

TCEQ Interoffice Memorandum

To: Mechanical/Coatings Section

From: Dan Jamieson
Permit Support Section

Date: August 24, 2023

Subject: Concrete Batch Plant Standard Permit Protectiveness Review - Addendum

1. Project Identification Information

An addendum to the air quality analysis (AQA) was performed in support of the concrete batch plant standard permit protectiveness review. The addendum to the AQA included dispersion modeling of a model concrete batch plant for additional maximum hourly production rates: 60 cubic yards per hour (yd³/hr) and 300 yd³/hr (based on central mix operations). For the 60 yd³/hr maximum hourly production rate case, the addendum included modeling for an annual production rate of 262,800 cubic yards per year (yd³/yr). For the 300 yd³/hr (central mix) maximum hourly production rate case, the addendum included modeling for an annual production rate of 650,000 yd³/yr.

The documentation contained below is only for the modeling associated with the additional maximum hourly/annual production rate cases. Furthermore, documentation for approaches and techniques that were utilized in the original AQA are not repeated here; instead, the full set of documentation on approaches and techniques is contained within the modeling report for the original AQA, dated February 24, 2023.

2. Report Summary

The modeling results are below in Table Add-1.

TCEQ Interoffice Memorandum

Table Add-1. Summary of Modeling Results

Production Rate	Pollutant	Averaging Time	µg/m ³ at 100 feet	µg/m ³ at 200 feet	µg/m ³ at 300 feet	µg/m ³ at 400 feet	µg/m ³ at 500 feet	µg/m ³ at 600 feet	µg/m ³ at 700 feet	µg/m ³ at 800 feet	µg/m ³ at 900 feet	µg/m ³ at 1000 feet
60 yd ³ /hr	Ni	1-hr	0.0042	0.0044	0.0043	0.0044	0.0043	0.004	0.0037	0.0034	0.003	0.0027
60 yd ³ /hr	Ni	Annual	0.0003	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
60 yd ³ /hr	SiO ₂	1-hr	7.5	7.7	7.6	7.7	7.5	7.1	6.6	6	5.4	4.9
60 yd ³ /hr	SiO ₂	Annual	0.061	0.034	0.022	0.016	0.013	0.011	0.009	0.008	0.007	0.006
60 yd ³ /hr	PM ₁₀	24-hr	66	43	35	30	27	24	21	19	17	16
60 yd ³ /hr	PM _{2.5}	24-hr	7.1	5	3.7	3.3	3	2.7	2.4	2.2	2	1.8
60 yd ³ /hr	PM _{2.5}	Annual	1.4	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.2
300 yd ³ /hr – central mix	Ni	1-hr	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
300 yd ³ /hr – central mix	Ni	Annual	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
300 yd ³ /hr – central mix	SiO ₂	1-hr	2	2.6	2.6	2.1	1.7	1.6	1.7	1.7	1.7	1.6
300 yd ³ /hr – central mix	SiO ₂	Annual	0.002	0.005	0.005	0.004	0.003	0.002	0.002	0.002	0.002	0.002
300 yd ³ /hr – central mix	PM ₁₀	24-hr	43	29	23	20	18	17	16	15	14	13
300 yd ³ /hr – central mix	PM _{2.5}	24-hr	5.3	3.9	3	2.4	2.3	2.1	1.9	1.8	1.7	1.5
650,000 yd ³ /yr – central mix	PM _{2.5}	Annual	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2

TCEQ Interoffice Memorandum

A. Setback Distances

Predicted concentrations from Table Add-1 were used together with background concentrations (discussed in the original AQA modeling report) to determine minimum setback distances between any baghouse or internal combustion engine and the nearest property line for each TCEQ Region. The minimum setback distances for the 60 yd³/hr maximum hourly production rate case also account for the 262,800 yd³/yr annual production rate. The minimum setback distances for the 300 yd³/hr (central mix) maximum hourly production rate case also account for the 650,000 yd³/yr annual production rate. The minimum setback distances are listed below by TCEQ Region for just the no partial enclosure of the truck loading activities scenario since partial enclosure of the truck loading activities do not apply to the 60 yd³/hr and 300 yd³/hr (central mix) maximum hourly production rate cases.

Table Add-2a. TCEQ Region 1 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2b. TCEQ Region 2 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2c. TCEQ Region 3 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

TCEQ Interoffice Memorandum

Table Add-2d. TCEQ Region 4 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2e. TCEQ Region 5 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2f. TCEQ Region 6 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	100	NA

Table Add-2g. TCEQ Region 7 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2h. TCEQ Region 8 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	100	NA

TCEQ Interoffice Memorandum

Table Add-2i. TCEQ Region 9 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	100	NA

Table Add-2j. TCEQ Region 10 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2k. TCEQ Region 11 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	100	NA

Table Add-2l. TCEQ Region 12 - Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties - Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	100	NA

Table Add-2m. TCEQ Region 12 - Austin, Colorado, Matagorda, Walker, and Wharton Counties - Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

