Preliminary Determination Summary

Lhoist North America of Texas, LLC
Permit Numbers 4335A, PSDTX31M2, and GHGPSDTX235

I. Applicant

Lhoist North America of Texas LLC
PO Box 473
Clifton, TX 76634-0473

II. Project Location

Lime Manufacturing Plant
2.7 miles west from the intersection of FM 2602 and State HWY 6
Bosque County
Clifton, Texas 76634

III. Project Description

The Applicant has requested authorization of two additional kilns (natural gas fired vertical kiln units) and associated material handling facilities.

IV. Emissions

Air Contaminant	Proposed Allowable Emission Rates (tpy)
PM	286.64
PM_{10}	271.12
$PM_{2.5}$	125.49
VOC	9.57
NO_X	1088.65
CO	519.10
SO_2	1369.87
HCl	25.96
CO2e	647,309 (project increase)

CO2e - carbon dioxide equivalents based on global warming potentials of CH4 = 25, N2O = 298, SF6=22,800.

V. Federal Applicability

The following chart illustrates the annual project emissions for each pollutant and whether this pollutant triggers PSD or Nonattainment (NA) review.

Bosque County is in attainment or unclassified for all pollutants. Therefore, nonattainment review is not applicable.

This site is a major source. Project increases were determined using an actual-to-potential applicability test. The baseline actual emissions of new units are assumed to be zero and affected

sources are included. PSD review applies to the following pollutants for which the PTE exceeds an applicable significance threshold (40 CFR § 52.21(b)(23)(i)). The plant has a PTE in excess of 100 tpy (mass basis) and 75,000 tpy GHG (CO2e basis) for GHG. GHG are therefore subject to regulation (40 CFR § 52.21(b)(49)(iv)).

Pollutant	Project Emissions (tpy)	Major Mod Trigger (tpy)	PSD Triggered Y/N
VOC	5.68	25 for NA 40 for PSD	N
NO_x	102.20	25 for NA 40 for PSD	Y
SO_2	50	40	Y
CO	189.80	100	Y
PM	91.67	25	Y
PM_{10}	82.26	15	Y
$PM_{2.5}$	49.28	10	Y

The proposed project triggers PSD review for non-GHG NSR regulated pollutants. As shown in the table below, because the project increase is more than 75,000 tpy of CO2e, PSD review is triggered for GHG emissions.

Pollutant	Project Emissions (tpy)	Major Source or Major Mod Trigger Level (tpy)	PSD Triggered Y/N
CO2e	647,309	75,000	Y

Hydrogen chloride (a byproduct of lime production) emissions were subject to a minor NSR and air toxics review.

VI. Control Technology Review

Best Available Control Technology

Source Name	EPN(s)	Best Available Control Technology Description
Crushers *(existing)*	CRUSH1, RC1	**PM:** 70% reduction due to the use of water sprays/wetted material
Screens *(existing)*	SCREEN1, , K4-VS1, K5-VS1, VS-1, VS-4	**PM:** 85% - partial enclosure (SCREEN1, K4-VS1, K5-VS1) 70% - water sprays (VS-1, VS-4)

