Air Dispersion Modeling Summary for Permit No. 8585

Report Date: 1/27/2020
NMED/AQB Modeler: Eric Peters

Facility Identification:
Project: Santa Fe Facility Company: Associated Asphalt and Materials, LLC
Permit number: 8585 TEMPO ID: 39276

Location Information:
The facility is located 3.3 miles west-southwest of Agua Fria, in Santa Fe County. The facility is located 4.5 miles north-northeast of La Cienega.
UTM Coordinates: 403,000 m East, 3,944,800 m North, zone 13, Datum: NAD83
Elevation = 6365 feet
Air Quality Control Region (AQCR): 157
Airshed: Urg

Project Description:
Brief: Associated Asphalt and Materials, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the construction of the Santa Fe Facility (the facility). The facility is an asphalt plant. The purpose of the project is to obtain a new permit for an asphalt plant. The new permit will allow several facilities nearby to consolidate operations on one property, which will reduce the haul road emissions for the area.

The following types of emission sources are included in the project: Aggregate Loop Unpaved Haul Road, Crusher/Screen Finish Product Storage Pile, Crusher/Screen Plant Conveyor, Crusher/Screen Plant Crusher, Crusher/Screen Plant Feeder, Crusher/Screen Plant Generator/Engine, Crusher/Screen Plant Raw Material, Crusher/Screen Plant Return Conveyor, Crusher/Screen Plant Screen, Crusher/Screen Plant Screen Conveyor, Crusher/Screen Stacker Conveyor Drop to Pile, Paved HMA Main Haul Road, Paved Main Crusher Haul Road, Plant 2 HMA Asphalt Cement Heater, Plant 2 HMA Asphalt Mixer Unloading, Plant 2 HMA Baghouse Stack, Plant 2 HMA Bin Loading, Plant 2 HMA Bin Unloading Conveyor, Plant 2 HMA Mineral Filler Silo Loading, Plant 2 HMA Sling Conveyor, Plant 2 HMA Storage Pile Handling, Plant 2 HMA Transfer Conveyor, Plant 5 Asphalt Silo Unloading, Plant 5 Drum Mixer Unloading, Plant 5 HMA Asphalt Cement Heater, Plant 5 HMA Baghouse Stack, Plant 5 HMA Bin Loading, Plant 5 HMA Bin Unloading, Plant 5 HMA Conveyor Transfer to Drum Conveyor, Plant 5 HMA Mineral Filler Silo Loading, Plant 5 HMA Pug Mill, Plant 5 HMA Pug Mill Unloading, Plant 5 HMA Scalping Screen, Plant 5 HMA Scalping Screen Unloading, Plant 5 HMA Storage Pile Handling, Scalping Screen Conveyor Drop to Pile, Scalping Screen Finish Product Storage Pile, Scalping Screen Plant Conveyor, Scalping Screen Plant Engine, Scalping Screen Plant Feeder, Scalping Screen Plant Raw Material, and Scalping Screen Plant Screen. The emission units are described in Table 1: Table of Emissions and Stack Parameters, below.

For this permit, modeling was required for the following pollutants: Asphalt Fumes, Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Particulate Matter 10 micrometers or less in aerodynamic diameter (PM10), Particulate Matter (2.5 microns or less) (PM2.5), and Sulfur Dioxide (SO_2).

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Table 1: Table of Total Facility Emissions

NO_2 Rate (lbs/hr)	CO Rate (lbs/hr)	SO_2 Rate (lbs/hr)	Asphalt fumes Rate (lbs/hr)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
15.721	103.374	1.720	6.253	18.836	12.500

Table 2: Table of Point Sources[1]

