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July 27, 2009

Via Electronic Mail and U.S. Mail

Mr. Kent Larson, Vice President
Martifer Renewables Solar Thermal LLC
12555 High Bluff Drive, Suite 100
San Diego, CA 92130

Re: San Joaquin Solar 1 and 2 Hybrid Project (08-AFC-12)
CURE Data Requests Set Three (Nos. 36 - 99)

Dear Mr. Larson:

California Unions for Reliable Energy (CURE) submits this third set of data requests to Martifer Renewables Solar Thermal LLC for the San Joaquin Solar 1 and 2 Hybrid Project, pursuant to Title 20, section 1716(b), of the California Code of Regulations. The requested information is necessary to: (1) more fully understand the project; (2) assess whether the project will be constructed and operated in compliance with all laws, ordinances, regulations and standards; (3) assess whether the project will result in significant environmental impacts; (4) assess whether the project will be constructed and operated in a safe, efficient and reliable manner; and (5) assess potential mitigation measures.

Pursuant to section 1716(f) of the Energy Commission's regulations, written responses to these requests are due within 30 days. If you are unable to provide or object to providing the requested information by the due date, you must send a written notice of your objection(s) and/or inability to respond to Commissioners Levin and Boyd and to CURE within 20 days.

Please contact us if you have any questions. Thank you for your cooperation with these requests.

Sincerely,

/s/
Tanya A. Gulesserian

TAG:bh
Enclosure

STATE OF CALIFORNIA
California Energy Commission

In the Matter of: The Application for Certification for the San Joaquin Solar 1 and 2 Hybrid Power Plant Project	Docket No. 08-AFC-12

CALIFORNIA UNIONS FOR RELIABLE ENERGY

DATA REQUESTS, SET THREE

July 27, 2009

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Attorneys for the CALIFORNIA UNIONS FOR RELIABLE ENERGY

The following data requests are submitted by California Unions for Reliable Energy. Please provide your responses as soon as possible, but no later than August 26, 2009, to each of the following people:

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Please identify the person who prepared your responses to each data request. If you have any questions concerning the meaning of any data requests, please let us know.

San Joaquin Solar ("SJS") 1 & 2

CURE Data Requests Set #3

PROJECT DESCRIPTION

Background: **BIOMASS RECEIVING, UNLOADING, HANDLING, PRE-SIZING, AND STORAGE**

The AFC project description states that biomass unloading would be conducted in a large covered building equipped with a dedicated fan and associated baghouse to control fugitive dust emissions. Biomass would be unloaded from tractor trailers with hydraulic truck lifts onto an automated conveyor system. Diesel-powered heavy equipment would move biomass on site. A "fuel aggregator" would pre-size biomass.[1] The AFC does not provide a process flow diagram for biomass handling, a schematic showing the layout of the biomass handling and storage building and associated control equipment, a description of the receiving and unloading area, *e.g.*, the use of drive-on scales to determine the quantity of wood on the tractor trailers, or technical information for the equipment that would be employed to handle and pre-size biomass, *e.g.*, the type of conveyor (bucket, belt, screw, chain/drag, oscillating, pneumatic), type of "fuel aggregator" (hammer mill, knife hog), type of screens (scalping disk oscillating, shaker deck), etc. The AFC also does not provide a description of biomass inspection for foreign materials such as metal, stone, and dirt, which must be removed before pre-sizing and combustion.

Data Requests:

36. Please provide detailed information on the mobile diesel-powered off-road equipment on site including the number and horsepower rating for each type of equipment and for each of the two biomass combustion facilities.

37. Please discuss whether the mobile diesel-powered equipment could be powered by an alternative fuel source. If an alternative fuel source is not feasible, please indicate whether all diesel-powered off-road mobile equipment would comply with the most stringent emissions standard established by the U.S. Environmental Protection Agency ("U.S. EPA") for

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[1] AFC, p. 3-7.

this type of equipment at the time of facility startup. Please indicate whether the Applicant would be willing to accept a Condition of Certification ("CoC") that it would employ only new diesel-powered equipment compliant with the most stringent applicable emissions standard established by the U.S. EPA at the time of facility startup.

Background: **BIOMASS STORAGE**

The AFC indicates that pre-sized biomass would be stored on site in a pile with approximately 14 to 28 days supply.[2] The AFC does not discuss the intermediate storage of uncomminuted biomass before further processing, the storage and handling procedures for the different sources of biomass, fuel blending activities, the effects of storage on biomass, or the potential hazards associated with storing pre-sized biomass in piles.

Depending on the source, biomass sources have different physical and chemical characteristics, which greatly influence combustion processes. Thus, fuel characteristic variations are typically mitigated by fuel blending. Further, storage of pre-sized biomass in piles can lead to dry matter losses and change in moisture content. Biological and chemical degradation and chemical oxidation processes of biomass can result in increased temperatures within the storage piles which can potentially lead to self-ignition. Further, the bacteria and fungi can rapidly grow within the biomass storage pile and potentially pose health risks. The effects are complex and depend on the particle size, moisture content, and type of the stored biomass and the size and ventilation of the storage piles.[3]

Data Requests:

38. Please provide a description of the particle size of the pre-sized biomass, the height and volume of biomass storage piles, active or passive ventilation of the storage piles, storage and handling procedures for the different types of biomass expected to be used for the Project (municipal green waste and agricultural wood waste).

39. Please indicate for how long the uncomminuted biomass would be stored on site.

40. Please indicate whether the different types of pre-sized biomass would be stored in separate piles and whether the storage piles would be covered.

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[2] AFC, p. 3-7.

[3] Sjaak Van Loo and Jaap Koppejan, Handbook of Biomass Combustion and Co-firing, Earthscan, 2008, pp. 83-85.

41. Please provide a discussion of the expected dry matter loss and moisture loss for the different types of pre-sized biomass expected to be used for the Project.

42. Please provide a discussion of the risks of self-heating and self-ignition of the biomass storage piles. Please discuss any procedures such as temperature and carbon dioxide ("CO_2") or carbon monoxide ("CO") measurements that would be implemented to monitor self-heating and prevent self-ignition of the biomass storage piles.

43. Please provide a discussion of potential health risks associated with growth of fungi and bacteria within the biomass storage piles.

Background: BIOMASS SUPPLY

The AFC states that SJS 1 & 2 are expected to utilize approximately 450,000 bone dry tons ("BDT") of biomass fuels per year in the biomass combustors with an anticipated mix of locally available fuels of 50 percent agricultural wood waste and 50 percent municipal green wastes. The AFC concludes that "with total available local supplies estimated at 2.2 million tpy [tons per year], resources to support the needs of SJS 1 & 2 are available with a very high degree of confidence."[4] This conclusion does not appear to be supported by the "Biomass Fuel Supply Review for the San Joaquin Solar 1 and 2 Projects" contained in Appendix A-4.