Material Handling	FUG-1, FUG-2	**PM:** 85% - enclosure
Stockpiles	K45PILES	**PM:** 70% reduction due to the use of water sprays/wetted material as necessary.
Kilns 4 and 5	K4-0, K5-0	**PM:** Baghouse - 0.009 gr/dscf PM/PM_{10}, 0.0044 gr/dscf $PM_{2.5}$ **Products of combustion:** Vertical Parallel Flow Regenerative ("PFR") Kiln Design, Good Combustion, and Process Control Techniques **NO_x**:0.35 lb/ton of lime (3-hr average) **CO**: 0.69 lb/ton of lime (3-hr average) **VOC**: 5.5 lb VOC/MM scf fuel **SO_2**: 5 gr/ 100 scf of fuel **HCl**: 0.035 lb/ton of lime (3-hr average) **CO2**: 3.61 MMBtu (HHV)/ton-lime Startup and shutdown emissions are expected to be lower than normal operational emissions.
Kiln 2 Lime Kiln Dust ("LKD") Pugmill (SP incorporation)	TR-1, STOCK4	**PM:** 70% reduction due to the use of water sprays/wetted material as necessary.
Loadout Dust Collector Replacement (SP incorporation)	DC-10A	**PM:** Baghouse - 0.005 gr/dscf
Lime Product Hammer Mill and Silo (PBR incorporation)	EPN DC-10A, DC-1692	**PM:** Baghouse - 0.005 gr/dscf (EPN DC-10A) and **PM:** Baghouse/bin vent **-** 0.005 gr/dscf (EPN DC-1692)
Product Loadout Fugitives at Silos 1-6 and ROK Silo A	K45LDFUG, FLXLDFUG, K45KPLDFUG	**PM:** Extendable loading spouts are proposed, aspirated to a baghouse. This results in a represented 90% capture (and reduction) in PM emissions. The captured emissions are controlled by the below baghouses.
Product Loadout Dust Collectors: LHP-Pebble Loadout Spout Dust Collector LHP-Fine 2 Loadout Spout Dust Collector LHP-Fine 3 Loadout Spout Dust Collector LHP-ROK Loadout Spout Dust Collector LHP-Fine 4 Loadout Spout Dust Collector LHP-Fine 5 Loadout Spout Dust Collector LHP Fine 6 Loadout Spout Dust Collector	LHP-DC8 LHP-DC9 LHP-DC10 LHP-DC11 LHP-DC20 LHP-DC21 LHP-DC22	**PM:** 99% reduction in captured loadout emissions (conservative estimation – emissions calculated based on reduction of material handling emissions rather than outlet grain loading)

New screens: LHP-Secondary Screen Circuit 1 LHP-Primary Screen Circuit 1	 LHP-DC1 LHP-DC2	**PM:** Baghouse - 0.005 gr/dscf
New Crusher: LHP-Tertiary Crusher Circuit 1	 LHP-DC5	**PM:** Baghouse - 0.005 gr/dscf
New material handling and processing: LHP-ROK A Reclaim LHP-Pebble Silo Reclaim LHP Fine Silo 2 Top LHP-ROK Silo A Top LHP-Fine Drag Circuit 2 LHP-Primary Screen Circuit 2 LHP-Feed Secondary Crusher Circuit 2 LHP-ROK B LHP-Secondary Screen Circuit 2 LHP-ROK Silo B Top LHP-Fine Silo 4 Top LHP-Fine Silo 6 Top Kiln 4 – Shaft 1 Discharge – Belt 1 Kiln 4 – Shaft 2 Discharge – Belt 1 Kiln 4 – Shaft 1 Discharge – Belt 2 Kiln 4 – Shaft 2 Discharge – Belt 2 Kiln 5 – Shaft 1 Discharge – Belt 1 Kiln 5 – Shaft 2 Discharge – Belt 1 Kiln 5 – Shaft 1 Discharge – Belt 2 Kiln 5 – Shaft 2 Discharge – Belt 2 Gypsum Bin Vent Gypsum Spout Flex Kiln – Dump Hopper Flex Kiln – Belt Discharge	 LHP-DC3 LHP-DC4 LHP-DC6 LHP-DC7 LHP-DC12 LHP-DC13 LHP-DC14 LHP-DC15 LHP-DC16 LHP-DC17 LHP-DC18 LHP-DC19 K4-1 K4-2 K4-3 K4-4 K5-1 K5-2 K5-3 K5-4 G-1 G-2 F-1 F-2	**PM:** Baghouse - 0.005 gr/dscf

VII. Air Quality Analysis

The Applicant conducted air dispersion modeling, which was audited by the Air Dispersion Modeling Team. Based on the results of the dispersion model, no short-term or long-term adverse health effects are expected to occur among the public health, welfare, or the environment as a result of exposure to the emissions from the facilities authorized under this permit.

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

A. De Minimis Analysis

A De Minimis analysis was initially conducted to determine if a full impacts analysis would be required. The De Minimis analysis modeling results indicate that 24-hr and annual PM_{10}, 24-hr and annual $PM_{2.5}$ for both the NAAQS and increment standards, and 1-hr and annual NO_2 exceed the respective de minimis concentrations and require a full impacts analysis.

