Air Quality Dispersion Modeling Summary for Permit No. PSD-3449-M2

Project: Hobbs Generating Station

Township: 18S Range: 36E Section: 24 County: Lea

UTM Coordinates: 658413 m East 3622425 m North Zone: 13 Datum: WGS 84 Elevation 3716 feet

Brief:

To improve the station performance, Hobbs is proposing to upgrade both CTGs by replacing the Row 1 Blade Ring and Rows 1 and 2 Turbine Blades and Vanes with new parts that have superior cooling technology. This change will result in the need for less cooling air and will have a corresponding increase in fuel consumption, exhaust flow rate, temperature, and electricity production. Although NOx, CO and VOC concentrations from the turbine exhaust will remain constant, there will be an increase in actual mass emission rates of these pollutants during routine operations due to the increased exhaust flow rate compared to historical past actual emission rates. Increases in particulate matter (PM10 and PM2.5} and S02, are also expected due to the increased fuel consumption. Permitted hourly emission rates for routine operations will not change.

This modeling brings the facility up to date by including 1-hr N02 and S02 analyses and 24-hr and annual PM2.5 analysis which were not required at the time of the original modeling in 2007.

Modeling Assumptions:

None

Permit Conditions:

The facility can operate 24 hrs/day, 7 days/wk, 52 wks/yr or a total of 8760 hrs/yr.

Conclusion :

This modeling analysis demonstrates that normal operation of the facility neither causes nor significantly contributes to any exceedences of applicable air quality standards. The standards relevant at this facility are NAAQS for S02, N02, PM2.5 and NMAAQS for N02 and Class II PSD increment for N02.

Action:

The permit can be issued based on this modeling analysis.
Modeling report submitted by CAMS eSPARC, dated April 7, 2014.The air quality analysis demonstrate compliance with applicable regulatory requirements.

Model(s) Used:

AERMOD was used to run the modeling analysis.
Note: Complete modeling input and output files can be made available and are located on the computer Aurora in the directory AQB\ModelingArchives\PSD_3449_Lea Power Partners_Hobbs Generating Station in zipped AQB and Cons files.

Number of Model Runs:

A total of five (5) model runs were made for this facility. One (1) ROI run for PM 2.5 and one (1) cumulative run for each of S02, N02, and PM2.5. A separate PSD Class II run for N02 was also done.

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Table 1: Table of Point Emissions and Stack Parameters

Source ID	Description	UTMH (m)	UTMV (m)	Elevation (m)	Height (m)	Temp (K)	ExitVel (m/s)	Dia (m)	NOx {lbs/hr)	502 (lbs/hr)	H2S {lb/hr)	CO {lbs/hr)	TSP (lbs/hr)	PM10 {lbs/hr)	PM25 (lbs/hr)
STKI annual		658431	3622590	I I46	50.29	354.8	21.70	5.49	16.53	I 0.70					17.1000
STK2 annual		658347	3622590	1 146	50.29	354.8	21.70	5.49	16.53	10.70					17. 1000
STKI I-hr		658431	3622590	3759	50.29	354.8	21.70	5.49	193.17	I0.70					17.1000
STK2 I-hr		658347	3622590	3760	50.29	354.8	21.70	5.49	193.17	10.70					17.1000
GEN		658402	3622410	1 146	3.17	75 1.5	0.00	1.00	0.29						0.2000
FIRE		658466	3622216	1 146	3.29	710.9	0.00	1.00	0.04						0.1000
FUELi		658365	3622232	1 146	4.57	588.7	I 0.30	2.50	0.31						0. 10001
FUEL2		658365	3622224	1 146	4.57	588.7	10.30	2.50	0.31						0.1000
FUEL3		658364	3622216	1 146	4.57	588.7	10.30	2.50	0.31						0.1000
CHILLI A		658499	3622365	1 146	4.65	425.6	10.82	3.05							0.0100
CHILLI S		658503	3622365	1146	4.65	425.6	10.82	3.05							0.0100
CHILLI C		658507	3622365	1146	4.65	425.6	10.82	3.05							0.0100
CHILLI D		658512	3622365	1 146	4.65	425.6	10.82	3.05							0.0100
CHILL2A		658499	3622381	1 146	4.65	425.6	10.82	3.05							0.0100
CHI LL2B		658503	3622381	1146	4.65	425.6	I0.82	3.05							0.0100
CHILL2C		658507	362238 1	1146	4.65	425.6	10.82	3.05							0.0100
CHI LL2D		658512	362238 1	1 146	4.65	425.6	10.82	3.05							0.0100
CHILL3A		658499	3622397	1 146	4.65	425.6	10.82	3.05							0.0100
CHILL3B		658503	3622397	1 146	4.65	425.6	10.82	3.05							0.0100
CHILL3C		658507	3622397	1 146	4.65	425.6	10.82	3.05							0.0100
CHI LL3D		658512	3622397	1146	4.65	425.6	10.82	3.05							0.0100
AUX I		658499	3622315	1 146	4.65	425.6	1 0.82	3.05							0.0200
AUX2		658499	3622319	1 146	4.65	425.6	I 0.82	3.05							0.0200
AUX3		658499	3622323	1146	4.65	425.6	10.82	3.05							0.0200

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Modeling Parameters:

All regulatory default options in AERMOD were used for these model runs. The use of stack-tip downwash, the calms and missing data processing routines, and default wind profile exponents were used. Building downwash produced by buildings at the facility was also considered. The rural dispersion land use option was used.