First, the available 2.2 million BDT per year of biomass quoted by the AFC are not "local" as the AFC suggests but rather originate within the San Joaquin Fuel Study Area (a 75-mile radius of Coalinga) *and tributary to the San Joaquin Fuel Study Area.* The tributary consists of metropolitan areas including San Francisco, San Mateo, Santa Cruz, Alameda, Contra Costa, and Sacramento counties, which are located considerably further than 75 miles from Coalinga (*e.g.*, San Francisco is located almost 200 miles from Coalinga, San José is located about 150 miles from Coalinga). The metropolitan tributary-generated biomass makes up more than 1.2 million BDT per year[5], respectively, or about 53 percent of the total estimated available biomass of 2.2 million BDT per year.[6] In other words, only about 45 percent of biomass is available "locally," *i.e.* within a 75-mile radius.

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[4] AFC, pp. 3-5 – 3-6.

[5] Biomass generated within metropolitan tributary to San Joaquin Fuel Study Area: (urban wood waste: 835,030 BDT per year) + (tree trimming material: 364,350 BDT per year) = 1,199,380 BDT per year.

[6] AFC, Appendix A-4, p. 6 and Tables 3, 4, and 6 (biomass generated within metropolitan tributary to San Joaquin Fuel Study Area: 1,199,380 BDT per year) / (total available biomass generated within and metropolitan tributary to the San Joaquin Fuel Study Area: 2,251,576 BDT per year) = 0.53.

Second, the fuel supply study estimated that about 0.14 million BDT per year, or about 6 percent of the total of available biomass of 2.2 million BDT per year, consists of cow manure,[7] which the Project does not intend to use.

Third, the fuel supply study estimates that the existing biomass facilities within the San Joaquin Fuel Study Area and tributary have a fuel demand of about 2.2 million BDT per year of which 1.3 million BDT are currently sourced within and tributary to the San Joaquin Fuel Study Area.[8] Thus, the remaining fuel availability for the Project within and tributary to the San Joaquin Fuel Study Area is approximately 0.9 million BDT per year. The "Biomass Fuel Supply Review for the San Joaquin Solar 1 and 2 Projects" (contained in Appendix A-4) concludes that "woody biomass fuel material potentially available from within and tributary to the San Joaquin Fuel Study Area amounts to approximately 947,000 BDT per year."

Fourth, more than 1.0 million BDT per year of the urban-sourced biomass within and tributary to the San Joaquin Fuel Study Area consists of urban wood waste, *i.e.* "construction/demolition wood, pallets, miscellaneous residential and commercial wood waste." Tree trimmings, *i.e.* "plant material generated from residential and commercial landscape maintenance activities" make up only about 0.4 million BDT per year within and tributary to the San Joaquin Fuel Study Area.[9] Yet, the Project proposes to utilize a fuel blend containing 50 percent "municipal green waste" (composed primarily of clippings and collected wood materials from local municipalities) corresponding to 0.225 million BDT per year, *i.e.* more than 50 percent of the available "green" waste within and tributary to the San Joaquin Fuel Study Area.

Fifth, a number of factors may reduce the availability of biofuels within the San Joaquin Fuel Study area and tributary including competing uses such as mulch, compost, landscape cover, alternative daily landfill cover, fire wood, and soil conditioners, composite panel and particle board manufacturing,[10] and the reduction in urban wood waste due to the decline in the housing market. The AFC fails to address these factors and their potential impact on fuel availability, transport distances, and fuel mix.

Further, the "Biomass Fuel Supply Review for the San Joaquin Solar 1 and 2 Projects" discusses the availability of rail ties as an alternative fuel source for the Project. The AFC does not discuss whether rail ties or other alternative fuel sources

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[7] AFC, Appendix A-4, Table 6, p. 13.

[8] AFC, Appendix A-4, Table 7, p. 15, and Table 8, p. 20.

[9] AFC, Appendix A-4, p. 7.

[10] AFC, Appendix A-4, pp. 20–22.

such as tires or municipal solid waste may be considered for the Project in the future.

Finally, the AFC claims that the San Joaquin Valley Air Pollution Control District's Rule 1403 on Open Burning, which calls for the elimination of open-field burning of orchard removal matter and other agricultural wastes, would require alternative disposal methods for these wastes for which the Project "presents a viable, profitable disposal option."[11] This statement is not supported by the "Biomass Fuel Supply Review for the San Joaquin Solar 1 and 2 Projects," which concludes that while it was anticipated that such a burn ban would provide additional fuel to biomass power plants "only a slight increase in potential orchard removal fuel volume will result."[12]

Data Requests:

44. Please indicate whether the Project would burn construction/demolition wood, pallets, or "miscellaneous residential and commercial wood waste."

45. Please discuss whether the Project may burn alternative fuels such as rail ties, tires, or municipal solid waste in the future.

46. Please document the Project's ability to secure a 50/50 mix of agricultural wood wastes and municipal green wastes (primarily composed of clippings and collected wood materials from local municipalities).

47. Please provide a discussion of alternative fuel blends and sources if the proposed 50/50 fuel mix cannot be reliably sourced.

Background: HEAT TRANSFER FLUID CIRCULATION SYSTEM

Each solar facility would include a heat transfer fluid system to transfer energy from the solar collectors and from the biomass system to the steam power cycle to generate electricity. The Project's heat transfer system would contain 185,000 gallons of heat transfer fluid within each plant's circulation system. The AFC describes the heat transfer system as including "offloading facilities, a make-up storage tank, an expansion tank, circulating pumps, and piping to and from the solar field and the biomass system. The offloading facilities, storage tank,

[11] AFC, p. 3-6.

[12] AFC, Appendix A-4, pp. 24–25.

expansion tank and circulating pumps will have secondary containment."[13] The AFC contains no further discussion of the heat transfer system design such as, *e.g.*, installation of isolation valves to minimize leaks, containment structures, the volume of the makeup storage tank and expansion tank, etc.

Data Requests:

48. Please indicate whether the Project would install isolation valves to minimize potential leaks from the heat transfer system. If isolation valves would be installed, please quantify the maximum quantity of heat transfer fluid that could potentially leak from the system between two isolation valves.

49. Please indicate the volume of the heat transfer fluid makeup storage tank and expansion tank.

Background: HEAT TRANSFER FLUID PHYSICO-CHEMICAL PROPERTIES AND POTENTIAL ENVIRONMENTAL AND HEALTH IMPACTS

The Project would use Therminol VP-1 as the heat transfer fluid. The AFC lists Therminol VP-1 as a hazardous material but does not provide any further information on the chemical composition and physico-chemical properties of this substance or a material data safety sheet.[14] The AFC does not discuss the potential degradation of heat transfer fluid over time which may require periodic replenishment or replacement. With respect to potential environmental and health impacts, the AFC concludes that without any discussion whatsoever that "potential impacts presented by the use of HTF at the facility do not appear to be significant."[15]

Data Requests:

50. Please provide a discussion of the chemical composition and physico-chemical properties of Therminol VP-1.

51. Please provide a discussion of potential environmental and health effects including the relative toxicity and hazard class and permissible exposure limit for Therminol VP-1.

