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SUBJECT: Comments on Docket Number 09-AFC-9, "(Solar Millennium), Ridgecrest Solar Power Project"

Dear Sir:

Thank you for the opportunity to comment on the Solar Millennium project proposed for the Indian Wells Valley. I am writing to provide comments on the proposed (Solar Millennium) Ridgecrest Solar Power Project as defined by materials filed with the California Energy Commission[1] and supplemental materials provided at the 05/06 January 2010 public workshop held in Ridgecrest, CA. My concerns are cited below:

This project is proposed for location within the Indian Wells Valley. The IWV has been in overdraft for approximately 50 years and very likely meets the definition of critical overdraft[2], although this has only recently been recognized in an official way in large part through your testimony at the public workshop. The Solar Millennium project proposes 150 acre-feet per year (af/y) of water for facility operation and maintenance plus 1,500 acre-feet (af) of water during construction for the 7.5 million cubic yards of material slated for redistribution. As a point of reference, Hoover Dam only has 4.36 million cubic yards of concrete[3]! As the California Energy Commission noted in TN-54597[4], the 1,500 af of water is likely not enough and a more realistic number might be 6-8,000 af. The Indian Wells Valley Water District produces approximately 8,500 af/y. Considering this basin is in overdraft, is there even a legitimate basis of adding a significant new water consumer to the dwindling potable groundwater?

[1] http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest/documents/index.html

[2] http://www.water.ca.gov/pubs/groundwater/bulletin_118/california%27s_groundwater__bulletin_118_-_update_2003_/bulletin118-chapter6.pdf; overdraft defined starting PDF page 18, critical overdraft, page 20

[3] http://en.wikipedia.org/wiki/Hoover_Dam

[4] http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest/documents/2009-12-28_Issues_Identification_Report_TN-54597%20.pdf

Moving 7.5 million cubic yards of desert soil creates significant concern for fugitive dust which will last beyond construction into the operation phase[5]. Valley Fever (Coccidioidomycosis) spores are considered endemic to most of the Southwestern US[6] and are known to be present in Indian Wells Valley soils (via human and animal infections each year). Soil disturbance coupled with application of water (a typical dust mitigation measure) create very favorable conditions to cause activation of the spores which when inhaled can cause Valley Fever. The construction contractor probably could not afford to apply enough water to control all dust associated with this project; thus this project will probably have a negative impact to local air quality. This negative impact will add to the problems already experienced by Indian Wells Valley residents associated with Owens Lake playa dust[7]. As a result, I dispute CEC staff in the table on PDF page 2 of TN-54597 where Air Quality is claimed as a minor issue.

It is unclear from the documents provided if the applicant has given due consideration to maintaining the heat transfer fluid (HTF) above its freezing point.

> From PDF page 8 of '2.0 Project Description.pdf' "A propane-fired HTF heater will be used for freeze protection of the HTF in the solar fields. The HTF is a synthetic hydrocarbon liquid mixture of diphenyl ether and biphenyl. Similar formulations are marketed by different manufacturers under the names of Therminol or Dowtherm. The HTF is not classified as a hazardous material by the U.S. Department of Transportation, and is not listed under U.S. Environmental Protection Agency Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) regulations; however, it is regulated as a hazardous material by the State of California. It has a crystallizing (i.e., freezing) point of 12 degrees Celsius (°C) (about 54°F). Freeze protection is routinely accomplished by circulating HTF at a very low flow rate through the solar field using hot HTF from the vessel as a source. Performance model results indicate that the HTF heater may be required on very cold nights in the winter."

From data obtained from the Western Regional Climate Center[8], eight months out of the year, the mean, monthly average, overnight low temperature is below 54 °F and four months out of the year, the mean, monthly average temperature is below 54 °F from 1940 – 2009. While this is a very simplistic look at temperature variations, it strongly indicates that more than just a little supplemental fuel will be required for this project. Further, the applicant specifically uses the word propane. Interestingly, PDF page 15 of '5.13 Traffic.pdf' mentions two propane deliveries per week. A large commercial propane tanker holds 10,000 gallons[9] so two deliveries a week corresponds to 1.04 million gallons per year.