TCEQ Interoffice Memorandum

Table Add-2n. TCEQ Region 13 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2o. TCEQ Region 14 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2p. TCEQ Region 15 - Cameron and Hidalgo Counties - Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	200	NA
300 – central mix	200	NA

Table Add-2q. TCEQ Region 15 - Brooks, Jim Hogg, Kenedy, Starr, and Willacy Counties - Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

Table Add-2r. TCEQ Region 16 Minimum Setback Distances (feet)

Production Rate (yd ³ /hr)	No Partial Enclosure of Truck Loading	Partial Enclosure of Truck Loading
60	100	NA
300 – central mix	100	NA

TCEQ Interoffice Memorandum

As noted above, the minimum setback distances listed in Tables Add-2a – Add-2r are for any baghouse or internal combustion engine and the nearest property line. For the other emission generating facilities or activities (material handling activities, truck loading, and stockpiles), they shall not be located closer than 50 feet less than the applicable minimum setback distance to the nearest property line (e.g., 50 feet for a minimum setback distance of 100 feet; 150 feet for a minimum setback distance of 200 feet).

3. Model Used and Modeling Techniques

ISCST3 (Version 02035) was used.

For both of the annual production rates (262,800 yd³/yr and 650,000 yd³/yr), the results were obtained from the generic modeling (as documented in the original AQA modeling report).

For the 24-hr PM₁₀ 60 yd³/hr and the 24-hr PM₁₀ and 24-hr PM_{2.5} 300 yd³/hr (central mix) maximum hourly production rates, pollutant-specific modeling was performed for the NAAQS demonstrations. The pollutant-specific modeling considered the form of the applicable NAAQS, i.e., high sixth high 24-hr concentration over five years for PM₁₀ and five-year average of the 98th percentile of 24-hr concentrations for 24-hr PM_{2.5}.

For the 24-hr PM_{2.5} 60 yd³/hr maximum hourly production rate, the results from the original 30 yd³/hr maximum hourly production rate case were conservatively doubled. This is a conservative approach since the internal combustion engine and stockpile emissions would not be doubled for the 60 yd³/hr maximum hourly production rate case.

4. Modeling Emissions Inventory

The emission rates modeled are listed below in Table Add-3.

Table Add-3. Modeled Emission Rates

Source Group	Production Rate	Pollutant	Averaging Time	Rate (lb/hr)
SILOS	60 yd ³ /hr	PM ₁₀	24-hr	0.047
SILOS	60 yd ³ /hr	PM _{2.5}	24-hr	5.38E-03
SILOS	60 yd ³ /hr	PM _{2.5}	Annual	2.69E-03
SILOS	60 yd ³ /hr	SiO ₂	1-hr	2.94E-03
SILOS	60 yd ³ /hr	SiO ₂	Annual	2.38E-04
FUG	60 yd ³ /hr	PM ₁₀	24-hr	0.397
FUG	60 yd ³ /hr	PM _{2.5}	24-hr	0.051

TCEQ Interoffice Memorandum

Source Group	Production Rate	Pollutant	Averaging Time	Rate (lb/hr)
FUG	60 yd ³ /hr	PM _{2.5}	Annual	0.026
FUG	60 yd ³ /hr	Ni	1-hr	1.1E-05
FUG	60 yd ³ /hr	Ni	Annual	5.6E-06
FUG	60 yd ³ /hr	SiO ₂	1-hr	0.019
FUG	60 yd ³ /hr	SiO ₂	Annual	1.16E-03
SILOS	300 yd ³ /hr – central mix	PM ₁₀	24-hr	0.494
SILOS	300 yd ³ /hr – central mix	PM _{2.5}	24-hr	0.058
SILOS	300 yd ³ /hr – central mix	Ni	1-hr	2.77E-06
SILOS	300 yd ³ /hr – central mix	Ni	Annual	6.9E-07
SILOS	300 yd ³ /hr – central mix	SiO ₂	1-hr	0.022
SILOS	300 yd ³ /hr – central mix	SiO ₂	Annual	9E-04
FUG	300 yd ³ /hr – central mix	PM ₁₀	24-hr	0.233
FUG	300 yd ³ /hr – central mix	PM _{2.5}	24-hr	0.0353
SILOS	650,000 yd ³ /yr – central mix	PM _{2.5}	Annual	0.0143
FUG	650,000 yd ³ /yr – central mix	PM _{2.5}	Annual	0.0094
ENGINE	All	PM ₁₀	24-hr	0.164
ENGINE	All	PM _{2.5}	24-hr	0.164
ENGINE	All	PM _{2.5}	Annual	0.164

TCEQ Interoffice Memorandum

With the exception of the internal combustion engine, all other sources were modeled with maximum hourly emission rates for the short-term standards and thresholds and annual average emission rates for the annual standards and thresholds. For the internal combustion engine, maximum hourly emission rates were modeled for both the short-term and annual standards and thresholds.