52. Please provide a material safety data sheet for Therminol VP-1.

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[13] AFC, p. 5.6-20.

[14] AFC, pp. 5.15-7 – 5.15-8 and Table 5.15-7, p. 5.15-5.

[15] AFC, p. 5.15-7.

53. Please discuss the potential degradation of heat transfer fluid in the circulating system over time. Please discuss the logistics, quantities, and schedule for replenishing/replacing heat transfer fluid in the heat transfer fluid circulating system.

ALTERNATIVES

Background: ALTERNATIVE SOLAR TECHNOLOGIES

The Project would have a number of on-site diesel-powered maintenance equipment including three to four pick-up trucks, one backhoe, one tractor with a scraper blade, one water truck, one bucket truck and, one portable welder/generator.[16] The Applicant did not provide information on the horsepower, make and model, and emissions rates for this equipment. Further, it is unclear whether this equipment list is for one or both of the Project's solar/biomass facilities.

Operational emissions from diesel-powered maintenance equipment could be reduced by using gasoline-fueled light trucks and/or electric (battery-powered) vehicles, similar to those used on a golf course, to transport maintenance crew within the facility. For the heavy-duty equipment, alternative diesel blends, *e.g.*, aqueous diesel could reduce diesel particulate matter and criteria pollutant emissions.

Data Requests:

54. Please discuss the feasibility of replacing the diesel-powered maintenance equipment with alternatively powered equipment such as gasoline-fueled light trucks, alternative (e.g., aqueous) diesel blend-fueled heavy-duty equipment, and electric (battery)-powered vehicles.

[16] Applicant's Response to CEC Data Request 90.

Background: BIOMASS COMBUSTION TECHNOLOGY ALTERNATIVES

The AFC states that the Project would use fluidized bed combustion technology as an energy-efficient and environmentally favorable alternative for conversion of principally agricultural-based waste materials with a high moisture content.[17] The AFC does not provide a description or schematic of the proposed fluidized bed combustion technology. Further, while the AFC discusses alternate technologies including conventional simple cycle, integrated gasification combined cycle, coal or other solid fuel conventional furnace/boiler steam turbine, nuclear, geothermal, wind, hydroelectric, and other solar technologies,[18] it does not provide a discussion of other biomass combustion technologies, including, *e.g.*, cyclonic burners, pneumatic spreader stoker systems, thermo-chemical gasification systems, and/or pre-drying of biomass to increase the combustion efficiency.

Data Requests:

55. Please provide a description of other biomass combustion tenchnologies, including cyclonic burners, pneumatic spreader stoker systems, thermo-chemical gasification systems, and/or pre-drying of biomass to increase combustion efficiency.

Background: WET COOLING ALTERNATIVES

The Project would use wet surface air cooler ("WSAC") condensers, which combine a conventional cooling tower and turbine condenser in one unit (cell).[19] The WSAC condensers would require an annual average of 1,115 gallons per minute of makeup water, which constitutes more than 88 percent of the Project's annual average net raw water requirements of 1,262 gpm.[20,21] Considering California's severe water shortage, the AFC should have evaluated whether this water demand could be reduced by use of an alternative cooling system such an air-cooled condenser or a wet/dry hybrid system.

[17] AFC, p. 3-4.

[18] AFC, pp. 4-4 – 4-5.

[19] Applicant's Response to CEC Data Request #17.

[20] AFC, p. 5.5-12.

[21] (1,115 gpm)/(1,262 gpm) = 0.884.

Data Requests:

56. Please provide an evaluation of dry cooling alternatives including air-cooled condensers and wet/dry hybrid systems for the Project.

Background: ZLD SYSTEM AS ALTERNATIVE TO EVAPORATION PONDS

The AFC proposes to use a lined evaporation pond to dispose of the Project's wastewater streams (with the exception of the sewage which will be routed to an on-site septic system).[22] A mechanical zero liquid discharge ("ZLD") system consisting of a reverse osmosis system and/or brine concentrator and a crystallizer could potentially eliminate the need for evaporation ponds. The AFC states that "ZLD is not considered to be a highly reliable method of wastewater disposal, is not energy efficient, has high capital and operation and maintenance, and results in landfill of produced wastes. Therefore, ZLD was not selected as the preferred method of wastewater disposal."[23] The AFC does not provide a cost comparison for the proposed evaporation ponds and a ZLD system.

Data Requests:

57. Please provide a detailed cost analysis for the proposed evaporation ponds and an alternative ZLD system. Please include in the cost analysis costs for costs for disposal of the deposits in the evaporation ponds at the end of the facility life as well as potentially required mitigation for impacts on wildlife such as netting, anti-perching devices, or hazing activities to keep birds from accessing the evaporation ponds. Please document all assumptions.

Background: SEPTIC SYSTEM ALTERNATIVE

The AFC proposes to dispose of on-site generated sewage via an on-site septic tank/drainfield installation.[24] The AFC does not contain a discussion of an alternative sewage disposal, *e.g.*, piping to the City's existing or future wastewater treatment facility.

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[22] AFC, p. 5.5-13.

[23] AFC, p. 4-7.

[24] AFC, p. 5.5-13 and Appendix A-10, p. 3.

Data Requests:

58. Please indicate whether the adjacent hospital and prison facilities are connected to the City of Coalinga's wastewater treatment facility or expect to be connected in the future.

59. Please discuss the feasibility of disposing of on-site generated sewage to the City's existing or future wastewater treatment plant.

AIR QUALITY

Background: FUGITIVE DUST EMISSIONS DURING CONSTRUCTION

The AFC provides fugitive dust emissions estimates for bulldozing/earth clearing, dirt piling/material handling, wind erosion of storage piles, and vehicle travel on unpaved roads.[25] The AFC relies on a number of erroneous assumptions and fails to account for all emissions sources.

The AFC fails to account for fugitive dust emissions due to wind erosion of the graded site after grading. These emissions would occur 24 hours per day, 365 days per year after the site is graded.

The AFC calculates annual average and short-term maximum fugitive dust emissions from bulldozing/earth clearing and from dirt piling/material handling based on equations found in the South Coast Air Quality Management District ("SCAQMD") CEQA Guidelines. For these emissions estimates, the AFC assumes a soil moisture content of 15 percent for moist soil. [26] However, Project site is quite dry with annual precipitation of 8.3 inches on average.[27] Thus, for most of the year, the soil is quite dry, not moist, as assumed by the AFC's calculations. Thus, unless grading and earthmoving activities would only be conducted during the rainy season or the soil would be heavily watered before grading, a soil moisture content of 15 percent is unrealistic and results in artificially low emission factors and a considerable underestimate of fugitive dust emissions.