> From PDF page 12 of '2.0 Project Description.pdf', "A propane-fired HTF heater, with a rated capacity of 35 MMBtu/hr, will be provided as part of the HTF system. It is expected the HTF heater will need to operate approximately 100 hours per year to keep the HTF from freezing."

Assuming that the heater will actually have a capacity of 35 MBTU/hr (if it really is as typed, then the heater will consume the annual propane volume in less than 10 seconds) and propane has an energy density of 91,690 BTU/gallon; the burner would consume the truck deliveries in 2724.5 hours (approximately 1/3 year). Given my simple analysis above, I suspect the applicant may burn for more than 1/3 of a year and certainly will burn far more than 100 hours per year.

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[5] http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1885

[6] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC545195/?tool=pmcentrez

[7] http://geochange.er.usgs.gov/sw/impacts/geology/owens/

[8] http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4278

[9] http://en.wikipedia.org/wiki/Propane

A major capital project should stand on its own merits. This project, however, appears to cost money over time. See below:

1. Assumptions: (a) $1B capital cost, (b) financed via 30-year conventional loan with 5% interest, (c) Southern California Edison buys Solar Millennium power for $0.15/kWh, (d) Operation and Maintenance costs for a solar-only plant (does not include the propane heating for HTF) are $0.024/kWh[10], and (e) from the same Department of Energy document[10], the actual solar-only plant will operate at 29.2% of capacity (the sun doesn't shine 24 hours a day!).
2. Annual loan payments estimated at $64.4M (30 years of interest = $932.6M!).
3. Ideal case (as stated by Solar Millennium)
    a. Plant generates 500M kWh/yr = $75M/yr revenue
    b. Maintenance and Operations (MNO) costs estimated from the Kramer Junction project in a solar only mode at $0.024/kWh = $12M/yr
    c. $75M – $64M – $12M = – $1M (the plant loses $1M/yr)
4. Likely case from Kramer data
    a. Plant generates 145M kWh/yr = $21.8M/yr revenue
    b. MNO costs = $3.5M/yr
    c. $21.8M – $64.4M – $3.5M = – $46.1M (the plant hemorrhages $46M/yr)

This simple demonstration does indeed overlook many details; however, it suggests that a detailed economic analysis should be conducted before embarking on such an expensive project. It appears that a software tool already exists to help with this exact analysis[11]; perhaps this tool could be used in the next few months to verify the basic economics of the project.

I believe the California Energy Commission (CEC) has a responsibility to consider alternatives. There are other solar power generation schemes which use much less water[12] and can be installed without the massive earthmoving proposed here. SolFocus claims 38% efficiency and the Kramer plant hybrid (burning natural gas when no sun) achieves 39.6%[10]. Where in this "fast track" process will the analysis of alternatives be presented and discussed? Does the CEC process have the ability to terminate a project based on incompatibility with proposed location?

The proposed project is not compatible with the overdraft conditions that exist within the Indian Wells Valley. The project documentation available from the CEC website and via handouts at the early January workshop is alarmingly light on detail for such a massive project (1.7X more dirt moved than concrete in Hoover Dam!) and does not even appear to be self-consistent (see propane example above; there are several others). If this project is implemented as described in the Application For Certification (AFC) documents, it will have a significant negative impact to area residents and does not appear to be economically beneficial. The CEC should consider removing this project from the "fast track" process.

Sincerely,

<signed> Mark Decker

[10] http://www.docstoc.com/docs/2391482/Due-Diligence-Study-of-Parabolic-Trough-and-Power-Tower-Technologies, specifically slide 33

[11] https://www.nrel.gov/analysis/sam/

[12] http://www.solfocus.com/en/index.php and/or http://www.firstsolar.com/en/index.php Note these are given as examples only; this does not represent an endorsement of any kind.