The De Minimis analysis modeling results for 1-hr and 8-hr CO indicate that the project is below the respective de minimis concentrations and no further analysis is required.

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

The $PM_{2.5}$ and ozone De Minimis levels are the EPA recommended De Minimis levels. The use of the EPA recommended De Minimis levels is sufficient to conclude that a proposed source will not cause or contribute to a violation of an ozone and $PM_{2.5}$ NAAQS or $PM_{2.5}$ PSD increments based on the analyses documented in EPA guidance and policy memoranda[2].

While the De Minimis levels for both the NAAQS and increment are identical for $PM_{2.5}$ in the table below, the procedures to determine significance (that is, predicted concentrations to compare to the De Minimis levels) are different. This difference occurs because the NAAQS for $PM_{2.5}$ are statistically-based, but the corresponding increments are exceedance-based.

Table 1. Modeling Results for PSD De Minimis Analysis in Micrograms Per Cubic Meter (µg/m³)

Pollutant	Averaging Time	GLCmax (µg/m³)	De Minimis (µg/m³)
PM_{10}	24-hr	13	5
PM_{10}	Annual	1.6	1
$PM_{2.5}$ (NAAQS)	24-hr	7.5	1.2
$PM_{2.5}$ (NAAQS)	Annual	1.1	0.2
$PM_{2.5}$ (Increment)	24-hr	9.8	1.2
$PM_{2.5}$ (Increment)	Annual	1.2	0.2
NO_2	1-hr	29	7.5
NO_2	Annual	1.1	1
CO	1-hr	67	2000
CO	8-hr	35	500

The 24-hr and annual $PM_{2.5}$ (NAAQS), and 1-hr NO_2 GLCmax are based on the highest five-year averages of the maximum predicted concentrations determined for each receptor. The

[1] www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf
[2] www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html

GLCmax for all other pollutants and averaging times represent the maximum predicted concentrations over five years of meteorological data.

To evaluate secondary $PM_{2.5}$ impacts, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with the EPA's Guideline on Air Quality Models (GAQM). Specifically, the applicant used a Tier 1 demonstration tool developed by the EPA referred to as Modeled Emission Rates for Precursors (MERPs). The basic idea behind the 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 500 tpy Parker County source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.02507 µg/m^3 and 0.00037 µg/m^3, respectively. 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.

Table 2. Modeling Results for Ozone PSD De Minimis Analysis in Parts per Billion (ppb)

Pollutant	Averaging Time	GLCmax (ppb)	De Minimis (ppb)
O_3	8-hr	0.24	1

The applicant performed an O_3 analysis as part of the PSD AQA. The applicant evaluated project emissions of O_3 precursor emissions (NO_x and VOC). For the project NO_x and VOC emissions, the applicant provided an analysis based on a Tier 1 demonstration approach consistent with the EPA's GAQM. Specifically, the applicant used a Tier 1 demonstration tool developed by the EPA referred to as MERPs. Using data associated with the 1000 tpy Parker County source, the applicant estimated an 8-hr O_3 concentration of 0.24 ppb. When the estimates of ozone concentrations from the project emissions are added together, the results are less than the De Minimis level.

The O_3 MERPs calculations were completed using the 1000 TPY hypothetical sources, not 500 TPY as indicated in the model report. This does not affect the outcome of the analysis.

B. Air Quality Monitoring

The De Minimis analysis modeling results indicate that 24-hr PM_{10} exceeds the respective monitoring significance level and requires the gathering of ambient monitoring information.

The De Minimis analysis modeling results indicate that annual NO_2 and 8-hr CO are below their respective monitoring significance level.

Table 3. Modeling Results for PSD Monitoring Significance Levels

Pollutant	Averaging Time	GLCmax (µg/m^3)	Significance (µg/m^3)
PM_{10}	24-hr	13	10
NO_2	Annual	1.1	14
CO	8-hr	35	575

The GLCmax represent the maximum predicted concentrations over five years of meteorological data.

The applicant evaluated ambient PM_{10} and $PM_{2.5}$ monitoring data to satisfy the requirements for the pre-application air quality analysis.