Further, the AFC uses an 85 percent control efficiency for bulldozing/earth moving, dirt piling/material handling, wind erosion of storage piles, and travel on

[25] AFC, Appendix B-2 "Annual Fugitive Dust Emissions" and "Short Term Fugitive Dust Emissions."

[26] AFC, Appendix B-2 "Annual Fugitive Dust Emissions" and "Short Term Fugitive Dust Emissions."

[27] AFC, p. 5.2-3.

unpaved roads by watering the site three times daily or using chemical dust suppressants allegedly based on the SCAQMD's 1993 CEQA Guidelines, Table 11-4.[28] First, chemical dust suppressants are ineffective in controlling fugitive dust emissions during grading, which removes the surface layer of the soil, and are therefore not applied prior to grading. Second, a control efficiency of 85 percent cannot be achieved by watering three times daily. The SCQAQMD's 2007 revised CEQA Handbook recommends using a 61 percent control efficiency applying water every three hours to disturbed areas within the construction site and a 69 percent control efficiency for scraper loading and unloading achieved by establishing a minimum soil moisture content of 12 percent for earthmoving by use of a moveable sprinkler system or water truck.[29] (The superseded SCAQMD's 1993 CEQA Guidelines, Table 11-4, referenced by the AFC specify control efficiencies of 30 to 65 percent for watering active sites at least twice daily, not 85 percent as assumed by the AFC.[30])

Data Requests:

60. Please discuss whether the Project site would be pre-watered before grading.

61. If the Project site would be pre-watered before grading, please provide an estimate for the amount of water needed to thoroughly pre-wet the soil for grading to achieve a moisture content of 15 percent.

62. Please revise all Project construction fugitive dust emissions estimates to reflect a realistic soil moisture content and watering or chemical dust suppression control efficiency for average and worst-case conditions. Please justify and document your choices. Please provide all assumptions and calculations used for the revised estimates as accessible (not password-protected) electronic copies of Excel spreadsheets.

63. Please revise Project construction fugitive dust emissions estimates to include fugitive dust emissions due to wind erosion of disturbed areas. Please provide all assumptions and calculations used for the revised estimates as accessible (not password-protected) electronic copies of Excel spreadsheets.

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[28] AFC, Appendix I-A.

[29] South Coast Air Quality Management District, CEQA Air Quality Handbook, Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction and Demolition, Revised April 4, 2007; http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html, accessed June 8, 2009.

[30] South Coast Air Quality Management District, CEQA Air Quality Handbook, April 1993, Table 11-4, p. 11-15.

Background: WIND EROSION OF EXPOSED SOLAR FIELDS DURING PROJECT OPERATION

The Project would include massive grading (6,200,000 cubic yards of cut and 6,200,000 cubic yards of fill[31]) and much of the graded 640-acre site would be occupied by the solar fields. Studies have shown that disturbed land such as graded areas has the highest erodibility among the inventoried land categories.[32] The Applicant does not plan to stabilize the Project site with chemical or other dust suppressants.[33] Yet, the AFC does not account for fugitive dust emissions from the graded unprotected solar fields.

Data Requests:

64. Please discuss why the Applicant deems the application of chemical dust or other dust suppressants to the graded solar fields not necessary.

65. Please revise Project operational emissions estimates to include fugitive dust emissions due to wind erosion of the solar fields. Please provide all assumptions and calculations used for the revised estimates as accessible (not password-protected) electronic copies of Excel spreadsheets.

Background: FUGITIVE DUST EMISSIONS FROM MATERIAL HANDLING

The AFC's calculations of fugitive emissions from material handling (biomass unloading and handling, limestone unloading and handling, hydrated lime unloading and handling, and fly ash handling and truck loading) are based on emission factors derived with an equation contained in the U.S. EPA's *Compilation of Air Pollutant Emission Factors* ("AP-42"), Section 13.2.4, *Aggregate Handling and Storage Piles*, and assumptions about the moisture content and quantity of the materials handled.[34] Emissions calculated according to AP-42 Section 13.2.4 are directly proportional to the usage of materials (*i.e.* weight and number of times the material is handled) and inversely proportional to the moisture content of the material handled and the wind speed. The AFC's calculations contain a number of erroneous and unsupported assumptions, which result in a considerable underestimate of fugitive dust emissions from material handling.

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[31] AFC, p. 5.3-13.

[32] Western Governors' Association, Western Regional Air Partnership's (WRAP), WRAP Fugitive Dust Handbook, September 7, 2006, p. 1-8.

[33] AFC, Appendix B-3 "San Joaquin Solar 1 & 2 Project Total Operational Emissions."

[34] AFC, Appendix B-3 "Total Project SJS 1&2, Fugitive Emissions from Material Handling."

For example, the calculation of fugitive dust emissions from biomass handling is based on the use of biomass with a moisture content of 27 percent, corresponding to the use of 100 percent of municipal green waste.[35] Because of its high moisture content, fugitive dust emissions associated with handling municipal green waste are considerably lower than those associated with handling agricultural wood waste, which according to the AFC has a typical moisture content of 11.5 percent.[36] Supply of biomass may vary seasonally and, if available, the facility at times may operate only on agricultural wood waste which has preferable combustion characteristics. Finally, as discussed above, there may be considerable moisture loss of pre-sized biomass stored in piles. Therefore, the AFC's emissions estimates based on 100 percent municipal green waste with a 27 percent moisture content considerably underestimate hourly and annual fugitive dust emissions from the biomass combustion facilities.

Second, the AFC's calculation of fugitive dust emissions from biomass handling assumes that all emissions that occur in the storage building would be moved by the dedicated fan towards the baghouse which would reduce emissions by 98 percent. Because the biomass storage building is open on both ends, this assumption is not realistic. The AFC does not contain a discussion of the capture efficiency of the fan. In addition, the AFC assumes a mean wind speed of 1 mile per hour within the biomass storage building without discussing how realistic this assumption is. Because the biomass storage building is open at both ends, depending on the wind direction, the building may at times act as a wind tunnel and wind speeds could be considerably higher.

The AFC calculates hourly and annual fugitive dust emissions from limestone, hydrated lime, and fly ash handling based on the annual average wind speed measured at the Hanford Airport from 2000 through 2004. These annual average wind speed data are appropriate for estimating annual average fugitive dust emissions, but not for estimating maximum or worst-case hourly emissions.

