

Air Dispersion Modeling Summary for Permit No. 8661

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Facility Identification:

Project: Rio Rancho Facility Company: PG Enterprises, LLC

Permit number: 8661 TEMPO ID: 39077

Location Information:

The facility is located 2.2 miles east-southeast of Rio Rancho, in Sandoval County. The facility is located 3.3 miles northwest of Corrales.

UTM Coordinates: 349,040 m East, 3,905,200 m North, zone 13, Datum: NAD83

Elevation = 5500 feet

Air Quality Control Region (AQCR): 152

Airshed: Mrg

Project Description:

Brief: PG Enterprises, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the construction of the Rio Rancho Facility (the facility). The facility is a gravel crusher.

The following types of emission sources are included in the project: Access Road, Conveyor, Engine, Feeder, Finish Storage Pile, Impact Crusher, Jaw Crusher, Raw Material, Screen, Stacker Conveyor, and Truck Loading. 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: Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Particulate Matter 10 micrometers or less in aerodynamic diameter (PM₁₀), Particulate Matter (2.5 microns or less) (PM_{2.5}), and Sulfur Dioxide (SO₂).

Table 1: Table of Total Facility Emissions

NO ₂ Rate (lbs/hr)	CO Rate (lbs/hr)	SO ₂ Rate (lbs/hr)	PM ₁₀ Rate (lbs/hr)	PM _{2.5} Rate (lbs/hr)
4.629	3.923	0.007	2.359	0.536

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Table 2: Table of Point Sources¹

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)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
1	Engine	12.0	0.3	150.0	793	1.512	1.323	0.003	0.076	0.076
2	Engine	12.0	0.3	150.0	793	2.032	1.778	0.003	0.102	0.102
3	Engine	12.0	0.3	150.0	793	1.085	0.822	0.001	0.049	0.049

Table 3: Table of Volume Sources¹

Source ID	Description	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
HRI_0001	Access Road	11.2	19.8	10.4	0.285	0.028
6	Conveyor	6.6	1.5	3.1	0.034	0.010
4	Feeder	19.7	3.8	7.6	0.335	0.051
FPILE	Finish Storage Pile	8.0	11.6	7.3	0.335	0.051
7	Impact Crusher	19.7	3.8	7.6	0.081	0.015
5	Jaw Crusher	19.7	3.8	7.6	0.081	0.015
RAW	Raw Material	8.0	11.6	7.3	0.335	0.051
9	Screen	13.1	3.8	7.6	0.111	0.007
13	Stacker Conveyor	13.1	1.5	3.1	0.201	0.030
TL	Truck Loading	19.7	3.8	7.6	0.335	0.051

¹ All values copied or converted from Rio Rancho Facility Permit Application.

Modeling Assumptions:

The facility operates from 7AM to 6PM, daylight hours only.

Permit Conditions:

Operating hours: The facility shall have maximum operating hours from 7AM to 6PM and shall only operate during daylight hours.

All NO₂ emission sources listed in the permit shall be at least 67 meters from the nearest fenceline.

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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, NO₂, PM₁₀, PM_{2.5}, and SO₂; NMAAQs for CO, NO₂, and SO₂; and Class I and Class II PSD increments for NO₂, PM₁₀, PM_{2.5}, and SO₂.

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

Modeling report submitted by Montrose Air Quality Services (dated 1/21/2020)
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, "8661_PG Enterprises, LLC_Rio Rancho Facility".

Number of Model Runs: AERMOD - 28 modeling runs were reviewed by NMED.

Modeling Parameters:

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

Building downwash was not modeled because the facility contains no buildings that cause significant building wake effects.

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. Flat terrain was used for fugitive sources.

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

Table 4: Table of Receptors

Grid Type	Description	Shape	Spacing	Length
Cartesian	Rough	Square	1000 meters	22 kilometers
Cartesian	Intermediate	Square	500 meters	11 kilometers
Cartesian	Intermediate	Square	250 meters	6.5 kilometers
Cartesian	Fine	Square	100 meters	2.4 kilometers
Cartesian	Very fine	Square	50 meters	1.4 kilometers
Fence line	Very, very fine	Fence line	25 meters	Fence line

Receptors outside of the radii of impact were discarded for the surrounding source runs.