Stack Number	Description	Stack Height (ft)	Diameter (ft)	Velocity (ft/s)	Temperature (°F)	NO_2 Rate (lbs/hr)	CO Rate (lbs/hr)	SO_2 Rate (lbs/hr)	Asphalt fumes Rate (lbs/hr)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
P2HMASTK	Plant 2 HMA Baghouse Stack	30.0	2.3	40.0	285	3.750	59.999	0.690	2.550	4.050	3.810
P2BATCHUL	Plant 2 HMA Asphalt Mixer Unloading	19.7	3.3	0.0	350	0	0.202	0	0.013	0.078	0.078
P5HMASTK	Plant 5 HMA Baghouse Stack	40.0	3.0	40.0	285	7.800	38.999	1.020	3.600	6.900	6.900
P5DRUMUL	Plant 5 Drum Mixer Unloading	13.1	3.3	0.0	350	0	0.354	0	0.057	0.176	0.176
P5SILOUL	Plant 5 Asphalt Silo Unloading	19.7	3.3	0.0	350	0	0.405	0	0.026	0.157	0.157
P2HMAHT	Plant 2 HMA Asphalt Cement Heater	12.0	1.0	27.9	600	0.829	0.697	0.005	0	0.063	0.063
P5HMAHT	Plant 5 HMA Asphalt Cement Heater	12.0	1.0	27.9	600	0.138	0.116	0.001	0	0.011	0.011
CH_E	Crusher/Screen Plant Generator/Engine	12.0	0.5	228.7	847	2.372	2.076	0.004	0	0.012	0.012
SS_E	Scalping Screen Plant Engine	7.0	0.2	326.2	850	0.832	0.367	0.001	0	0.121	0.121

Table 3: Table of PointHor Sources[1]

Stack Number	Description	Stack Height (ft)	Diameter (ft)	Velocity (ft/s)	Temperature (°F)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
P2HMAFIL	Plant 2 HMA Mineral Filler Silo Loading	45.0	1.0	10.6	-460	0.011	0.003
P5HMAFIL	Plant 5 HMA Mineral Filler Silo Loading	45.0	1.0	10.6	-460	0.021	0.005

Table 4: Table of Volume Sources[1]

Source ID	Description	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	CO Rate (lbs/hr)	Asphalt fumes Rate (lbs/hr)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
AGG_01	Aggregate Loop Unpaved Haul Road	11.2	19.8	10.4	0	0	0.820	0.082
CH_FP	Crusher/Screen Finish Product Storage Pile	13.1	3.8	7.6	0	0	0.516	0.078
CH_C1	Crusher/Screen Plant Conveyor	6.6	1.5	3.1	0	0	0.028	0.008
CH	Crusher/Screen Plant Crusher	19.7	3.8	7.6	0	0	0.108	0.020
CH_F	Crusher/Screen Plant Feeder	19.7	3.8	7.6	0	0	0.516	0.078
CH_RAW	Crusher/Screen Plant Raw Material	13.1	3.8	7.6	0	0	0.516	0.078
CH_RC	Crusher/Screen Plant Return Conveyor	6.6	1.5	3.1	0	0	0.009	0.003
CH_S	Crusher/Screen Plant Screen	13.1	3.8	7.6	0	0	0.148	0.010
CH_SC1	Crusher/Screen Plant Screen Conveyor	6.6	1.5	3.1	0	0	0.018	0.005
CH_STK	Crusher/Screen Stacker Conveyor Drop to Pile	13.1	1.5	3.1	0	0	0.310	0.047
PAV_17	Paved HMA Main Haul Road	11.2	19.8	10.4	0.159	0.008	0.967	0.237
PCSH_01	Paved Main Crusher Haul Road	11.2	19.8	10.4	0	0	0.336	0.082
P2HMABIN	Plant 2 HMA Bin Loading	19.7	3.8	7.6	0	0	0.359	0.054

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P2HMATP1	Plant 2 HMA Bin Unloading Conveyor	6.6	1.5	3.1	0	0	0.006	0.002
P2HMATP3	Plant 2 HMA Sling Conveyor	6.6	1.5	3.1	0	0	0.006	0.002
P2HMAP1	Plant 2 HMA Storage Pile Handling	8.0	23.5	7.4	0	0	0.359	0.054
P2HMATP2	Plant 2 HMA Transfer Conveyor	13.1	3.8	7.6	0	0	0.006	0.002
P5HMABIN	Plant 5 HMA Bin Loading	19.7	3.8	7.6	0	0	0.717	0.109
P5HMATP1	Plant 5 HMA Bin Unloading	6.6	1.5	3.1	0	0	0.013	0.004
P5HMATP4	Plant 5 HMA Conveyor Transfer to Drum Conveyor	6.6	1.5	3.1	0	0	0.013	0.004
P5HMAPUG	Plant 5 HMA Pug Mill	13.1	3.8	7.6	0	0	0.013	0.004
P5HMATP3	Plant 5 HMA Pug Mill Unloading	6.6	1.5	3.1	0	0	0.013	0.004
P5HMASCR	Plant 5 HMA Scalping Screen	13.1	3.8	7.6	0	0	0.206	0.014
P5HMATP2	Plant 5 HMA Scalping Screen Unloading	6.6	1.5	3.1	0	0	0.013	0.004
P5HMAP1	Plant 5 HMA Storage Pile Handling	8.0	23.5	7.4	0	0	0.717	0.109
SS_STK	Scalping Screen Conveyor Drop to Pile	13.1	1.5	3.1	0	0	0.077	0.012

