

TCEQ Interoffice Memorandum

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Mechanical/Coatings Section

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

From: Sara Hill
ADMT

Date: October 9, 2024

Subject: Air Quality Analysis Audit - Texas Materials Group, Inc. (RN106802838)

1. Project Identification Information

Permit Application Number: 176847

New Source Review (NSR) Project Number: 376235

ADMT Project Number: 9438

County: Shelby

Air Quality Analysis: Submitted by Elm Creek Environmental, LLC, September 2024, on behalf of Texas Materials Group, Inc. Additional information provided October 2024.

2. Report Summary

The air quality analysis 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 (µg/m ³)	Standard (µg/m ³)
SO ₂	1-hr	18	1021

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	18	7.8
SO ₂	3-hr	12	25
PM ₁₀	24-hr	16	5

¹ Ground level maximum concentration

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Pollutant	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	De Minimis ($\mu\text{g}/\text{m}^3$)
PM _{2.5}	24-hr	16	1.2
PM _{2.5}	Annual	0.38	0.13
NO ₂	1-hr	31	7.5
NO ₂	Annual	2	1
CO	1-hr	237	2000
CO	8-hr	95	500

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

The justification for selecting EPA's interim 1-hr NO₂ and 1-hr SO₂ De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO₂ and 1-hr SO₂ 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 NO₂ and 1-hr SO₂ National Ambient Air Quality Standards (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 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 memorandums⁴.

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 (GAQM). 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 0.029 $\mu\text{g}/\text{m}^3$ and 0.001 $\mu\text{g}/\text{m}^3$, respectively. When these estimates are added to the GLCmax listed in the table above, the results are greater than the De Minimis levels. Since the combined direct and secondary 24-hr and annual PM_{2.5} impacts are above the De minimis levels, a full impacts analysis is required.

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

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

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

Pollutant	Averaging Time	GLCmax (µg/m³)	Background (µg/m³)	Total Conc. = [Background + GLCmax] (µg/m³)	Standard (µg/m³)
SO ₂	1-hr	18	60	78	196
PM ₁₀	24-hr	16	105	121	150
PM _{2.5}	24-hr	15.6	19	34.6	35
PM _{2.5}	Annual	0.4	8.3	8.7	9
Pb	3-mo	0.0003	0.07	0.0703	0.15
NO ₂	1-hr	31	59	90	188
NO ₂	Annual	2	11	13	100

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

A background concentration for SO₂ was obtained from EPA AIRS monitor 481830001 located at Gregg Co Airport Near Longview, Gregg County. The three-year average (2021-2023) of the 99th percentile of the annual distribution of the maximum daily 1-hr concentrations was used for the 1-hr value. Use of this monitor is reasonable based on a quantitative review of emissions surrounding the monitor site relative to the project site, land use, and regional considerations.

A background concentration for PM₁₀ was obtained from EPA AIRS monitor 482450628 at 6956 James Gamble Drive, Port Arthur, Jefferson County. The applicant used the high second high 24-hr concentration of three years (2021-2023) for the 24-hr value. Use of this monitor is reasonable based on a quantitative review of emissions surrounding the monitor site relative to the project site, county population, county emissions, land use, and regional considerations.

Background concentrations for PM_{2.5} were obtained from EPA AIRS monitor 483611100 at Texas Highway 62 and 12, West Orange, Orange County. The applicant calculated a three-year average (2021-2023) of the 98th percentile of the annual distribution of the 24-hr concentrations for the 24-hr value and a three-year average (2021-2023) of the annual average concentrations for the annual value. Use of this monitor is reasonable based on county population, county emissions, land use, and regional considerations. Additionally, the monitor is sited closer to and downwind from a more industrialized region of the state than the project site.

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Background concentrations for NO₂ were obtained from the EPA AIRS monitor 482450009 located at 1086 Vermont Ave., Beaumont, Jefferson County. The applicant calculated a 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. Use of this monitor is reasonable based on a quantitative review of emissions surrounding the monitor site relative to the project site, county population, county emissions, land use, and regional considerations.

A background concentration for Pb was obtained from the EPA AIRS monitor 480850029 located at 7202 Stonebrook Parkway, Frisco, Collin County. The highest 3-month rolling average from 2021-2023 was used for the 3-month value. Use of this monitor is reasonable based on a quantitative review of emissions surrounding the monitor site relative to the project site, county population, county emissions, land use, and regional considerations.

As stated above, to evaluate secondary PM_{2.5} impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with EPA's GAQM. Specifically, the applicant used a Tier 1 demonstration tool developed by EPA referred to as MERPs. Using data associated with the worst-case source, the applicant estimated 24-hr and annual secondary PM_{2.5} concentrations of 0.029 µg/m³ and 0.001 µg/m³, respectively. When these estimates are added to the GLCmax listed in Table 3 above, the results are less than the NAAQS.

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

Pollutant	CAS#⁵	Averaging Time	GLCmax (µg/m³)	GLCmax Location	ESL⁶ (µg/m³)
asphalt (vapor)	8052-42-4 (Vapor)	1-hr	686	N property line	350
asphalt (vapor)	8052-42-4 (Vapor)	Annual	12	N property line	35
asphalt (PM)	8052-42-4 (PM)	1-hr	4	N property line	5
diesel fuel	68334-30-5	1-hr	1006	116 m SE	1000
diesel fuel	68334-30-5	Annual	25	637 m N	100

⁵ Chemical Abstract Service Number

⁶ Effects Screening Level

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Table 5. Minor NSR Hours of Exceedance for Health Effects

Pollutant	Averaging Time	1 X ESL GLCni⁷
asphalt (vapor)	1-hr	23
diesel fuel	1-hr	1

The GLCmax and the GLCni locations are listed in Table 4 above. The locations are listed by their approximate distance and direction from the property line of the project site. The applicant treated the GLCmax as the GLCni.

3. Model Used and Modeling Techniques

ISC-PRIME (Version 04272) was used.

A. Land Use

Rural dispersion coefficients and elevated terrain were used in the modeling analysis. These selections are consistent with digital elevation models and aerial photography.

B. Meteorological Data

Surface Station and ID: Shreveport, LA (Station #: 13957)
Upper Air Station and ID: Longview, TX (Station #: 3951)
Meteorological Dataset: 1989
Anemometer Height: 10 meters

C. Receptor Grid

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

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.

4. Modeling Emissions Inventory

⁷ Ground level non-industrial concentration

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

A NO_x to NO₂ conversion factor of 0.9, based on Ambient Ratio Method - 2, was applied to the modeled annual and 1-hr NO_x emission rates. This is reasonable.

A fugitive adjustment factor of 0.6 was applied to the modeled emission rates of applicable sources, which is consistent with TCEQ guidance for these types of sources.

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.