfigured to use less land.

The Department responded that the Beacon site has a gulch and railroad tracks and if you remove them then Beacon scores improve. This suggestion fails to recognize that all PV projects have areas unsuitable for PV panels. It is not a fair comparison to edit out the unsuitable land from Beacon, compare it with projects that have not been adjusted for their unsuitable land and then conclude that Beacon is acceptable.

My opinion is that some PV projects are going to be more efficient than others. I used a basic measure to reveal that Beacon does not rank high on its use of land. Inefficient land use may lead to other problems. This suggests that The Department might develop performance and operating standards to help anticipate problems and develop ways to mitigate them.

3. Decommissioning plans and financial assurances

I read the DEIR to say that the plan and assurances were required to get building permits and asked how the county could enforcement the requirement for keeping the plan up to date and financially assured after the building permits were issued.

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[2] See: http://www.co.kern.ca.us/planning/pdfs/eirs/beacon_solar/Appx%20F1%20Cultural%20Resources%20Survey%20and%20Report.pdf

The Department explained that a decommissioning plan and adequate financial assurances are part of a conditional use permit. Accordingly, the requirements to keep the decommissioning plan up-to-date and adequately assured attaches to the property and thus to all future owners.

I also argued that the financial assurances as described in the DEIR were inadequate. These concerns are not addressed in your response and these concerns bear repeating.

An adequate financial assurance should:

- Attach to all transfers of site ownership; (The Department says that they do)
- Make all responsible parties jointly liable; (no response)
- Be assured by an entity at arms length from the site owner; (no response)
- Be able to withstand any responsible party's bankruptcy; (no response)
- Be clear about what signals the start of restoration, (e.g., a date certain; output falls below a threshold); (no response)
- Be payable to an entity capable of managing the restoration; (no response) and,
- Provide in cash the purchasing power needed to restore the site. (no response).

In addition there is a lengthy trigger mechanism in the proposed assurance that will make the financial assurance of little or no value.

I believe the financial assurances for decommissioning as described in the DEIR are inadequate. Even though the requirement for a plan and assurances attaches to future owners, the assurances are unlikely to provide cash to future generations to remove this installation when it is no longer needed.

4. Temporary or permanent

Opinions may vary over the meaning of temporary and permanent. To astrophysicists or geologists thirty years is an inappropriately short period of time in which to conduct an analysis, economists have been cautioned that examining too long of a period of time is a misleading guide to examining human affairs.[3] I do not think that it is useful to fence words with The Department over the difference between a permanent change and a change that lasts one or more useful lives of equipment where each life is thirty years or more.

It is, nevertheless, a tautology to say that there are no permanent impacts because the land conversion is temporary. It makes more sense to say that a project's long-term impacts end or are reduced when the land conversions are reversed. Decision makers can then judge whether it is in the public's interest to wait a long time for relief. The DEIR, however, is vague about the timing of restoration and, unfortunately, leaves that judgment solely to the permittee or it successor(s).

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[3] "... this long run is a misleading guide to examining current affairs. In the long run we are all dead, economists set themselves too easy a task, too useless a task if in the tempestuous season they can only tell us that when the storm is long past the ocean is flat again." Keynes, J.M. *A Tract on Monetary Reform*, 1923, p.80

I think a date certain for restoration should be set. Absent a date certain a process to determine the date should be defined and made a part of the conditional use permit.

Respectfully,

MKavanaugh

Michael Kavanaugh