A background concentration for PM_{10} was obtained from the EPA AIRS monitor 481130061 at 3434 Bickers, Dallas, Dallas County. The high, second high 24-hr concentration from 2020-2022 was used for the 24-hr value (67 µg/m^3). The use of the monitor is reasonable based on the applicant's quantitative review of emissions surrounding the monitor site relative to the project site, land use, county population, and regional considerations. The background value was also used in the NAAQS analysis.

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 483091037 located at 4472 Mazanec Rd., Waco, McLennan County. The applicant calculated a three-year average (2020-2022) of the 98th percentile of the annual distribution of the daily concentrations for the 24-hr value (17 µg/m^3). The applicant calculated a three-year average (2020-2022) of the annual average concentrations for the annual value (7 µg/m^3). The use of the monitor is reasonable based on the applicant's quantitative review of emissions surrounding the monitor site relative to the project site, land use, county population, and regional considerations. The background values were also used in the NAAQS analysis.

Since the project has a net emissions increase of 100 tpy or more of VOC or NO_x, the applicant evaluated ambient O_3 monitoring data to satisfy the requirements for the pre-application air quality analysis.

A background concentration for O_3 was obtained from the EPA AIRS monitor 483091037 located at 4472 Mazanec Rd., Waco, McLennan County. A three-year average (2020-2022) of the annual fourth highest daily maximum 8-hr concentrations was used in the analysis (64 ppb). The use of the monitor is reasonable based on the applicant's quantitative review of emissions surrounding the monitor site relative to the project site, land use, county population, and regional considerations.

C. National Ambient Air Quality Standards (NAAQS) Analysis

The De Minimis analysis modeling results indicate that 24-hr PM_{10}, 24-hr and annual $PM_{2.5}$, and 1-hr and annual NO_2 exceed the respective de minimis concentrations and require a full impacts analysis. The full NAAQS modeling results indicate the total predicted concentrations will not result in an exceedance of the NAAQS.

Table 4. Total Concentrations for PSD 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)
PM_{10}	24-hr	16	67	83	150
$PM_{2.5}$	24-hr	6	17	23	35
$PM_{2.5}$	Annual	1.4	7	8.4	9*

NO_2	1-hr	88	41	129	188
NO_2	Annual	5	6	11	100

The 24-hr $PM_{2.5}$ GLCmax is the highest five-year average of the 98th percentile of the annual distribution of predicted 24-hr concentrations determined for each receptor.

The annual $PM_{2.5}$ GLCmax is the maximum five-year average of the annual concentrations determined for each receptor. *The applicant chose to evaluate the impacts against the new annual $PM_{2.5}$ NAAQS of 9 µg/m^3 ahead of the effective date of May 6th, 2024.

The 1-hr NO_2 GLCmax is the highest five-year average of the 98th percentile of the annual distribution of predicted daily maximum 1-hr concentrations determined for each receptor.

The annual NO_2 GLCmax is the maximum predicted concentration over five years of meteorological data.

The 24-hr PM_{10} GLCmax is the maximum high, second high (H2H) predicted concentration over five years of meteorological data.

Background concentrations for NO_2 were obtained from the EPA AIRS monitor 480271047 located at 1605 Stone Tree Dr., Killeen, Bell County. The applicant used a three-year average (2020-2022) of the 98th percentile of the annual distribution of daily maximum 1-hr concentrations for the 1-hr value. The applicant used the annual average concentration from 2021 for the annual value. The applicant should have considered the 2022 annual value in the analysis. However, the ADMT reviewed the data associated with the 2022 annual value and determined that this does not change the overall conclusions of the analysis. The use of the monitor is reasonable based on the applicant's quantitative review of emissions surrounding the monitor site relative to the project site, land use, county population, 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 the EPA's GAQM. Specifically, the applicant used a Tier 1 demonstration tool developed by the EPA referred to as MERPs Using data associated with the 500 tpy Parker County source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.02507 µg/m^3 and 0.00037 µg/m^3, respectively. When these estimates are added to the GLCmax listed in Table 4 above, the results are less than the NAAQS.

D. Increment Analysis

The De Minimis analysis modeling results indicate that 24-hr and annual PM_{10}, 24-hr and annual $PM_{2.5}$, and annual NO_2 exceed the respective de minimis concentrations and require a PSD increment analysis.