Further, the calculation of fugitive dust emissions from biomass handling is based on a usage of 107.9 tons of biomass per hour. The AFC does not provide a breakdown of this usage for the two biomass combustion facilities and the individual emission source activities, *e.g.,* biomass unloading from the tractor trailers onto the conveyor, pre-sizing of biomass with "fuel aggregators," conveyor drop onto a storage pile, biomass loadout from the storage pile with diesel-powered mobile equipment and drop onto conveyor to combustor. Each of these distinct source activities within the biomass handling cycle involves dropping the material onto a receiving surface and thus results in fugitive dust emissions.[37] It appears

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[35] AFC, Table 3.4-2, p. 3-6.

[36] *Ibid.*

[37] *See* AP-42, Section 13.2.4 "Aggregate Handling and Storage Piles," p. 13.2.4-3.

that the AFC incorrectly assumed that biomass (and other materials) would be handled only once.

Also, the AFC assumes a moisture content of 1 percent for limestone, lime, and fly ash. The AFC does not provide any support for these assumptions. The U.S. EPA's AP-42 Section 13.2.4 indicates that the moisture content of fly ash averages at 27 percent and the moisture content of limestone and limestone products varies from 0.05 to 5.0 percent.[38]

In addition, the AFC's calculations of hourly fugitive dust emissions appear to be based on an average hourly handling of materials rather than a worst-case scenario, *e.g.*, during the delivery of limestone or removal of fly ash. In order to demonstrate compliance with short-term ambient air quality standards, hourly emissions estimates should instead be based on worst-case circumstances.

Finally, it appears that the fugitive dust emission factors for PM10 and PM2.5 emissions were incorrectly calculated for all materials.

Data Requests:

66. Please re-calculate all PM10 and PM2.5 fugitive dust emissions emission factors and document your assumptions.

67. Please discuss and document the assumed annual average wind speed of 1 mile per hour in the biomass storage building. Please provide a worst-case wind speed that may be expected within the biomass storage building.

68. Please calculate worst-case hourly fugitive dust emissions from biomass handling assuming use of 100 percent agricultural wood waste and the maximum wind speed expected within the biomass building.

69. Please calculate average annual fugitive dust emissions for biomass handling assuming a typical annual average mix of biomass sources including municipal green waste and agricultural wood waste and annual average wind speed within the biomass storage building.

70. For both calculations in response to Data Requests 68 and 69, please include a breakdown of the individual source activities, *e.g.*, biomass unloading from the tractor trailers onto the conveyor, pre-sizing of biomass with "fuel aggregators," conveyor drop onto a storage pile, biomass loadout from the storage pile with diesel-powered mobile equipment and drop onto conveyor to combustor.

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[38] *See* AP-42, Section 13.2.4 "Aggregate Handling and Storage Piles," Table 13.2.4-1.

71. Please document the assumption of 1 percent moisture content in fly ash, lime, and limestone and provide a range of typical moisture content for these materials. Please calculate worst-case hourly and daily fugitive dust emissions and average annual fugitive dust emissions from fly ash, lime, and limestone handling.

Background: COOLING TOWER DRIFT

The Project would use wet surface air cooler ("WSAC") condensers, which combine a conventional cooling tower and turbine condenser in one unit (cell). The Project would use four two-cell WSACs.[39] The AFC calculates emissions from these WSAC condensers based on a total dissolved solids ("TDS") content of 600 milligrams per liter ("mg/L") in the makeup water, four cycles of concentration, and a drift rate of 0.0005 percent.[40,41]

According to the water balance diagram, the makeup water for the cooling tower of 741 gallons per minute ("gpm") would be supplied from the raw water/firewater storage tank and from the tertiary gray water receiving tank. The raw water/firewater storage tank would supply 623.7 gpm or 84 percent and the tertiary gray water receiving tank would supply 117.3 gpm or 16 percent of the makeup water.[42] According to the water balance diagram, the raw water/firewater storage tank would contain only raw untreated well groundwater with a TDS content of 2,250 mg/L.[43] The gray water receiving tank would contain mostly (81 percent) tertiary gray water from the City of Coalinga's future wastewater treatment facility ("WWTF").[44] According to the water balance diagram, the water in the raw water/firewater storage tank would not undergo any treatment before being routed to the cooling tower. Elsewhere, the Applicant stated that the Project would include a tertiary treatment system that would treat the WWTF's secondary effluent as well as various on-site recycle and reject streams. The water leaving the system would have a TDS content of approximately 700 ppm.[45] Thus, it appears that the TDS content of 600 mg/L in the cooling tower makeup water, which is

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[39] Applicant's Response to CEC Data Request #17.

[40] AFC, Appendix B-3 "Cooling Tower Drift Calculation."

[41] The AFC calculates drift emissions for two 2-cell cooling towers. According to the Applicant, emissions from the four 2-cell WSACs would be the same as the emissions from the cooling towers (*see* Response to CEC Data Request #17).

[42] Figure 5.5-3, Revised – Water Balance, San Joaquin Solar 1 & 2.

[43] AFC, Table 3.4-4.

[44] Applicant's Response to CEC Staff Data Adequacy Request, Water Resources #6.

[45] Applicant's Response to CEC Staff Data Adequacy Request, Water Resources #6.

composed of 84 percent well water (TDS 2,250 mg/L) and 16 percent tertiary treated WWTF water (TDS 700 mg/L) has been underestimated.

Data Requests:

72. Please demonstrate how the TDS content in the cooling water makeup water of 600 gpm was derived.

73. Please provide the TDS content for all sources that supply water to the cooling tower.

74. Please revise the drift loss calculations if necessary.

75. Please discuss whether the well groundwater would undergo any treatment before being routed to the cooling tower. If yes, please discuss the treatment and provide a water quality analysis for the treated water.

76. Please provide an updated water balance diagram that shows the tertiary treatment system.

Background: ROUNDTRIP DISTANCE FOR BIOMASS DELIVERY

Emissions from delivery trucks were estimated based on 12 hours per day, 5 days per week, and 200 days per year operation schedule. The miles traveled per round trip were assumed to be 1.4 miles on site and 120 miles for each delivery truck.[46] Considering that a large portion of the biomass would be sourced outside the 75 mile fuel supply study radius (*e.g.*, from San Francisco, San Mateo, Santa Cruz, Alameda, Contra Costa, and Sacramento counties, which are located 150 to 200 miles from Coalinga; *see* Data Request "Biomass Supply" above), the average roundtrip distance of 120 miles (or 60 miles per leg) for biomass deliveries assumed by the AFC appears to be considerably too low.

Data Requests:

77. Please revise the emission estimates for delivery trucks based on a realistic roundtrip distance assuming that less than 45 percent of the biomass can be sourced within a 75-mile radius. Please document your assumptions.

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[46] AFC, p. 5.2-21.