Complex Terrain Data

Both simple and complex types of terrain were used to model the facility. Elevations of receptors, facility sources, and surrounding sources were obtained from digitized USGS 7.5-minute maps and one degree maps.

Receptor Grid:

A nested Cartesian grid of 50m spacing along the fenceline, 1OOm spacing out to 1500m, 250m spacing out to 2500m, 500m spacing out to 5000m, and 1000m spacing out to 5km was used for the ROI and S02 and N02 modeling analysis. A subset of this grid using only receptors above the significance level was used for the PM2.5 CIA.

MET Data:

MET data collected at the Empire Abo facility in 1993-94 was used in the modeling analysis.

Adjacent Sources:

A total of 90 surrounding sources out to 25 km were identified and used in the cumulative modeling runs for N02, S02, and PM 2.5 CIA analysis.

Modeling Procedures:

First PM2.5 was modeled for the facility alone to determine the ROI. A subset of the original receptor grid using only significant receptors was used for the PM2.5 CIA analysis with background added from the Hobbs monitoring site 5ZS. 1-hr S02 and N02 and N02 PSD Class II were modeled with surrounding sources using the full original grid.

Setback Distance:

NA, this is a permanent facility.

NAAQS and NMAAQS:

Compliance with the 1-hr N02, 1-hr S02, and 24-hr and annual PM2.5 standards have been demonstrated as detailed in Table 2. S02 showed no significance so a cumulative analysis was not required. For N02 modeling no conversion factor was used for the 1-hr standard. A background concentration of 88 ug/m3 was added to the modeled 1-hr N02 concentration. A background concentration of 12.4 ug/m3 for the 24-hr analysis and 6.2 ug/m3 for the annual analysis was added to the modeled results for the PM2.5 analysis.

PSD Class I increment:

NA. The nearest PSD Class I area is Carlsbad Caverns National Park which is located 116 km from the facility. It is beyond the maximum distance of 1OOkm for including in a major source modeling analysis so PSD Class I impacts were not modeled for this facility.

PSD Class II increment:

Baseline dates for N02 and S02 have been triggered in AQCR 155 so PSD Class II modeling is required if pollutants are above significance levels. Neither pollutant subject to PSD Class II increment analysis at this facility was significant so no further analysis was required.as detailed in Table 2.

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Results / Discussion:

The analysis demonstrates ambient impacts will not exceed applicable federal and state standards. Results are detailed in Table 2.

Table 2: Ambient Impact from Emissions

j..:,nt	ContdbuUng Sources	A•g';ng Period	Concentration (ug/m3)	Receptor Elevation (m)	UTMH (m)	UTMV (m)	Distance From Site (m)	Radius Of Impact (km)	Applicable Standard	Value of Standard	Units	Percentage of Standard
S02	Alone	I-hour	3.26	1148.2	658300	3623400	982	0.0	Significance	6.60	ug/m3	49.3
N02	Alone	I-hour	26.82	3766.0	658200	3623300	901	14174.5	NAAQS	0.10	ppm	14.3
N02	Alone w/ background	I-hour	114.82	1148.2	658200	3623300	901	14.2	NAAQS	188.00	ug/m3	61.1
N02	Alone	PSD annual	0.49	1148.2	658606	3622525	217	0.0	Significance	1.00	ug/m3	48.7
PM2.5	Alone	24-hour	8.93	1144.8	658609	3622325	220	1.6	NAAQS	35.00	ug/m3	25.5
PM2.5	ALL	24-hour	24.34	1144.2	658479	3621959	471	1.6	NAAQS	35.00	ug/m3	69.6
PM2.5	Alone	annual	0.67	1144.8	658610	3622275	248	1.6	NAAQS	12.00	ug/m3	5.6
PM2.5	ALL	annual	8.30	1144.8	658610	3622275	248	1.6	NAAQS	12.00	ug/m3	69.2

75% annual conversion of NOX to N02 from EPA's Ambient Ratio Method (ARM) applied to calculate concentration.
40% 24-hour conversion of NOX to N02 using NMED's short term conversion applied to calculate concentration.