DOCKET
07-AFC-8
DATE JAN 19 2009
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RESPONSES TO CURE DATA REQUESTS SET THREE

APPLICATION FOR CERTIFICATION (07-AFC-8)
Carrizo Energy Solar Farm
Carrizo Energy, LLC

Submitted to:
California Energy Commission

Submitted by:
Carrizo Energy, LLC

With Support from:

URS

1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108

January 2009

January 19, 2009

Mr. John Kessler
Project Manager
Attn: Docket No. 07-AFC-8
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512

Subject: Carrizo Energy Solar Farm (07-AFC-8)
Applicant's Responses to CURE Data Requests Set 3 (#96-107)
URS Project No. 27658060.01800

Dear Mr. Kessler:

On behalf of Ausra CA II, LLC (dba Carrizo Energy, LLC), URS Corporation Americas (URS) hereby submits the Applicant's Responses to CURE Data Requests Set 3 (#96-107) (Carrizo Energy Solar Farm 07-AFC-8).

I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge. I also certify that I am authorized to submit the Applicant's Responses to CURE Data Requests Set 3 (#96-107) on behalf of Carrizo Energy, LLC.

Sincerely,

URS CORPORATION

Angela Leiba
Project Manager

AL:ml

Enclosure

URS Corporation
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Data Request Response Guide

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TECHNICAL AREA: AIR QUALITY

Background: On-Site Temporary Manufacturing Building

Data Request 96: Please advise whether the Applicant intends to obtain a Conditional Use Permit for the temporary manufacturing building from the County of San Luis Obispo.

Response: Per Applicant's responses to CEC Data Requests 102 and 103:

Per telephone communication between John McKenzie (San Luis Obispo) and Seth Hopkins (URS) on August 4, 2008, Mr. McKenzie has confirmed that the County would consider the onsite manufacturing to be an activity related to the construction of CESF apparatus. According to section 22.06.030 of the Land Use Ordinance (LUO), electrical generation is an allowable use in the Agriculture district subject to a Conditional Use Permit (CUP) required by the specific use standards stated in section 22.32.020 of the LUO. According to the County, all construction related activities would be subject to the same CUP for the CESF Project, and therefore consistent with the General Plan and LUO.

Per telephone communication between John McKenzie (San Luis Obispo County) and Seth Hopkins (URS) on August 4, 2008, Mr. McKenzie has confirmed that the County would not require an additional CUP or MUP for the onsite manufacturing building. Assembly activities would be allowed as a construction related activity as part of the CESF Project CUP.

TECHNICAL AREA: AIR QUALITY

Background: On-Site Temporary Manufacturing Building

Data Request 97: Please advise whether the Applicant intends to apply for an Authority to Construct and Permit to Operate for the temporary manufacturing building including evaporative cooling and utility services from the San Luis Obispo County Air Pollution Control District ("District"). If the Applicant does not intend to obtain permits from the District, please discuss why it deems these permits not necessary.

Response: The Applicant does not intend to apply for an Authority to Construct and Permit to Operate for the temporary manufacturing building. The activities and equipment operating within this building are exempt from permitting according to SLOAPCD Rules (SLOAPCD Rule 201).

TECHNICAL AREA: AIR QUALITY

Background: On-Site Temporary Manufacturing Building

Data Request 98: Please clarify whether dismantling of the temporary manufacturing building would add an additional four months to the 35-month construction schedule or whether the 35-months are inclusive of dismantling the structure.

Response: Per Section 1.4.7.3 of the Supplement to the CESF AFC, dismantling of the onsite manufacturing building will occur during the last four months of the 35-month construction schedule.

TECHNICAL AREA: AIR QUALITY

Background: On-Site Temporary Manufacturing Building

Data Request 99: Please clarify whether the foundation for the on-site manufacturing building would require piles as support or whether it would rest on a 6-inch reinforced spread footing. In case pile support would be required for the manufacturing building, please:

a. Specify which type of piles would be required, e.g., timber, precast concrete, steel, etc., and which types of pile-driver would be used, i.e., hydraulic or vibratory.
b. Specify the maximum rated energy in ft-lbs for the pile driver that would be used.
c. Specify the emissions rates for the pile driver that would be used and quantify emissions from pile driving.
d. Confirm that the piles for the temporary manufacturing building would be removed from the site after dismantling of the building.
e. Indicate whether the Applicant would be willing to accept a Condition of Certification stipulating implementation of the responses to above data requests 99.a) through 99.d).

Response: The foundation for the onsite manufacturing building would rest on spread footing. No pile driving will be used for the temporary manufacturing building, therefore, requests a., b., c., d., and e., above, are not applicable.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 100: Please specify the control efficiency for the bag filters that would be used for controlling particulate matter emissions from the welding cell and identify how compliance with the specified control efficiency would be determined.

Response: Particulate emissions associated with the proposed welding operation will occur due to welding rod usage and vaporization of galvanized zinc on the reflector frames. The welding cell will be completely enclosed and will vent to a fabric filter baghouse. The estimated particulate control efficiency of the fabric baghouse is 90%. Continuing attainment of this efficiency will be ensured by the use of filters designed for 90% control and by following manufacturer recommendations regarding proper operation and maintenance of this equipment, including but not limited to visual inspection, cleaning, and repair of the bag filters.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 101: Please quantify daily and annual uncontrolled and controlled particulate matter emissions from zinc vaporization and total PM10 and PM2.5 emissions from the welding cell.

Response: PM_{10} emissions would be generated during the welding operations from both the weld rod usage and vaporization of the zinc coating on the reflector frames. To a first approximation, it is assumed that all particulate emissions from both processes will have an aerodynamic diameter of 2.5 microns or less and would thus be considered to be both PM_{10} and $PM_{2.5}$. As described in the previous response, emissions of these particulates are expected to be reduced by at least 90 percent by the fabric filter baghouse system that will be provided for the welding cell. The estimated maximum daily and annual uncontrolled and controlled particulate emissions associated with the welding unit are summarized in Table 101, below. These estimates were obtained by linear scaling of the corresponding permitted numbers for the Las Vegas manufacturing facility on the basis of the relative production rate estimates of the two facilities (700 MW of panels per year at Las Vegas and 79 MW of panels per year at CESF).

TABLE 101
ESTIMATED MAXIMUM CESF PM EMISSIONS DUE TO WELDING IN TEMPORARY MANUFACTURING FACILITY

Activity	PM Emissions Uncontrolled		PM Emissions Controlled	
	(lb/day)	(tpy)	(lb/day)	(tpy)
Weld Rod	33.43	6.10	3.34	0.61
Zinc Vapor	0.82	0.15	0.08	0.01
TOTAL	34.26	6.25	3.43	0.62

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 102: Please indicate whether the on-site manufacturing building would control adhesive volatilization with a carbon adsorption system, and, if yes, please specify the VOC/HAP control efficiency and identify how compliance with the specified control efficiency would be determined.

Response: An adhesive will be applied to the mirrors in an enclosed system and associated vapors will be captured in a vacuum duct that will vent to a carbon adsorption system of the same design used for Ausra's Las Vegas manufacturing facility. The minimum control efficiency for removal of VOC and HAP emissions generated during the application of the adhesive is 99%. Continuing achievement of this control efficiency will be realized by the use of a carbon adsorption system designed to achieve at least 99% control, and by adhering to the manufacturer's recommended operating and maintenance procedures, including changeout of used carbon beds on a timely basis.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 103: Please identify the individual VOCs and HAPs and specify their content in the polyurethane adhesive used to affix mirrors to the reflector frames.

Response: Polyurethane adhesive will be used to affix mirrors to the reflector frames. The adhesive was selected because it meets California Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAP) regulations for use in well ventilated buildings. The Applicant anticipates using an adhesive such as Sikaflex® 252 or similar. The Material Safety Data Sheet (MSDS) for the Sikaflex® 252 adhesive is categorized as polyurethane that consists primarily of polyisocyanate pre-polymer, which is a proprietary compound. The only federal HAP listed on the MSDS is xlyene (mixed isomers), which is expected to constitute 1% to 5% by weight of the adhesive. The total VOC content of the selected adhesive is 5.3% by weight.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 104: Please quantify daily and annual uncontrolled and controlled HAP and VOC emissions (individual and total) from the polyurethane adhesive used to affix mirrors to the reflector frames.

Response: The Applicant anticipates using an adhesive such as Sikaflex® 252 or similar. As an example of emissions associated with a polyurethane adhesive, calculations for Applicant's response to Data Request 104 were made using the data provided on the Sikaflex® 252 MSDS.

Emissions of VOC and xylenes (the only federal HAP contained in the Sikaflex® 252 adhesive) were calculated based on the conservative assumption that all VOCs contained in this compound would occur in the form of xylenes (see Response to Data Request 103, above). The daily mass usage rate of the adhesive was assumed to 253 kg/hour. This value was estimated to be the usage rate that would result in the production of 79 MW worth of solar panels per year on a schedule of 12 hours per day, 5 days per week, and was derived by linearly ratioing the 80 kg/hour of adhesive that would be used at the Ausra Las Vegas manufacturing facility to produce 700 MW of panels operating on a schedule of 24-hour per day, 7 days per week. Full volatilization of the VOC and xylenes was conservatively assumed to occur during application of the adhesive, and 99% control efficiency for both VOC and xylenes was assumed to be achieved by the carbon adsorption system (see Response to Data Request 102, above). Table 104 shows the predicted maximum daily and annual emissions for both the controlled and uncontrolled cases.

TABLE 104
ESTIMATED MAXIMUM UNCONTROLLED AND CONTROLLED EMISSIONS OF VOC AND HAPS DUE TO APPLICATION OF ADHESIVE

Pollutant	Uncontrolled Emissions		Controlled Emissions	
	lb/day	tons/year	lb/day	tons/year
VOC	37.46	4.88	0.37	0.05
HAP (Xylenes)	37.46	4.88	0.37	0.05

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 105: Please quantify the waste materials generated during manufacturing of the solar panels including baghouse filter wastes, discarded mirror glass, and empty adhesive drums.

Response: Per Applicant's response to CEC Data Request 131:

Summary of On-Site Manufacturing Waste Streams and Management Methods[1]

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On-site Treatment	Waste Management Method
Waste Adhesive - Hazardous	Adhesive	30 liters	Per day	Store for <90 days	Dispose to hazardous waste disposal facility
Waste Adhesive Prep (polyurethane) - Hazardous	Adhesive preparation	2 liters	Per day	Store for <90 days	Dispose to hazardous waste disposal facility
Empty Adhesive Drums - Hazardous	Adhesive use	5 empty drums	Per day	Store for <90 days	Dispose to hazardous waste disposal facility
Mirror Glass – Non-hazardous	Mirror manufacturing	100 kg	Per week	None	Recycle or dispose of to non-hazardous waste disposal facility
Waste Filters Containing Copper, Manganese, and Zinc Oxide	Air cleaning system filters	Copper = 160 ug Manganese = 5 ug Zinc oxide = 1024 ug	Per day	Store for <90 days	Recycle

Note:
[1] All numbers are estimates.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 106: Please quantify the waste materials generated from dismantling of the temporary manufacturing building.

Response: Per Applicant's response to CEC Data Request 129, the onsite manufacturing building will be constructed of reinforced concrete flooring with a modular panel system for walls and roofing. The modular panel systems will be dismantled and removed from the Project site after manufacturing operations are complete for reuse at another location. Wastes from dismantling of the manufacturing building will include concrete and rebar as summarized below.

Summary of Demolition of On-Site Manufacturing Building Waste Streams and Management Methods[1]

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On-site Treatment	Waste Management Method
Demolition waste -Non-hazardous	Concrete and rebar	65 ksf at 6" slab	Generated during demolition of onsite manufacturing building	None	Dispose to recycling facility (70-90%) or dispose to a non-hazardous waste landfill

Note:
[1] All numbers are estimates.

TECHNICAL AREA: AIR QUALITY

Background: Emissions from On-Site Manufacturing of Solar Panels

Data Request 107: Please quantify the number of truck trips associated with off-site disposal of waste materials from on-site manufacturing.

Response: Per Applicant's response to CEC Data Request 126, truck trips associated with offsite disposal of waste materials from onsite manufacturing would be included within the trips identified in the line labeled "Onsite Manufacturing."

Table 2.11-1
Peak Construction Trip Generation

	Peak Daily Trips	Average	AM Peak Hour Trips			PM Peak Hour Trips	
		Daily Trips	In	Out		In	Out
Peak CESF Construction (Workers) Buses	84	52	21	21		21	21
Equipment Deliveries	14	6	4	4		0	3
Construction Trucks	75	36	5	5		0	5
Onsite Manufacturing	15	12	2	2		1	2
Total Trips Per Peak Hour	**188**	**106**	**32**	**32**		**22**	**31**

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *CARRIZO ENERGY SOLAR FARM PROJECT*	**Docket No. 07-AFC-8** **PROOF OF SERVICE** **(Revised 11/25/2008)**

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-8
1516 Ninth Street, MS-15
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DECLARATION OF SERVICE

I, Kristen E. Walker, declare that on January 19, 2009, I deposited copies of the attached Applicant's Responses to CURE Data Requests Set 3 (#96-107) in the United States mail (FedEx) with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.