



Lea Power Partners, LLC
Hobbs Generating Station
Pre-Construction Air Monitoring Waiver
Request
Major Modification to PSD Permit 3449-M4
8 miles West of Hobbs, NM
Lea County, NM

REV1 October 2, 2018

Prepared for:

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1.0 INTRODUCTION

1.1 Project Summary

Lea Power Partners, LLC (LPP) is kindly requesting a waiver from the New Mexico Environment Department (NMED) Air Quality Bureau (aqb) to perform pre-construction monitoring for PM₁₀ and PM_{2.5} prior to submittal of a major modification application to existing Prevention of Significant Deterioration (PSD) Permit No. 3449-M4 under New Mexico Administrative Code (NMAC) 20.2.74.

LPP is proposing to upgrade two combustion turbines to the F4+ compressor upgrade offered by Mitsubishi Hitachi Power System Americas (MHPSA). The upgrade consists of replacing the Inlet Guide Vanes (IGVs) and first six stages of the compressor, resulting in increased air flow. The expected impact of the upgrade on performance is an increase of 5% in output, no change in heat rate, and a 6.7% increase in turbine exhaust flow.

Hobbs, NM is located in Lea County, an area that is classified by the US EPA as in attainment with the National Ambient Air Quality Standards (NAAQS) for all regulated pollutants. The facility is included as one of the 28-named sources under PSD rules and is a major source as defined by the PSD rules under 40 CFR §52.21. The estimated annual emission rate increases and PSD applicability analysis for the proposed compressor upgrade project are summarized in Table 1-1 below:

Table 1-1: PSD Applicability Analysis Both Units Combined

Pollutant	Past Actuals (tpy)	Proposed Project Annual w/o SSM (tpy)	Proposed Project Increase (tpy)	PSD SER (tpy)	PSD Review Required?
NO _x	89.9	124.9	35.0	40	No
CO	9.5	76.0	66.5	100	No
VOC	3.9	13.1	9.2	40	No
SO ₂	17.2	50.7	33.5	40	No
H ₂ SO ₄ (mist)	2.6	7.77	5.1	7	No
TSP/PM ₁₀	48.6	90.5	46.5	15	Yes
PM _{2.5}	48.6	90.5	46.5	10	Yes
CO ₂ e	1,604,421	1,985,998	381,577	75,000	Yes

In addition, LPP is proposing to relax the current federally enforceable operational limits of 8400 hrs/yr operation to 8760 hrs/yr operation. This triggers a retro-active PSD applicability review back to the year 2014, when the operational limits were imposed. Table 2 below shows which pollutants would have triggered a PSD review if no operational limits were imposed. Therefore, in addition to the pollutants already identified in Table 1-1 above (PM₁₀/PM_{2.5} and greenhouse gases (GHG) as carbon dioxide equivalent (CO₂e)), NO_x and SO₂ are also included (retro-actively) in this pre-construction monitoring waiver request, as shown in Table 1-2 below.

Table 1-2: PSD Applicability Analysis Both Units Retro-Active for 2014 Project

Pollutant	Past Actuals (tpy)	Proposed Project Annual (tpy)	Proposed Project Increase (tpy)	PSD SER (tpy)	PSD Review Required?
NO _x	77.0	120.0	43.0	40	Yes
CO	10.7	73.1	62.4	100	No
VOC	8.8	12.6	3.8	40	No
SO ₂	6.7	48.3	41.6	40	Yes
H ₂ SO ₄ (mist)	1.03	7.4	6.4	7	No
TSP/PM ₁₀	72.2	85.8	13.6	15	No
PM _{2.5}	72.2	85.8	13.6	10	Yes
CO _{2e}	1,385,260	1,891,328	506,068	75,000	Yes

As stated in NMAC 20.2.74.306.A monitoring requirements:

“Any application for a permit under this part shall contain an analysis of ambient air quality. Air quality data can be that measured by the applicant or that available from a government agency in the area affected by the major stationary source or major modification. The analysis shall contain the following:

- (1) for a major stationary source, each pollutant for which the potential to emit is equal to or greater than the significant emission rates as listed in Table 2 of this part (20.2.74.502 NMAC)”*

As shown in Table 1-1 and 1-2 above, emissions calculations for PM₁₀ and PM_{2.5}, NO₂ and SO₂ show that this project will be above the significant emission rates (SER) listed in NMAC 20.2.74.502 Table 2. Furthermore, NMAC 20.2.74.306.C states:

“Continuous air quality monitoring data shall be required for all pollutants for which a national ambient air quality standard exists. Such data shall be submitted to the department for at least the one (1) year period prior to receipt of the permit application. The department has the discretion to:

- (1) determine that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year but not less than four months; or*
- (2) determine that existing air quality monitoring data is representative of air quality in the affected area and accept such data in lieu of additional monitoring by the applicant.”*

The following report presents justification for the NMED AQB to accept ambient monitoring data collected at the Hobbs Station (Monitor ID 5ZS) as “representative” for PM₁₀ and PM_{2.5} background data for the LPP power plant as defined in 20.2.74.306.C(2) NMAC. To determine

“representativeness” of the Hobbs Monitoring Station ID 5ZS to the proposed LPP project, the following factors are analyzed:

- Surrounding topography, vegetation, and climate;
- Distance from the project site to the proposed monitor and population demographics; and
- Existing surrounding sources.

In addition, proposed air quality concentrations using AERMOD air dispersion modeling for SO₂ and NO_x increases, compared to 20.2.74.503 NMAC Table 3 – Significant Monitoring Concentrations, show that pre-construction monitoring for SO₂ and NO_x may be exempted.

2.0 FACILITY DESCRIPTION

2.1 Facility Identification and Location

The LPP power plant is a 604 MW net output natural gas fired power plant located approximately 8 miles West of Hobbs, NM. From Hobbs travel 7 miles west on Carlsbad Highway and turn north just before mile marker 95. Travel north approximately 1.7 miles and turn west for 0.3 miles. After passing through an access gate, travel 0.5 miles to the LPP site location.

UTM Coordinates (UTM Zone 13) with NAD83 Datum and an Elevation of 3,767 feet above mean sea level:

UTME: 658,413

UTMN: 3,622,425

Latitude / Longitude:

Lat. 32° 43' 47.1"

Long. -103° 18' 34.6"

2.2 Brief Process Description

The LPP power plant operates two advanced firing temperature, Mitsubishi 501F combustion turbine generators (CTGs), each provided with its own heat recovery steam generator (HRSG) including duct burners, a single condensing, reheat steam turbine generator (STG), and an air-cooled condenser serving the STG. The plant generates electricity for sale to Southwestern Public Service Company, its successors or assigns.

The following sources are permitted to operate at the facility:

- Two (2) advanced gas-fired CTGs;
- Two (2) HRSG including duct burners;
- One (1) STG;
- One (1) air cooled condenser serving the STG;
- One (1) firewater pump diesel engine;
- One (1) standby generator diesel engine;
- Three (3) auxiliary cooling towers;
- Three (3) inlet chillers; and
- Three fuel gas heaters.

The proposed emissions increases are emitted through the two CTG stacks. There are no other emissions increases to any other Units or Emission Points proposed.

3.0 PRE-CONSTRUCTION MONITORING WAIVER REQUEST

3.1 LPP Power Plant Surrounding Topography, Vegetation, and Climate

The LPP power plant is located approximately 8 miles West of Hobbs, NM at an elevation of 3,767 feet above mean sea level. The terrain surrounding the power plant is relatively flat with small arroyos, semi-arid rangeland, oil and gas well pads, and a few crop circles. Vegetation is dominated by mesquite, mixed- and desert grassland. Soil cover is composed of caliche rubble and sand.

The climate at the LPP power plant is semi-arid with mild temperatures and low precipitation and humidity. The prevailing winds at the nearby Hobbs Meteorological Monitoring Station No. 722676 (same as Monitoring Station No. 5ZS) for year 2015 are from the south at an annual average wind speed of 3.1 to 5.1 miles per second (mps) (see Figure 3-1 below). Average winter temperature ranges are from the low 30 degrees Fahrenheit (°F) to high 50°F. Average summer temperature ranges are from low 60°F to mid-high 90°F. The average precipitation is about 18 inches. (<https://www.usclimatedata.com/climate/hobbs/new-mexico/united-states/usnm0141>).

3.2 Hobbs, New Mexico

The LPP power plant is located approximately 11 miles West of the Hobbs Monitoring Station ID 5ZS, which is located at 2320 N. Jefferson St., Hobbs, NM (Lat: 32.72666; Lon: -103.123; elevation: 3,634 feet above mean sea level). The area to the East of Hobbs and Monitoring Station 5ZS is mostly covered with vegetation and crop lands. The surrounding topography and the climate in Hobbs, NM and at Monitoring Station 5ZS is the same as described above in section 3.1. Attachment A shows the location of the LPP power plant and Monitoring Station 5ZS.

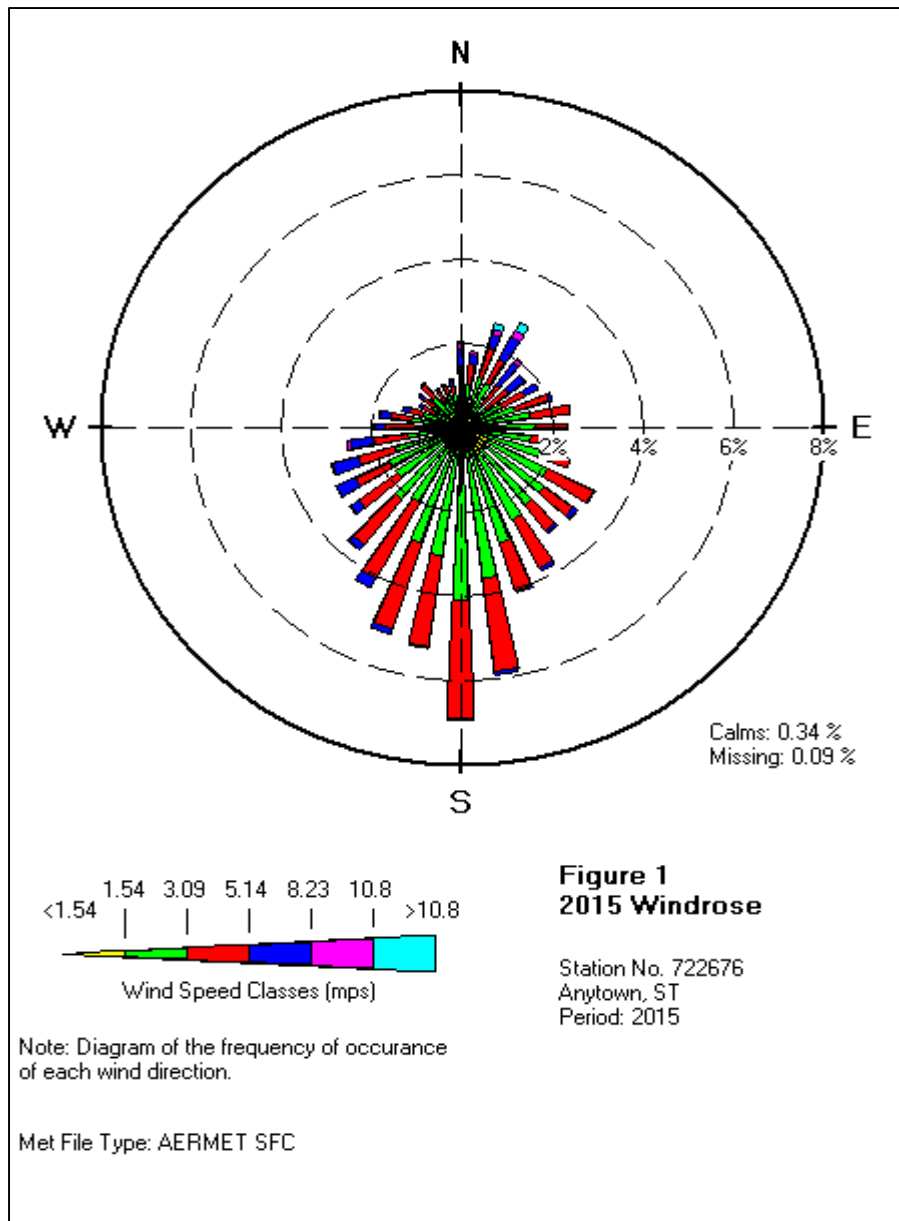


Figure 3-1: Hobbs Station No. 722676 2015 Windrose

3.3 Demographics

Both the city of Hobbs and the LPP power plant are located in Lea County, NM. According to the 2017 census, the population of Lea County is 68,759, (<https://www.census.gov/quickfacts/fact/table/leacountynewmexico/PST045217>) with the majority of the population living in Hobbs at 37,764. (<https://www.census.gov/quickfacts/fact/table/hobbscitynewmexico/PST045216>)

Since the majority of the population is centered around Hobbs and the nearby LPP power plant, the impacts of anthropogenic sources of airborne particulate matter, including PM₁₀ and PM_{2.5}, in and around Hobbs are captured by Monitoring Station No. 5ZS and are representative of the LPP power plant's location.

3.4 Existing Surrounding Sources

Regulated sources of particulate matter emissions in Lea County and neighboring Eddy County consist mostly of oil and gas operations, potash mining and processing, and portable construction sources. A majority of the sources are located to the West of Hobbs and around the LPP power plant. Surrounding source data and background concentrations for PM₁₀ and PM_{2.5} (see Table 3-1 below) as applicable will be applied. The NMED AQB Air Dispersion Modeling Guidelines (Revised August 8, 2017) will be followed for the required air dispersion modeling portion of this project, which includes modeling the facility's PM₁₀ and PM_{2.5} including nearby sources and adding a background concentration to that. Note that the current NMED AQB Air Dispersion Modeling Guidelines recommend using background data for sources located in the Eastern part of New Mexico from Monitoring Station No. 5ZS.

3.5 Modeled NO_x and SO₂ Concentrations

Per Table 3 of 2.2.74.503 NMAC, SO₂ concentrations from emissions increases are based on the 24-hour averaging time. Normally, the short term emission rate increase (lb/hr SO₂ increase) would be modeled and compared against the limit. This project does not request to increase the currently permitted short term SO₂ emissions rate. However, the annual (tpy) SO₂ emission rate is proposed to increase. Therefore, the long term SO₂ emission increase was modeled based on the 24-hour averaging time and compared against the Table 3 limit.

The annual emission rate increase (tpy) for NO_x was modeled and compared against the annual averaging time limit in Table 3. Please note that a complete air dispersion modeling report was submitted to NMED with the initial permit modification application. A detailed description of the modeling parameters used is included in the modeling report.

Table 3-1: New Mexico/National Ambient Air Quality Standards

Criteria Pollutant	Averaging Period	NAAQS ug/m ³	NMAAQS ug/m ³	Proposed Background Concentrations	Proposed Monitoring Station/location/Data
PM _{2.5}	Annual	12	---	5.81	ID: 5ZS, 350250008 Hobbs-Jefferson: 2320 N. Jefferson St., Hobbs
	24-hour	35	---	27.77 (17.37*)	
PM ₁₀	Annual	---	---	21.28	ID: 5ZS, 350250008 Hobbs-Jefferson: 2320 N. Jefferson St., Hobbs
	24-hour	150	150	101.50 (38.50**)	
TSP	7-day	---	110	---	---
	30-da	---	90	---	---
	Annual	---	60	21.28	ID: 5ZS, 350250008 Hobbs-Jefferson: 2320 N. Jefferson St., Hobbs
	24-hour	---	150	101.50 (38.50**)	

Notes:

TSP: There are no TSP monitors in New Mexico. TSP background concentrations are equal to PM₁₀ concentrations for the same averaging period.

Alliant Environmental already requested and received surrounding source data from the NMED modeling section.

Table 3-2 Project Emission Rate Increases

Units	Criteria Pollutant	Permitted Rates		Proposed Rates (tpy)	Modeled Rates for Comparison		Comments
		(lb/hr) ¹	(tpy) ²		(lb/hr)	(tpy)	
Hobbs-1 + DB-1 and Hobbs-2 + DB-2	NO ₂	193.2	181.0	190.1	0.00	9.10	Modeled 4.55 tpy increase for each unit to compare to annual SIL. No change in permitted and proposed lb/hr; therefore 1-hr NO ₂ was not modeled since previous model should compliance with NAAQS.
	SO ₂	10.7	48.2	53.3	0.00	5.10	Modeled 2.55 tpy increase for each unit to compare to annual SIL. No change in permitted and proposed lb/hr; therefore 1-hr SO ₂ was not modeled since previous model should compliance with NAAQS.

Notes:

¹ (lb/hr) each turbine + duct burner

² (tpy) combined both turbines + duct burners

Table 3-3 Results

Units	Criteria Pollutant	Averaging Period	Table 3 Limit (ug/m ³)	GLC _{max} (ug/m ³)	GLC _{max} from Project Impact <Table 3 Limit? (ug/m ³)
Hobbs-1 + DB-1 and Hobbs-2 + DB-2	NO ₂	Annual	14	0.014	Yes
	SO ₂	24-hour	13	0.047	Yes

Note:

All modeled GLC_{max} concentrations for Table 3 comparison is highest met data year's high 1st high.

4.0 CONCLUSION

A waiver from the NMED AQB from performing pre-construction monitoring for PM₁₀ and PM_{2.5}, NO_x and SO₂ is justified, because the PM data collected from Monitor Station ID 5ZS provides representative ambient air background data as required by regulation 20.2.74.306.A NMAC and the modeled proposed project increases for NO_x and SO₂ show that the predicted concentrations are below the 20.2.74.503 NMAC Table 3 limits. The PM monitoring station is located 11 miles East from existing LPP power plant. To determine “representativeness” of the Hobbs Monitoring Station ID 5ZS to the LPP power plant, the following factors were analyzed:

- Surrounding topography, vegetation, and climate;
- Distance from the project site to the proposed monitor and population demographics; and
- Existing surrounding sources.

The LPP power plant is located only 11 miles West of the proposed Monitoring Station 5ZS. The terrain, vegetation and climate are virtually the same for both locations. This close proximity of the monitoring station to the LPP power plant would predict ambient concentrations due to large range transport of particulate matter to be identical.

Hobbs, NM is the largest city in Lea County with greater than 50% of the county’s population. Anthropogenic sources of airborne particulate matter found in Hobbs resulting from human activity include:

- Vehicle traffic
- Combustion particulate matter from heating homes, boilers, etc.
- Agriculture and local businesses


The proposed project at the LPP power plant exceeds the SER of 15 tons per year (tpy) for PM₁₀ and 10tpy for PM_{2.5} for direct PM_{2.5}. Monitoring Station No. 5ZS, located in Hobbs, NM, provides background concentrations that are representative for use as background for the proposed permit modeling analysis. The modeled concentrations for the proposed NO_x and SO₂ project emissions increases show that the predicted impacts are lower than the significant monitoring concentrations shown in Table 3 of 20.2.74.503 NMAC.

LPP kindly requests a waiver from performing pre-construction monitoring for PM₁₀, PM_{2.5}, NO_x and SO₂.

Attachment A

Area Map Showing LPP Power Plant and Monitoring Station 5ZS



		Area Map: LPP Power Plant And Monitor Station 5ZS		LPP Power Plant Hobbs, NM	
Property Line: ——— Fence Line: - - - - Flow: Acreage: 40	Drawn by: MRS Chk'd by:	Date: 05/29/18 Date:	LPP Power Plant N 32° 43' 47.1" Latitude W -103° 18' 34.6" Longitude		Project No.: 085-002
			File Name: Area Map		Figure: A-1