Table 5. Results for PSD Increment Analysis

Pollutant	Averaging Time	GLCmax (µg/m^3)	Increment (µg/m^3)
PM_{10}	24-hr	16	30
PM_{10}	Annual	3	17

$PM_{2.5}$	24-hr	8.6	9
$PM_{2.5}$	Annual	1.5	4
NO_2	Annual	5	25

The GLCmax for the 24-hr $PM_{2.5}$, and 24-hr PM_{10} is the maximum high, second high (H2H) predicted concentration across five years of meteorological data.

For annual NO_2, PM_{10}, and $PM_{2.5}$, the GLCmax represents the maximum predicted concentrations over five years of meteorological data.

The GLCmax for 24-hr and annual $PM_{2.5}$ reported in the table above represent the total predicted concentrations associated with modeling the direct $PM_{2.5}$ emissions and the contributions associated with secondary $PM_{2.5}$ formation (discussed above in the NAAQS Analysis section).

E. Additional Impacts Analysis

The applicant performed an Additional Impacts Analysis as part of the PSD AQA. The applicant conducted a growth analysis and determined that population will not significantly increase as a result of the proposed project. The applicant conducted a soils and vegetation analysis and determined that all evaluated criteria pollutant concentrations are below their respective secondary NAAQS. The applicant meets the Class II visibility analysis requirement by complying with the opacity requirements of 30 TAC Chapter 111. The Additional Impacts Analyses are reasonable and possible adverse impacts from this project are not expected.

The ADMT evaluated predicted concentrations from the proposed project to determine if emissions could adversely affect a Class I area. The nearest Class I area, Witchita Mountains, is located approximately 346 kilometers (km) from the proposed site.

The predicted concentrations of PM_{10}, $PM_{2.5}$, NO_2, and SO_2 for all averaging times, are all less than de minimis levels at a distance of 2 km from the proposed sources in the direction of the Witchita Mountains Class I area. The Witchita Mountains Class I area is an additional 344 km from the location where the predicted concentrations of PM_{10}, $PM_{2.5}$, NO_2, and SO_2 for all averaging times are less than de minimis. Therefore, emissions from the proposed project are not expected to adversely affect the Witchita Mountains Class I area.

F. Minor Source NSR and Air Toxics Review

Table 6. Project-Related Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	5.2	20.42

Table 7. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	5.2	7.8

SO_2	3-hr	3.5	25

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

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

Table 8. Minor NSR Project (Increases Only) Modeling Results for Health Effects

Pollutant & CAS#	Averaging Time	GLCmax (µg/m^3)	10% ESL (µg/m^3)
Hydrogen chloride 7647-01-0	1-hr	3.7	19
Hydrogen chloride 7647-01-0	Annual	0.12	0.79

G. Greenhouse Gases

EPA has stated that unlike the criteria pollutants for which EPA has historically issued PSD permits, there is no National Ambient Air Quality Standard (NAAQS) for GHGs, including no PSD increment. The global climate-change inducing effects of GHG emissions, according to the "Endangerment and Cause or Contribute Finding", are far-reaching and multi-dimensional (75 FR 66497). Climate change modeling and evaluations of risks and impacts are typically conducted for changes in emissions that are orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying the exact impacts attributable to a specific GHG source obtaining a permit in specific places and points would not be possible [EPA's PSD and Title V Permitting Guidance for GHGs at 48]. Thus, EPA has concluded in other GHG PSD permitting actions it would not be meaningful to evaluate impacts of GHG emissions on a local community in the context of a single permit.

The TCEQ has determined that an air quality analysis would provide no meaningful data and has not required the applicant to perform one. As stated in the preamble to TCEQ's adoption of the GHG PSD program, the impacts review for individual air contaminants will continue to be addressed, as applicable, in the state's traditional minor and major NSR permits program per 30 TAC Chapter 116.

VIII. Conclusion

As described above, the applicant has demonstrated that the project meets all applicable rules, regulations and requirements of the State of Texas and the Federal Clean Air Act. The Executive Director's preliminary determination is that the permits should be issued.

[3] www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf