

CH2M HILL

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CH2MHILL

July 19, 2007
322752

DOCKET	
06-AFC-2	
DATE	JUL 19 2007
RECD.	JUL 19 2007

Mr. Robert Worl
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: AES Highgrove Project (06-AFC-2)
Data Response, Set 1C

Dear Bob:

On behalf of the AES Highgrove LLC, please find attached one original and 12 copies of Data Response, Set 1C, in response to Staff's Data Requests dated October 5, 2006 and changes in the Project Description as a result of AFC Supplement C.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

c: Project File
Proof of Service List

AES HIGHGROVE PROJECT (06-AFC-2)

DATA RESPONSE, SET 1C **(Responses to Data Requests: Visible Plume Modeling 74 and 76-79)**

Submitted by
AES Highgrove, LLC.

July 19, 2007



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

AES HIGHGROVE PROJECT (06-AFC-2) DATA RESPONSES, SET 1C

Technical Area: Visible Plume Modeling
CEC Author: Joe Loyer

BACKGROUND

Staff intends to conduct a plume modeling analysis using the Combustion Stack Visible Plume (CSVP) model and the Seasonal Annual Cooling Tower Impact (SACTI) model for the project, as is done for all projects with cooling towers. Staff will provide the applicant with a copy of the CSVP model training manual upon request.

DATA REQUEST

74. Please provide the values for heat rejection (MW/hr), exhaust temperature, and exhaust mass flow rate that affect cooling tower vapor plume formation for a range of ambient conditions that represent reasonable worst-case operating scenarios. At a minimum, please fill in all blanks in the table below. Please also update/correct the table, if necessary.

Parameter	Cooling Tower Exhausts		
Number of Cells	3 towers - 2 cells each		
Cell Height*	6.55 meters		
Cell Diameter*	4.88 meters		
Tower Housing Length (2 cells)*	16.84 meters		
Tower Housing Width (2 cells)*	12.65 meters		
Ambient Temperature	34 °F	72 °F	110 °F
Ambient Relative Humidity	80 %	65 %	50 %
Heat Rejection (MW/hr)			
Exhaust Temperature (°F)			
Exhaust Mass Flow Rate (lb/hr)			

*Stack dimensions from AFC.

Response: Table VPM74-1R presents the requested information for the new cooling tower.

TABLE VPM74-1R Cooling Tower Exhaust Characteristics	
Parameter	Cooling Tower Exhausts
Number of Cells	3 towers - 3 cells each
Cell Height* (Top of Fan Stack)	23.33 ft

**AES HIGHGROVE PROJECT
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DATA RESPONSES, SET 1C**

Cell Diameter* (@ top of Fan Stack)	12.13 ft		
Tower Housing Length (3 cells)*	42.27 ft		
Tower Housing Width (3 cells)*	22.42 ft		
Ambient Temperature	30 °F	80 °F	110 °F
Ambient Relative Humidity	30%	60%	15%
Heat Rejection (MMBtu/hr)	79.2	98.2	99.8
Exhaust Temperature (°F)	67.7	96.1	97.8
Exhaust Mass Flow Rate (lb/hr)	1,098,000	1,092,689	1,086,539

*preliminary.

BACKGROUND

Staff intends to model the visible plumes from the cooling tower using hourly estimated exhaust conditions based on the hourly ambient conditions of the meteorological file. Staff will assume saturated cooling tower exhaust at the exhaust temperature determined through interpolation for the hourly ambient conditions. Therefore, additional combinations of temperature and relative humidity, if provided by the applicant, will more accurately represent the cooling tower exhaust conditions.

DATA REQUEST

76. Please provide the cooling tower make and model number, and any vendor documentation available for the specific model.

Response: The proposed cooling towers are Marley NC Class model NC8312G-3. Attachment VPM 76 (in Data Response, Set 1A) includes available vendor data.

77. Please provide a fogging frequency curve from the cooling tower vendor, if available.

Response: See Attachment VPM-77R.

78. Please indicate how many cooling tower cells will be turned on under different potential partial load conditions. Please also note if ambient conditions, such as cold temperatures, dictate when cells may be turned off.

Response: It is anticipated that all three cells and fans will be operated at all times during operation to minimize the density of any plume that may form unless required to prevent freezing.