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Source ID	Description	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	CO Rate (lbs/hr)	Asphalt fumes Rate (lbs/hr)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
SS_FP	Scalping Screen Finish Product Storage Pile	13.1	3.8	7.6	0	0	0.129	0.020
SS_C	Scalping Screen Plant Conveyor	6.6	1.5	3.1	0	0	0.002	0.001
SS_F	Scalping Screen Plant Feeder	19.7	3.8	7.6	0	0	0.129	0.020
SS_RAW	Scalping Screen Plant Raw Material	13.1	3.8	7.6	0	0	0.129	0.020
SS	Scalping Screen Plant Screen	13.1	3.8	7.6	0	0	0.037	0.002

[1] All values copied or converted from Santa Fe Facility Permit Application.

Modeling Assumptions:
HMA Plants #2 and #5 operate twelve hours per day, but starting time is flexible. The HMA plants do not operate at night during the winter but may during other seasons.

Permit Conditions:
Operating hours: The asphalt plants shall only operate during daylight hours in the winter and may operate day or night during other seasons.
(Other permit limits should be based on production limits instead of operating hours.)

Conclusion:
This modeling analysis demonstrates that operation of the facility described in this report neither causes nor contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS for CO, NO_2, PM10, PM2.5, and SO_2; NMAAQS for CO, NO_2, and SO_2. 20.2.72.400-499 NMAC establishes permitting requirements for State Toxic Air Pollutants (TAPs) which are identified in 20.2.72.502 NMAC. The regulations require a source to conduct modeling to predict the concentration of a TAP if its potential emission rate is greater than the screening level identified in that section. The screening level may be adjusted by the stack height correction factor listed in 20.2.72.502 NMAC. If a source must model the concentration of a TAP, the TAP is not expected to pose an environmental concern, and no further action is required, if its concentration remain below one percent of the Occupational Exposure Limit (OEL) for that TAP. For this application, modeling demonstrates that the concentrations of Asphalt Fumes remain below one percent of the OEL.

Action: The permit can be issued based on this modeling analysis.

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Modeling report submitted by Montrose Air Quality Services (dated 11/26/2019). Revised modeling was submitted January 27, 2020.

The air quality analysis demonstrates compliance with applicable regulatory requirements.

Model(s) Used: AERMOD was used to run the modeling analysis.

Note: Complete modeling input and output files can be made available and are located in the Modeling Archives in the folder, "8585_Associated Asphalt and Materials, LLC_Santa Fe Facility".

Number of Model Runs: AERMOD - 100 modeling runs were reviewed by NMED.

Modeling Parameters:
The AERMOD regulatory default parameters were included in assumptions made by the model.

Building downwash produced by buildings at the facility was considered. The following buildings were included in the modeling.

Table 5: Table of Buildings

Building Name	Height (m)	Diagonal Length (m)
OFFICE	4.6	72.2
SHOP	9.1	47.8

Complex Terrain Data:
Both simple and complex types of terrain were used to model the facility. Elevations of receptors, facility sources, and surrounding sources were obtained from digitized USGS 7.5-minute maps and one-degree maps.

Receptor Grid: The following grids were used to determine the maximum concentration for each pollutant.

Table 6: Table of Receptors

Grid Type	Description	Shape	Spacing	Length
Cartesian	Rough	Square	1000 meters	16 kilometers
Cartesian	Intermediate	Square	500 meters	11 kilometers
Cartesian	Intermediate	Square	250 meters	6.5 kilometers
Cartesian	Fine	Square	100 meters	2.3 kilometers
Cartesian	Very fine	Square	50 meters	1.2 kilometers
Fence line	Very fine	Fence line	50 meters	Fence line

Receptors outside of the radii of impact were discarded for the surrounding source runs. Receptors that demonstrated compliance were then discarded, and further detailed analysis was performed on the remaining receptors.
Meteorological Data: AERMOD – Santa Fe 2016.