Background: WORKER CARPOOLING

The air quality analysis for combustion and fugitive dust emission associated with worker commuter vehicles during operation of the Project were estimated assuming a carpooling ratio of 1.5 employees per vehicle, and an average roundtrip distance of 50 miles "based on the distance to Fresno."[47] The AFC did not discuss how the carpooling ratio and roundtrip distance were derived or how realistic these values are. The assumption of a 1.5 carpooling factor is not consistent with the traffic analysis which does not account for carpooling.[48] The assumption is also inconsistent with the Worker /Delivery Commuting Emissions Calculations, provided in Appendix B-2 and submitted with the AFC, which assumes two workers per commuter vehicle. Further, the distance between Coalinga and Fresno is about 65 miles; thus, assuming as a worst-case scenario that all workers commute from Fresno, the average roundtrip distance would be 130 miles rather than 50 miles. Finally, the air quality analysis does not account for the estimated 8 visitor vehicles expected at the Project site during operations. [49]

Data Requests:

78. Please document how the carpooling ratio of 1.5 employees per vehicle was derived.

79. Please indicate whether the Applicant would implement a program that incentivizes employee carpooling, providing a description of any such program.

80. Please revise the air quality analysis for combustion and fugitive dust emissions to account for a realistic carpooling factor, roundtrip distance, and visitor vehicles.

Background: BACT FOR BIOMASS COMBUSTORS

In response to CEC staff data request 25, the Applicant proposed the following steady state BACT emission factors for the biomass combustors: 0.0039 lb/MMBtu for CO, 0.005 lb/MMBtu for VOC, and 0.01 lb/MMBtu for PM10. These emission factors are inconsistent with the Application for Authority to Construct ("ATC") submitted to the San Joaquin Valley Air Pollution Control District

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[47] AFC, p. 5.2-21 and AFC, Appendix B-2 "Total Project SJS 1&2, Emissions from Workers Commuting Trips during Normal Operations," Note 6, and "Fugitive Emissions from Passenger Vehicle Travel on Paved Roads."

[48] AFC, Table 5.11-6, p. 5.11-10.

[49] *Ibid.*

("SJVAPCD"): 0.02 lb/MMBtu for CO, 0.003 lb/MMBtu for VOC, and 0.014 lb/MMBtu for PM10. Both sources are further inconsistent with the PM10 emission factor of 0.025 lb/MMBtu used for the emission calculations presented in the AFC, Appendix B-3, and the Application for an ATC.

Data Requests:

81. Please clarify the proposed BACT emissions rates for CO, VOC, and PM10 for the biomass combustors.

82. Please revise the emission calculations and/or BACT analyses for these pollutants accordingly.

Background: SCR AND SCR CONTROL SYSTEMS OPERATION

The Applicant proposes the use of selective catalytic reduction ("SCR") and selective non-catalytic reduction ("SNCR") with aqueous ammonia injection for the control of NOx emissions from the biomass combustors. Both SCR and SNCR systems must be operated within certain temperature ranges to be effective and to minimize ammonia slip.[50]

The AFC proposes to limit the ammonia slip from the SCR and SNCR controls systems to 5 parts per million ("ppm").[51] The AFC does not discuss whether the Project would be able to meet this ammonia slip limit during cold or warm startup and shutdown of the biomass combustors. Further, recent guidance by the Massachusetts Department of Environmental Protection for new biomass projects suggests that a lower ammonia slip limit of 2 ppm is feasible during normal operations.[52]

Literature indicates that relevant concentrations of undesired side products such as isocyanic acid ("HNCO"), nitrous oxide ("N_2O"), ammonia, hydrogen cyanide ("HCN"), and others can be formed in the SCR and SNCR systems under

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[50] Northeast States for Coordinated Air Use Management ("NESCAUM"), Controlling Emissions from Wood Boilers, Draft, October 9, 2008; http://www.nescaum.org/documents/controlling_emissions_from_wood_boilers.pdf/, accessed June 5, 2009.

[51] AFC, p. 5.2-60.

[52] Commonwealth of Massachusetts, Department of Environmental Protection, Memorandum from James Colman to Biomass Energy Stakeholders, Re: BACT Guidance for Biomass Projects, April 18, 2007; http://www.mass.gov/dep/air/laws/biombact.doc, accessed May 14, 2009.

unfavorable conditions. The AFC does not discuss any potential side products from the operation of the Project's SCR and SNCR systems.

Data Requests:

83. Please discuss the feasibility of a 2 ppm ammonia slip limit for the Project's NOx control during normal operations.

84. Please indicate whether the Project would be able to meet the 5 ppm ammonia slip limit during cold or warm startup and shutdown of the biomass combustors.

85. Please discuss and quantify the potential side product formation from the SCR and SNCR systems such as isocyanic acid, nitrous oxide, ammonia, hydrogen cyanide, etc. under unfavorable conditions.

Background: FUGITIVE EMISSIONS OF HEAT TRANSFER FLUID

The operational emissions estimates presented in the AFC do not account for fugitive emissions from the heat transfer fluid system, *e.g.*, from flexible hoses, valves, etc., or for larger equipment leaks and spills.[53] Experience at other solar parabolic trough facilities has shown that volatilization accounts for an annual loss of approximately 0.08 percent of the total circulating heat transfer fluid. Total loss of heat transfer fluid at the Kramer Junction, CA, SEGS III through VII facilities is estimated at about 0.5 percent per year.[54] Each of the Project's solar facilities will contain 185,000 gallons of heat transfer fluid in the circulating system.[55] Thus, based on experience at other facilities, the Project would likely experience an annual loss of about 18,500 gallons of heat transfer fluid,[56] some of which would volatilize. Some or all of these heat transfer fluid losses would vaporize as volatile organic compounds ("VOCs") which would contribute to, but are not accounted for, in the Project's operational emissions inventory.

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[53] AFC, Table 5.2-12, p. 5.2-23.

[54] Gilbert E. Cohen, KJC Operating Company, David W. Kearney, Kearney & Associates, and Gregory J. Kolb, Sandia National Laboratories, Solar Thermal Technology Department, Final Report on The Operation and Maintenance Improvement Program for Concentrating Solar Power Plants, SAND99-1290, June 1999; p. 30 and Appendix Z, Fugitive Emissions; http://www.osti.gov/bridge/servlets/purl/8378-FznIXP/webviewable/8378.pdf, accessed May 27, 2009.

[55] AFC, p. 3-18.

[56] (185,000 gallons heat transfer fluid per plant) × (2 plants) × (5 percent loss of heat transfer fluid per year) = 18,500 gallons heat transfer fluid loss per year

Data Requests:

86. Please provide estimates for annual fugitive VOC emissions from heat transfer fluid system components and from larger equipment leaks and spills and include these estimates in the operational emissions inventory.

