

# TCEQ Interoffice Memorandum

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Mechanical/Coatings Section

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

From: Bipin Sharma  
ADMT

Date: March 12, 2025

**Subject: Air Quality Analysis Audit - Hendrix Industries, Inc. (RN11071411)**

## Project Identification Information

Permit Application Number: 161972  
New Source Review (NSR) Project Number: 380892  
ADMT Project Number: 9616  
County: Austin

Air Quality Analysis: Submitted by Edge Engineering and Science, LLC, October 2024, on behalf of Hendrix Industries, Inc. Additional modeling submitted March 2025.

## Report Summary

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

This is an as-built amendment to NSR Project 318104. This analysis updates the permit application representations and emission rates to reflect the construction of an additional baghouse (EPN: BH-2) and four silos emitting via the existing baghouse (EPN: BH-1). The applicant evaluated the project the same as the original submittal but incorporated the as-built changes associated with this project.

### A. Minor NSR and Air Toxics Analysis

**Table 1. Project-Related Modeling Results for State Property Line**

Pollutant	Averaging Time	GLCmax <sup>1</sup> (µg/m <sup>3</sup> )	De Minimis (µg/m <sup>3</sup> )
SO <sub>2</sub>	1-hr	0.28	20.42

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<sup>1</sup> Ground level maximum concentration

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**Table 2. Modeling Results for Minor NSR De Minimis**

Pollutant	Averaging Time	GLCmax ( $\mu\text{g}/\text{m}^3$ )	De Minimis ( $\mu\text{g}/\text{m}^3$ )
SO <sub>2</sub>	1-hr	0.28	7.8
PM <sub>10</sub>	24-hr	0.89	5
PM <sub>2.5</sub>	24-hr	0.89	1.2
PM <sub>2.5</sub>	Annual	0.28	0.13
CO	1-hr	38.84	2000
CO	8-hr	17.25	500
NO <sub>2</sub>	1-hr	46.24*	7.5
NO <sub>2</sub>	Annual	3.47*	1

\*GLCmax values are the model output results. Though the values are different than that reported in the EMEW, it does not change the overall conclusions.

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

EPA revised the secondary SO<sub>2</sub> 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<sub>2</sub> and 1-hr SO<sub>2</sub> De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO<sub>2</sub> and 1-hr SO<sub>2</sub> De Minimis levels. As explained in EPA guidance memoranda<sup>2,3</sup>, EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO<sub>2</sub> and 1-hr SO<sub>2</sub> NAAQS.

The PM<sub>2.5</sub> De Minimis levels are EPA recommended De Minimis levels. The use of EPA recommended De Minimis levels is sufficient to conclude that a proposed

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<sup>2</sup> [www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf](http://www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf)

<sup>3</sup> [www.tceq.texas.gov/assets/public/permitting/air/memos/guidance\\_1hr\\_no2naaqs.pdf](http://www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf)

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source will not cause or contribute to a violation of a PM<sub>2.5</sub> NAAQS based on the analyses documented in EPA guidance and policy memorandums<sup>4</sup>.

To evaluate secondary PM<sub>2.5</sub> impacts, ADMT supplemented an analysis based on a Tier 1 demonstration approach consistent with EPA's Guideline on Air Quality Models (GAQM). Specifically, ADMT 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 hypothetical source, ADMT estimated 24-hr and annual secondary PM<sub>2.5</sub> concentrations of 0.00148 µg/m<sup>3</sup> and 0.00006 µg/m<sup>3</sup>, respectively. Since the combined direct and secondary annual PM<sub>2.5</sub> impacts are above the De Minimis level, a full impacts analysis is required.

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

Pollutant	Averaging Time	GLCmax (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	Total Conc. = [Background + GLCmax] (µg/m <sup>3</sup> )	Standard (µg/m <sup>3</sup> )
PM <sub>2.5</sub>	Annual	0.3	7.9	8.2	9
NO <sub>2</sub>	1-hr	50*	88	138	188
NO <sub>2</sub>	Annual	4	20	24	100

\*The GLCmax value is the model output result. Though the value is different than that reported in the EMEW, it does not change the overall conclusions.

The annual PM<sub>2.5</sub> GLCmax is the highest five-year average of the annual predicted concentrations determined for each receptor.

The 1-hr and annual NO<sub>2</sub> GLCmax are the maximum predicted concentrations associated with five years of meteorological data.

A background concentration for PM<sub>2.5</sub> was obtained from the EPA AIRS monitor 480411086 located at 3670 Finfeather Road, Brazos County. A three-year average (2021 – 2023) of the annual concentrations was used for the annual value. The use of the monitor is reasonable based on the applicant's review of land use, county population, county emissions, and a quantitative review of emissions surrounding the area of the monitor site relative to the project site.

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<sup>4</sup> [www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html](http://www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html)

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Background concentrations for NO<sub>2</sub> were obtained from the EPA AIRS monitor 482011066 located at 5617 Westward Ave., Houston, Harris County. The applicant determined the three-year average (2021 – 2023) of the 98th percentile of the annual distribution of the daily maximum 1-hr concentrations for the 1-hr value. The annual mean concentration from 2023 was used for the annual value. The applicant did not convert the background concentrations from parts per billion (ppb) to µg/m<sup>3</sup>. ADMT converted the monitored concentration units using the appropriate factor and reported the concentrations in Table 3. The use of the monitor is reasonable based on the applicant's review of land use, county population, county emissions, and a quantitative review of emissions surrounding the area of the monitor site relative to the project site.

As stated above, to evaluate secondary PM<sub>2.5</sub> impacts, ADMT supplemented an analysis based on a Tier 1 demonstration approach consistent with EPA's GAQM. Specifically, ADMT used a Tier 1 demonstration tool developed by EPA referred to as MERPs. Using data associated with the worst-case hypothetical source, the ADMT estimated an annual secondary PM<sub>2.5</sub> concentration of 0.00006 µg/m<sup>3</sup>. When this estimate is added to the GLCmax listed in Table 3 above, the result is less than the NAAQS.

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**Table 4. Minor NSR Site-Wide Modeling Results for Health Effects**

Pollutant	CAS#	Averaging Time	GLCmax ( $\mu\text{g}/\text{m}^3$ )	GLCmax Location	GLCni <sup>5</sup> ( $\mu\text{g}/\text{m}^3$ )	GLCni Location	ESL ( $\mu\text{g}/\text{m}^3$ )
Styrene	100-42-5	1-hr	168	W Property Line	40	Approx. 23m NE	110
Styrene	100-42-5	Annual	5	-	-	-	140
Acetone	67-64-1	1-hr	76	-	-	-	7800
Titanium (IV) dioxide	13463-67-7	1-hr	0.004	-	-	-	50
Aluminum hydroxide	21645-51-2	1-hr	0.0002	-	-	-	50
silica, amorphous (synthetic amorphous)	7631-86-9	1-hr	0.0002	-	-	-	27
silica, amorphous (synthetic amorphous)	7631-86-9	Annual	0.00001	-	-	-	2
Silica, crystalline (Cristobalite)	14464-46-1	1-hr	1.2	-	-	-	14
Silica, crystalline (Cristobalite)	14464-46-1	Annual	0.08	W Property Line	0.02	Approx. 29m SW	0.27
Silica, crystalline (quartz)	14808-16-7	1-hr	1.2	-	-	-	14
Silica, crystalline (quartz)	14808-16-7	Annual	0.08	W Property Line	0.02	Approx. 29m SW	0.27

<sup>5</sup> Ground level non-industrial concentration

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## 1. Model Used and Modeling Techniques

AERMOD (Version 24142) was used in a refined screening mode.

### A. Land Use

Low 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 low roughness is reasonable.

### B. Meteorological Data

Surface Station and ID: College Station, TX (Station #: 3904)

Upper Air Station and ID: Corpus Christi, TX (Station #: 12924)

Meteorological Dataset: 2017 – 2021 for full NAAQS analysis, 2020 for all other analyses

Profile Base Elevation: 100 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 (Version 04274) are consistent with the aerial photography, plot plan, and modeling report.

## 2. Modeling Emissions Inventory

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

The applicant assumed full conversion of NO<sub>x</sub> to NO<sub>2</sub>, which is conservative.

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.