**AES HIGHGROVE PROJECT
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DATA RESPONSES, SET 1C**

79. Please confirm that the cooling tower fan motors will not have a variable speed/flow controller.

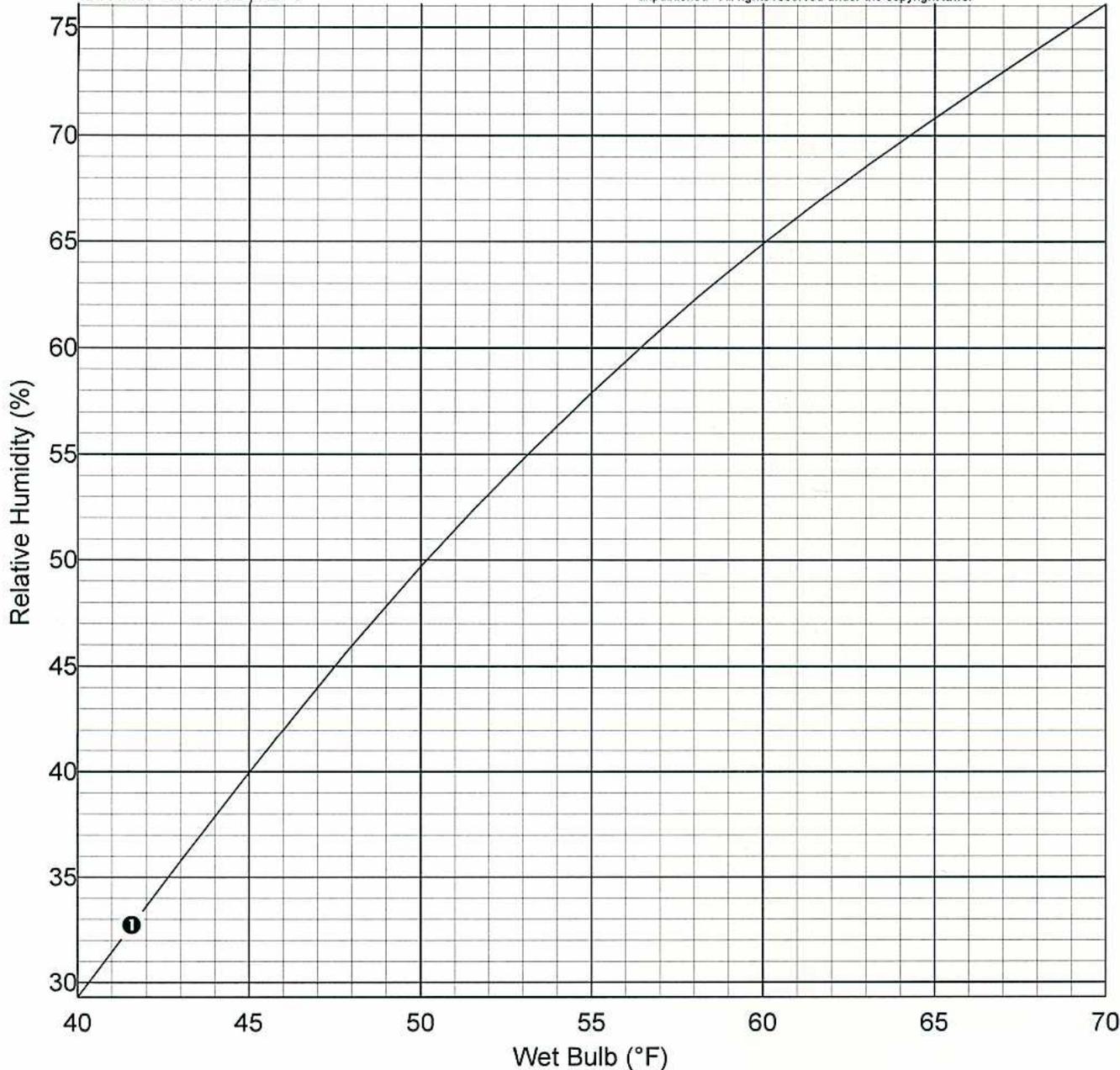
Response: The proposed tower does not have variable speed fans.

ATTACHMENT VPM-77R

Fogging Frequency Curve for
AES Highgrove
Grand Terrace, CA

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SPX Cooling Technologies
TRACS Version 04-AUG-06



Model NC8312G-03
Number of Cells 3
Motor Output 50HP
Motor RPM 1800
Fan 144C36N-6
Fan RPM 272
(Full Speed)

Design Conditions:
Flow Rate 7000GPM
Hot Water 113.00°F
Cold Water 85.00°F
Wet-Bulb 70.00°F

Curve Conditions:
Fan Pitch Constant
Flow Rate 7000GPM
(100% Design Flow)

Tangency 99.9%

FOGGING FREQUENCY CURVE: The curve shown to the left is referred to as a 'Fogging Frequency Curve'. The Fogging Frequency Curve separates entering cooling tower conditions that produce fog at the discharge (Top-Left region of chart) from those that do not produce fog (Bottom-Right region of chart)

1 28 °F Range



**CALIFORNIA
ENERGY
COMMISSION**

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**ELECTRONIC PROOF OF SERVICE LIST
Revised 4/23/07**

AES HIGHGROVE Power Plant Project
APPLICATION FOR CERTIFICATION,
DOCKET NO. 06-AFC-2

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I declare that 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.

John L. Carrier, J.D.
Program Manager
CH2M HILL

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE
STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION
FOR THE AES HIGHGROVE
POWER PLANT PROJECT

Docket No. 06-AFC-2
PROOF OF SERVICE
(Revised 4/23/07)

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 06-AFC-02
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
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DECLARATION OF SERVICE

I, Jeannette Harris, declare that on July 20, 2007, I deposited copies of the attached Data Response, Set 1C, filed for AES Highgrove Project (06-AFC-2), in the United States mail at Sacramento, CA 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.



Jeannette Harris