Background: AMBIENT AIR QUALITY MODELING FOR PROJECT OPERATIONS

The AFC's ambient air quality modeling for Project operations include only stationary sources and does not account for emissions from delivery trucks, maintenance vehicles, and the biomass loader. The AFC finds that nitrogen dioxide ("NO_2") emissions from stationary sources would result in a total concentration of NO_2 in ambient air of 333.0 μg/m^{3,} which is just 6 μg/m^3 below the 1-hour California ambient air quality standard for NO_2.[57] Including emissions from mobile sources in the ambient air quality modeling may result in exceedance of the 1-hour California ambient air quality standard for NO_2.

Data Requests:

87. Please revise the ambient air quality modeling for Project operations to include emissions from mobile sources.

Background: INTERPOLLUTANT OFFSET TRADES

The Project site is a designated nonattainment area for state PM10 standards, and a designated ozone non-attainment area under both state and federal standards.[58] Fine particulates, referred to as PM2.5, are a subset of PM10. Emissions of PM2.5 result from fuel combustion, and residential and agricultural burning. These emissions are considered more harmful to human health because fine particulate matter can be inhaled deep into the lungs, where it can persist and cause respiratory damage. The Project site is in a nonattainment area with respect to both the federal and state PM2.5 standards. According to the AFC, the Project will exceed offset triggers for NOx, VOC, CO, SO_2 and PM10.[59] The AFC states that the San Joaquin Valley Air Pollution Control District ("SJVAPCD") allows the use of certain interpollutant offsets, and that the Applicant may seek to offset PM10

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[57] AFC, p. 5.2-36.

[58] AFC, p. 5.2-4, 5.2-6.

[59] AFC, p. 5.2-61.

emissions with SOx emission reduction credits ("ERCs").[60] The U.S. EPA has not yet approved the underlying methodology for interpollutant trades, as is required by Rule 2201.

Rule 2201 of the SJVAPCD Air Quality Plan applies to the Project.[61] Section 4.13.3 of Rule 2201 provides that interpollutant offsets may be approved by the Air Pollution Control Officer ("APCO") on a case by case basis, provided that "the applicant demonstrates to the satisfaction of the APCO, that the emission increases from the new or modified source will not cause or contribute to a violation of an Ambient Air Quality Standard." Section 4.13.3.4 states that "PM10 shall not be allowed to offset NOx or reactive organic compound emissions in ozone nonattainment areas."

Data Requests:

88. Please provide offset protocols and methodologies that have been developed by the Applicant to offset PM10 emissions through interpollutant offsets, pursuant to Rule 2201.

89. In the event that the Applicant and the SJVAPCD cannot gain approval from the U.S. EPA with regard to interpollutant offset schemes, please identify other opportunities available to the Applicant to offset emissions of PM10.

90. Please state whether the Applicant intends to employ interpollutant offsets, pursuant to Rule 4.13.3, to offset emissions of PM2.5.

91. Please state how the use of interpollutant offsets for emissions of PM10 will not contribute to a violation of California Ambient Air Quality Standards for PM10.

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[60] AFC, p. 5.2-45.

[61] *See* AFC, p. 5.2-60.

PUBLIC HEALTH AND SAFETY

Background: **HEALTH RISK ASSESSMENT FOR PROJECT OPERATIONS**

The AFC provides the results of a health risk assessment for operational emissions from the biomass combustors, combustor natural gas burners, cooling towers, diesel emergency generators, fire water pumps and handling of fly ash.[62] The AFC does not include emissions from diesel-powered mobile equipment. The AFC finds that the incremental cancer risk from the stationary sources would be 8.63 in one million.[63] Inclusion of diesel particulate emissions from mobile sources (delivery trucks, maintenance equipment, biomass loader) in the Project operational health risk assessment may result in exceedance of the significance threshold for incremental cancer risk of 10 in one million.

Data Requests:

92. Please revise the health risk assessment for Project operations to include diesel particulate emissions from diesel-powered mobile equipment (delivery trucks, maintenance equipment, biomass loader).

WASTE MANAGEMENT

Background: **EVAPORATION POND RESIDUES**

The AFC proposes to use a lined evaporation pond to dispose of the Project's wastewater streams (with the exception of the sewage which will be routed to an on-site septic system).[64] The AFC contains no discussion of the quantity of residual solids generated in the evaporation ponds during the life of the Project and their ultimate disposal. Depending on the concentration of constituents, the dewatered residues might have to be deposed of as a hazardous waste. This would require special handling and disposal.

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[62] AFC, Tables 5.16-2 – 5.16-5, pp. 5.16-9 – 5.16-13.

[63] AFC, p. 5.16-15.

[64] AFC, p. 5.5-13.

Data Requests:

93. Please discuss whether the dewatered residues from the evaporation ponds would constitute hazardous wastes.

HAZARDOUS MATERIALS

Background: HEAT TRANSFER FLUID LEAKS AND SPILLS

The AFC contains no discussion of the potential for heat transfer fluid leaks and spills nor does it contain a description of detailed cleanup procedures for such events. The AFC generically indicates that "[c]ontaminated soil produced during spill cleanup will [*sic*] stored, transported, and disposed of in accordance with local, state and federal regulations" but contains no discussion of the type of soil contamination that would be produced from a leak or spill of heat transfer fluid.[65]

Fluid leaks from the heat transfer system are not uncommon events at existing solar parabolic trough facilities such as the nine Solar Energy Generating Systems ("SEGS") plants in the Mojave Desert.[66] For example, on March 5, 2002, a weld failure in the piping at the SEGS IX plant caused the release of 300 gallons of heat transfer fluid.[67] On April 4, 2002, 70 gallons of heat transfer fluid were released at one of the Harper Lake SEGS plants when a vent valve was left open during valving of a solar field loop.[68] On May 6, 2002, the failure of a flexible connection hose at one of the Kramer Junction SEGS facilities resulted in the release of 150 gallons of heat transfer fluid.[69] On February 27, 2007, a piping failure in the heat transfer system at one of the Kramer Junction SEGS facilities

[65] AFC, p. 5.15-8.

[66] SEGS III–VII (150 MW) are located at Kramer Junction, SEGS VIII–IX (160 MW) at Harper Lake, and SEGS I–II (44 MW) at Daggett, respectively.

[67] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 02-1227; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

[68] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 02-1867; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

[69] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 02-2646; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

resulted in a 1,000 gallon spill of heat transfer fluid.[70] On July 16, 2007, the packing on a valve failed at one of the Kramer Junction SEGS facilities and resulted in release of heat transfer fluid.[71] On February 25, 2008, the failure of a flexible connection at the SEGS VIII plant resulted in the spill of 250 gallons of heat transfer fluid.[72] On March 20, 2009, a flex hose at one of the SEGS plants ruptured and spilled approximately 20 gallons heat transfer fluid.[73] Clearly, leaks and spills are not uncommon events at parabolic trough solar facilities.

Soil contaminated with heat transfer fluid must be either disposed of as hazardous waste or may be treated on site. The Beacon Solar Energy Project, for example, proposes to install an on-site soil bioremediation facility to treat soil contaminated with heat transfer fluid.[74]

Data Requests

94. Please provide a discussion of monitoring for leaks from the heat transfer system, *e.g.*, with pressure monitoring and routine inspections (sight, sound, smell).

95. Please provide a discussion of the proposed cleanup and repair procedures in the event of a leak or spill.

96. Please discuss the feasibility of treating soil contaminated with heat transfer fluid on site, *e.g.*, through incineration or treatment with bioremediation.

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[70] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 07-1268; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

[71] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 07-4241; http://www.oes.ca.gov/operational/malhaz.nsf/, May 26, 2009.

[72] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 08-1582; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

[73] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, Cal EMA Control No. 09-2420; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

[74] Beacon Solar Energy Project, Application for Certification, March 2008, p. 2-19; http://www.energy.ca.gov/sitingcases/beacon/documents/applicant/afc/2.0%20Project%20Description.pdf, accessed May 27, 2009.

Background: HEAT TRANSFER FLUID FIRE RISK

The heat transfer fluid Therminol VP-1 that would be used in the heat transfer system of the Project is a combustible liquid. Yet, the AFC does not contain a discussion of potential risks due to the flammability of the heat transfer fluid.[75]

Fires in parabolic trough solar generating facilities such as the Project are not uncommon and pose serious threats.[76] For example, in 1999, a storage tank containing 900,000 gallons of Therminol exploded at the SEGS II solar power plant in Daggett, CA.[77] On August 2, 1994, one of the heat transfer fluid pipes at the SEGS VI facility at Kramer Junction, CA, ruptured and the spilled heat transfer fluid caught fire.[78] In another incident on August 21, 1995, a heat transfer fluid pump caught fire at the Daggett facility.[79] More recently, on March 5, 2002, a weld failure in the piping at the SEGS IX plant caused leaking of heat transfer fluid resulting in a fire.[80] On March 20, 2009, a flex hose containing Therminol ruptured and caught fire at one of the Harper Lake SEGS plants.[81]

Because fires in parabolic trough solar facilities are serious threats and have occurred, such facilities have in the past been built away from residential or industrial areas. Here, the Applicant proposes to construct the solar facilities immediately adjacent to a hospital and close to a prison facility without discussing the potential fire and explosion risks associated with the facility.

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[75] AFC, p. 5.6-22.

[76] Leitner A., RDI Consulting, Fuel from the Sky, Solar Power's Potential for Western Energy Supply, NREL/SR-550-32160, July 2002, p. 90; http://www.nrel.gov/csp/pdfs/32160.pdf , accessed May 27, 2009.

[77] CBS News, Blast: Big Flames, No Injuries, February 27, 1999; http://www.cbsnews.com/stories/1999/02/27/national/main36899.shtml?source=search_story, accessed May 26, 2009.

[78] California Emergency Management Agency, Governor's Office of Emergency Services, 1994 Hazardous Materials Spill Report Archive, OES Control No. 3427; http://rimsinland.oes.ca.gov/archive/MALHaz94.nsf, accessed May 26, 2009.

[79] California Emergency Management Agency, Governor's Office of Emergency Services, 1995 Hazardous Materials Spill Report Archive, OES Control No. 9659; http://rimsinland.oes.ca.gov/archive/MALHaz95.nsf, accessed May 26, 2009.

[80] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, OES Control No. 02-1227; http://rimsinland.oes.ca.gov/Archive/malhaz22.nsf/, accessed May 26, 2009.

[81] California Emergency Management Agency, Governor's Office of Emergency Services, Hazardous Materials Spill Report, OES Control No. 09-2420; http://www.oes.ca.gov/operational/malhaz.nsf/, accessed May 26, 2009.

Data Requests:

97. Please provide a discussion and risk analysis of potential fire and explosion risks due to the flammability of the heat transfer fluid Therminol VP-1.

Background: OFFSITE CONSEQUENCE ANALYSIS FOR AMMONIA STORAGE TANKS

The AFC contains an offsite consequence analysis for the Project's four 20,000 gallons ammonia storage tanks. The analysis was performed for two hypothetical accidental release scenarios: a) worst-case (failure of one 20,000 gallon ammonia storage tank under worst-case meteorological conditions) and b) alternative (spill from the piping between the storage tank and the process equipment under more common meteorological conditions).[82] The AFC does not discuss why the failure of one rather than all four 20,000 gallon ammonia storage tanks was considered the worst case scenario.

The Project site is located in a moderately to highly seismic region of California with the San Andreas Fault located approximately 19 miles east of the Project. [83] Thus, it appears conceivable that in case of a strong earthquake all four storage tanks could fail simultaneously. The AFC does not discuss the probability of such an event.

The Project would contain a bermed containment area surrounding the ammonia storage tank area which would be large enough to hold the contents of two 20,000-gallon ammonia storage tanks. Thus, in the event of a catastrophic failure of more than two tanks, the bermed containment area would be too small to hold the released liquid. Other facilities, for example, the Carlsbad Energy Center, include containment areas for each tank large enough to contain its entire content.[84]

Data Requests:

98. Please discuss the potential for catastrophic failure of all four ammonia storage tanks, *e.g.*, during a strong earthquake.

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[82] AFC, p. 5.15-9.

[83] AFC, p. 5.3-1.

[84] Carlsbad Energy Center Project, Application for Certification (07-AFC-06), Appendix 5.5B, Off-Site Consequence Analysis; http://www.energy.ca.gov/sitingcases/carlsbad/documents/applicant/afc/CECP_Volume%202-Appendices/Appendix%205.5B_Offsite%20Consequence%20Analysis.pdf, accessed June 8, 2009.

99. Please discuss the feasibility of enlarging the containment areas to contain all contents of the tanks contained within.

Dated: July 27, 2009

Respectfully submitted,

__________/s/_______________

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STATE OF CALIFORNIA

Energy Resources Conservation

and Development Commission

In the Matter of: The Application for Certification for the San Joaquin Solar 1 and 2 Hybrid Power Plant Project	Docket No. 08-AFC-12

DECLARATION OF SERVICE

I, Bonnie Heeley, declare that on July 27, 2009, I served and filed copies of the attached **CALIFORNIA UNIONS FOR RELIABLE ENERGY DATA REQUESTS, SET THREE**. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at http://www.energy.ca.gov/sitingcases/sjsolar/SJSOLAR_POS.PDF. The document has been sent (1) electronically, and (2) via US Mail by depositing in the US Mail at South San Francisco, CA, with first-class postage thereon full prepaid and addressed as provided on the attached Proof of Service list to those addresses NOT marked "email preferred." It was sent for filing to the Energy Commission by sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address shown on the attached Proof of Service list.

I declare under penalty of perjury that the foregoing is true and correct. Executed at South San Francisco, California, on July 27, 2009.

______________/s/__________________
Bonnie Heeley

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