Adjacent Sources:
The Division 's Modeling Guidance was used to select 190 sources within 50 km of the facility. The facility is 0.2 km from Eker Bros - 300TPH Portable Crusher No2223. The facility is 0.3 km from GM Emulstion LLC GCP2-5128. The facility is 0.3 km from Associated Asphalt - AA No 5 Asphalt & Concrete Recycling Plant. The facility is 30.6 km from Los Alamos National Laboratory. The facility is 66.6 km from MSCI - 500TPH Crusher NSR-2190. The facility is 70.8 km from Intel - Rio Rancho Facility.

PM2.5 emission rates of permit 3534 were determined to be exaggerated in NMED databases. The emission rate for this concrete batch plant was recalculated to be no greater than 0.85 pounds per hour.

Modeling Procedures: Concentrations above air quality standards were predicted within several facilities. When the maps and contributions were examined, it was determined that these areas did not have concentrations above air quality standards because the contribution of a facility to concentrations within its own fenced property should not be considered to affect ambient air.

PSD Increment Information:
The facility is a minor source (for PSD purposes) located in AQCR 157. The minor source baseline dates here are not yet established for NO_2, not yet established for SO_2, not yet established for PM10, and not yet established for PM2.5.
The facility is 19.8 km from the Class I area Bandelier Wilderness Area. The facility is 24.2 km from the Class I area Pecos Wilderness Area. Class I area modeling is not required.

Results Discussion:
Asphalt Fumes Analysis:
New Mexico State Toxics are not expected to pose environmental concern if their concentrations remain below one percent of the occupational exposure limit (OEL) for that pollutant. The maximum 8-hour Asphalt Fumes concentration was 25.462 $\mu g/m^3$, which occurred 230 m south-southeast from the center of the facility. This was 50.9% of 1% of the OEL.

CO Analysis:
The 1-hour CO concentration was below the significance level. No cumulative analysis is required. The maximum source alone 1-hour CO concentration was 665.902 $\mu g/m^3$, which occurred 94 m north-northwest from the center of the facility. This was 4.4% of the NMAAQS.

The 8-hour CO concentration was below the significance level. No cumulative analysis is required. The maximum source alone 8-hour CO concentration was 499.806 $\mu g/m^3$, which occurred 230 m south-southeast from the center of the facility. This was 5.0% of the NMAAQS.

NO_2 Analysis:
ARM2 was used with default options (0.5 minimum ratio, 0.9 maximum ratio) to determine the conversion of NO_X to NO_2.
Compliance with 1-hour NO_2 NAAQS automatically demonstrates compliance with air quality standards of other periods. The maximum total 1-hour NO_2 concentration was 127.158 µg/m^3, which occurred 230 m south-southeast from the center of the facility. This was 67.6% of the NAAQS. A background concentration of 67.300 µg/m^3 was added from the monitor 1ZB, at Bloomfield-Patrol District 162 Hwy 544. The maximum source alone 1-hour NO_2 concentration was 122.969 µg/m^3, which occurred 94 m south-southeast from the center of the facility. This was 65.4% of the NAAQS.

The maximum total 24-hour NO_2 concentration was 103.620 µg/m^3, which occurred 230 m south-southeast from the center of the facility. This was 55.1% of the NMAAQS. A background concentration of 67.300 µg/m^3 was added from the monitor 1ZB, at Bloomfield-Patrol District 162 Hwy 544. The maximum source alone 24-hour NO_2 concentration was 36.320 µg/m^3, which occurred 230 m south-southeast from the center of the facility. This was 19.3% of the NMAAQS.

The maximum total annual NO_2 concentration was 25.818 µg/m^3, which occurred 218 m south from the center of the facility. This was 27.5% of the NMAAQS. A background concentration of 19.600 µg/m^3 was added from the monitor 1ZB, at Bloomfield-Patrol District 162 Hwy 544. The maximum source alone annual NO_2 concentration was 6.218 µg/m^3, which occurred 218 m south from the center of the facility. This was 6.6% of the NMAAQS.

PM10 Analysis:
The maximum total 24-hour PM10 concentration was 130.753 µg/m^3, which occurred 695 m south-southwest from the center of the facility. This was 87.2% of the NAAQS. A background concentration of 20.700 µg/m^3 was added from the monitor 3HM, at Santa Fe-Runnels Building 1190 St Francis. The maximum source alone 24-hour PM10 concentration was 85.079 µg/m^3, which occurred 129 m south-southwest from the center of the facility. This was 56.7% of the NAAQS.

PM2.5 Analysis:
The maximum total 24-hour PM2.5 concentration was 34.020 µg/m^3, which occurred 1265 m south-southwest from the center of the facility. This was 97.2% of the NAAQS. A background concentration of 9.450 µg/m^3 was added from the monitor 3HM, at Santa Fe-Runnels Building 1190 St Francis. The maximum source alone 24-hour PM2.5 concentration was 25.020 µg/m^3, which occurred 112 m south-southwest from the center of the facility. This was 71.5% of the NAAQS.

The maximum total annual PM2.5 concentration was 11.912 µg/m^3, which occurred 695 m south-southwest from the center of the facility. This was 99.3% of the NAAQS. A background concentration of 4.320 µg/m^3 was added from the monitor 3HM, at Santa Fe-Runnels Building 1190 St Francis. The maximum source alone annual PM2.5 concentration was 3.191 µg/m^3, which occurred 218 m south-southwest from the center of the facility. This was 26.6% of the NAAQS.

SO_2 Analysis:
Compliance with 1-hour SO_2 NAAQS automatically demonstrates compliance with air quality standards of other periods. The maximum total 1-hour SO_2 concentration was 14.530 µg/m^3, which occurred 246 m south-southeast from the center of the facility. This was 7.4% of the NAAQS. A background concentration of 5.310 µg/m^3 was added from the monitor 1ZB, at Bloomfield-Patrol District 162 Hwy 544. The maximum source alone 1-hour SO_2 concentration was 9.220 µg/m^3, which occurred 246 m south-southeast from the center of the facility. This was 4.7% of the NAAQS.

Table 7: Table of Ambient Impact from Emissions

Pollutant	Period	Facility Concentration (µg/m^3)	Modeled Concentration (µg/m^3)	Modeled Concentration (PPM)	Background Concentration	Cumulative Concentration	Standard	Value of Standard	Units of Standard, Background, and Total	Percent of Standard
Asphalt Fumes	8-hour	25.462	25.462	N/A		25.462	1%OEL	50	µg/m^3	50.9
CO	1-hour	665.902	665.902	0.7253		665.902	NMAAQS	14997.5	µg/m^3	4.4
CO	8-hour	499.806	499.806	0.5440		499.806	NMAAQS	9960.1	µg/m^3	5.0
NO_2	1-hour	122.969	59.858	0.0397	67.300	127.158	NAAQS	188.03	µg/m^3	67.6
NO_2	24-hour	36.320	36.320	0.0241	67.300	103.620	NMAAQS	188.03	µg/m^3	55.1
NO_2	annual	6.218	6.218	0.0041	19.600	25.818	NMAAQS	94.02	µg/m^3	27.5
PM10	24-hour	85.079	110.053	N/A	20.700	130.753	NAAQS	150	µg/m^3	87.2
PM2.5	24-hour	25.020	24.570	N/A	9.450	34.020	NAAQS	35	µg/m^3	97.2
PM2.5	annual	3.191	7.592	N/A	4.320	11.912	NAAQS	12	µg/m^3	99.3
SO_2	1-hour	9.220	9.220	0.0044	5.310	14.530	NAAQS	196.4	µg/m^3	7.4

Table 8: Table of Location of Maximum Concentrations

Pollutant	Period	UTM East (m)	UTM North (m)	Elevation (ft)	Distance (m)	ROI (m)
Asphalt Fumes	8-hour	403,067.0	3,944,580.0	6356	230	0
CO	1-hour	402,951.0	3,944,880.0	6374	94	0
CO	8-hour	403,067.0	3,944,580.0	6356	230	0
NO_2	1-hour	403,067.0	3,944,580.0	6356	230	11173
NO_2	24-hour	403,067.0	3,944,580.0	6356	230	11173
NO_2	annual	403,032.0	3,944,584.0	6353	218	11173
PM10	24-hour	402,650.0	3,944,200.0	6343	695	1703
PM2.5	24-hour	402,600.0	3,943,600.0	6336	1265	4033
PM2.5	annual	402,650.0	3,944,200.0	6343	695	1817
SO_2	1-hour	403,101.0	3,944,576.0	6359	246	269