TCEQ Interoffice Memorandum

To: Ariel Ramirez
Mechanical/Coatings Section

Thru: Chad Dumas, Team Leader
Air Dispersion Modeling Team (ADMT)

From: Jessica Borne and Kevin Tang
ADMT

Date: May 8, 2025

Subject: Air Quality Analysis Audit – Southwestern Electric Power Company (RN100214287)

1. Project Identification Information

Permit Application Number: 178948
New Source Review (NSR) Project Number: 387979
ADMT Project Number: 9742
County: Harrison

Air Quality Analysis: Submitted by Trinity Consultants, April 2025, on behalf of Southwestern Electric Power Company. Additional information was provided April 2025 and May 2025.

2. Report Summary

The air quality analysis (AQA) is acceptable for all review types and pollutants. The results are summarized below.

A. Minor NSR and Air Toxics Analysis

Table 1. Site-Wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax[1] ($\mu g/m^3$)	Standard ($\mu g/m^3$)
SO_2	1-hr	0.6	1021
H_2SO_4	1-hr	0.07	50
H_2SO_4	24-hr	0.02	15

[1] Ground level maximum concentration

Table 2. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	0.6	7.8
PM_{10}	24-hr	0.6	5
$PM_{2.5}$	24-hr	0.3	1.2
$PM_{2.5}$	Annual	0.01	0.13
NO_2	1-hr	12	7.5
NO_2	Annual	0.1	1
CO	1-hr	275	2000
CO	8-hr	79	500

The GLCmax are the maximum predicted concentrations associated with one year of meteorological data.

EPA intermittent guidance was relied on for the 1-hr NO_2 De Minimis analysis. Refer to the Modeling Emissions Inventory section for details.

EPA revised the secondary SO_2 National Ambient Air Quality Standard (NAAQS) from a 3-hr average to an annual average effective January 27, 2025. The applicant did not address this revision in the AQA. ADMT reviewed the proposed project and determined EPA's alternative demonstration approach summarized in a memorandum dated December 10, 2024, with a subject "Alternative Demonstration Approach for the 2024 Secondary Sulfur Dioxide National Ambient Air Quality Standard under the Prevention of Significant Deterioration Program", satisfies the annual average compliance requirement.

The justification for selecting EPA's interim 1-hr NO_2 and 1-hr SO_2 De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO_2 and 1-hr SO_2 De Minimis levels. As explained in EPA guidance memoranda[2,3], EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO_2 and 1-hr SO_2 NAAQS.

The $PM_{2.5}$ De Minimis levels are EPA recommended De Minimis levels. The use of EPA recommended De Minimis levels is sufficient to conclude that a proposed

[2] www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf
[3] www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf

source will not cause or contribute to a violation of a $PM_{2.5}$ NAAQS based on the analyses documented in EPA guidance and policy memorandums[4].

To evaluate secondary $PM_{2.5}$ impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with EPA's Guideline on Air Quality Models. Specifically, the applicant used a Tier 1 demonstration tool developed by EPA referred to as Modeled Emission Rates for Precursors (MERPs). The basic idea behind MERPs is to use technically credible air quality modeling to relate precursor emissions and peak secondary pollutants impacts from a source. Using data associated with the worst-case source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.12635 µg/m^3 and 0.00522 µg/m^3, respectively. When these estimates are added to the GLCmax listed in the table above, the results are less than the De Minimis levels.

Table 3. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m^3)	Background (µg/m^3)	Total Conc. = [Background + GLCmax] (µg/m^3)	Standard (µg/m^3)
NO_2	1-hr	12	34	46	188

The GLCmax is the maximum predicted concentration associated with one year of meteorological data.

EPA intermittent guidance was relied on for the 1-hr NO_2 NAAQS analysis. Refer to the Modeling Emissions Inventory section for details.

A background concentration for NO_2 was obtained from EPA AIRS monitor 481830001 at Gregg Co Airport Near Longview, Longview, Gregg County. The applicant used a three-year average (2021-2023) of the 98th percentile of the annual distribution of daily maximum 1-hr concentrations for the 1-hr value. Additionally, ADMT reviewed the 1-hr calculations using the most recent year of available data (2024) and determined overall conclusions remain the same. The use of this monitor is reasonable based on the applicant's land use comparison and quantitative review of emission sources in the surrounding area of the monitor site relative to the project site.

[4] www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html

Table 4. Generic Modeling Results (Worst-Case Turbine Operating Load)

Source ID	1-hr GLCmax (µg/m³ per lb/hr)	8-hr GLCmax (µg/m³ per lb/hr)	24-hr GLCmax (µg/m³ per lb/hr)	Annual GLCmax (µg/m³ per lb/hr)
100	0.032	0.019	0.01	0.0005
80	0.041	0.022	0.01	0.0006
MECL	0.05	0.027	0.02	0.0007

Table 5. Generic Modeling Results

Source ID	1-hr GLCmax (µg/m³ per lb/hr)	Annual GLCmax (µg/m³ per lb/hr)
LOV1	135.55	1.91
LOV2	143.71	1.75
ILE1	162.74	2.14
ILE2	162.14	1.97
NGFUG1	331.11	3.15
NGFUG2	282.61	3.04

Table 6. Minor NSR Project (Increases Only) Modeling Results for Health Effects

Pollutant	CAS#[5]	Averaging Time	GLCmax (µg/m³)	10% ESL[6] (µg/m³)
C15-30 petroleum lubricating oils, hydrotreated neutral oil-based	72623-86-0	1-hr	25	100
n-hexane	110-54-3	1-hr	240	560
n-hexane	110-54-3	Annual	0.15	20

[5] Chemical Abstract Service Number
[6] Effects Screening Level

3. Model Used and Modeling Techniques

AERMOD version 23132 was used for the NO_2 and CO analyses. Additionally, version 23132 was used in the generic modeling to determine the worst-case stack parameters for the turbines (source IDs CT1 and CT2). AERMOD version 24142 was used in a refined screening mode for all other analyses. ADMT determined that the discrepancy would not affect overall modeling conclusions.

For the health effects analysis, a unitized emission rate of 1 lb/hr was used to predict a generic short-term and long-term impact for each source. The generic impact was multiplied by the proposed pollutant specific emission rates to calculate a maximum predicted concentration for each source. The maximum predicted concentration for each source was summed to get a total predicted concentration for each pollutant. The total predicted concentrations were compared to 10 percent of their respective ESLs (Step 3 of the Modeling and Effects Review Applicability guidance). All pollutants fell out by Step 3 as reported in Table 6.

The applicant conducted the 1-hr and annual NO_2 NAAQS analyses using the Ambient Ratio Method - 2 model option following EPA guidance.

The applicant conducted generic modeling representing three operating scenarios for the turbines (source IDs CT1 and CT2) based on 100% load, 80% load, and the minimum emission compliant load (source IDs 100, 80, and MECL), as reported in Table 4. The parameters for the worst-case scenario, MECL, were used to represent the turbines for all other analyses.

For the CO and 1-hr NO_2 analyses, the applicant modeled separate routine (“Normal”) and MSS (“MSS”) scenarios for the turbines. According to the applicant, the turbines cannot operate simultaneously in these two scenarios. Therefore, the worst-case scenario between the Normal (source IDs CT1 and CT2) and MSS (source IDs CT1_MSS and CT2_MSS) turbine operations was selected for the applicable analyses.

For all other analyses, the routine scenario was modeled (excluding source IDs CT1_MSS and CT2_MSS) as the maximum allowable emissions are the equivalent between the two scenarios.

A. Land Use

Medium roughness and elevated terrain were used in the modeling analysis. These selections are consistent with the AERSURFACE analysis, topographic map, digital elevation models, and aerial photography. The selection of medium roughness is reasonable.

B. Meteorological Data

Surface Station and ID: Longview, TX (Station #: 3901)
Upper Air Station and ID: Shreveport, LA (Station #: 13957)
Meteorological Dataset: 2020
Profile Base Elevation: 113.7 meters

C. Receptor Grid

The grid modeled was sufficient in density and spatial coverage to capture representative maximum ground-level concentrations.

D. Building Wake Effects (Downwash)

Input data to Building Profile Input Program Prime (BPIP-PRIME) (Version 04274) are generally consistent with the aerial photography, plot plan, and modeling report.

The release height for source IDs ILE1, ILE2, LOV1, and LOV2 is inconsistent between the AERMOD and BPIP-PRIME input files. However, ADMT conducted test modeling and determined that overall conclusions do not change

4. Modeling Emissions Inventory

The modeled emission point source parameters and rates were consistent with the modeling report. The source characterizations used to represent the sources were appropriate.

As noted in section 3, the applicant conducted generic modeling representing three operating scenarios for the turbines (source IDs CT1 and CT2) based on 100% load, 80% load, and the minimum emission compliant load (source IDs 100, 80, and MECL). For each model group, the two turbines were each modeled at a 0.5 lb/hr emission rate.

For the 1-hr NO_2 De Minimis and NAAQS analyses, emissions from the emergency engine (EPN EMGEN) were modeled with an annual average emission rate, consistent with EPA guidance for evaluating intermittent emissions. Emissions from the emergency engine were represented to occur for no more than 100 hours per year.

Except as noted above, maximum allowable hourly emission rates were used for the short-term averaging time analyses, and annual average emission rates were used for the annual averaging time analyses.