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Meteorological Data: AERMOD one year – Rio Rancho 2008.

Adjacent Sources:

The Division's Modeling Guidance was used to select 226 sources within 50 km of the facility. The facility is 3.1 km from Vulcan Materials- Rio Rancho, GCP5-1070. The facility is 3.2 km from Duke City Redi Mix CBP GCP5-4212. The facility is 3.3 km from Roadrunner Real Estate GCP5-3474. The facility is 6.3 km from Intel - Rio Rancho Facility. The facility is 51.9 km from MSCI - 500TPH Crusher NSR-2190. The facility is 73.7 km from Transwestern Pipeline Co - No6 Compressor Station Laguna.

PSD Increment Information:

The facility is a minor source (for PSD purposes) located in AQCR 152. The minor source baseline dates here are 3/26/1997 for NO₂, 5/14/1981 for SO₂, 3/26/1997 for PM₁₀, and 2/11/2013 for PM_{2.5}.

The facility is 54.1 km from the Class I area Bandelier Wilderness Area. Class I area impacts are negligible for minor sources over 50 km from a Class I area. Modeling is not required.

Results Discussion:

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 282.584 µg/m³, which occurred 55 m south from the center of the facility. This was 1.9% 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 181.343 µg/m³, which occurred 51 m south-southeast from the center of the facility. This was 1.8% of the NMAAQS.

NO₂ Analysis:

ARM2 was used with default options (0.5 minimum ratio, 0.9 maximum ratio) to determine the conversion of NO_x to NO₂.

Compliance with 1-hour NO₂ NAAQS automatically demonstrates compliance with air quality standards of other periods. The maximum total 1-hour NO₂ concentration was 182.444 µg/m³, which occurred 43 m west-northwest from the center of the facility. This was 97.0% of the NAAQS. A background concentration of 73.000 µg/m³ was added from the monitor, at . The maximum source alone 1-hour NO₂ concentration was 166.378 µg/m³, which occurred 55 m west-northwest from the center of the facility. This was 88.5% of the NAAQS.

The maximum total annual NO₂ concentration was 62.212 µg/m³, which occurred 44 m east-southeast from the center of the facility. This was 66.2% of the NMAAQS. The maximum source alone annual NO₂ concentration was 11.554 µg/m³, which occurred 44 m east-southeast from the center of the facility. This was 12.3% of the NMAAQS.

The maximum total annual NO₂ concentration was 14.002 µg/m³, which occurred 45 m east-southeast from the center of the facility. This was 56.0% of the PSD Class II increment.

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PM10 Analysis:

The maximum total 24-hour PM10 concentration was 106.582 $\mu\text{g}/\text{m}^3$, which occurred 57 m north from the center of the facility. This was 71.1% of the NAAQS. A background concentration of 74.000 $\mu\text{g}/\text{m}^3$ was added from the monitor 350010026, at 3700 Singer, Albuquerque. The maximum source alone 24-hour PM10 concentration was 44.124 $\mu\text{g}/\text{m}^3$, which occurred 51 m north from the center of the facility. This was 29.4% of the NAAQS.

The maximum total 24-hour PM10 concentration was 29.929 $\mu\text{g}/\text{m}^3$, which occurred 44 m north-northwest from the center of the facility. This was 99.8% of the PSD Class II increment. The maximum source alone 24-hour PM10 concentration was 24.665 $\mu\text{g}/\text{m}^3$, which occurred 51 m north-northwest from the center of the facility. This was 82.2% of the PSD Class II increment.

The maximum total annual PM10 concentration was 14.151 $\mu\text{g}/\text{m}^3$, which occurred 44 m north-northwest from the center of the facility. This was 83.2% of the PSD Class II increment. The maximum source alone annual PM10 concentration was 10.345 $\mu\text{g}/\text{m}^3$, which occurred 44 m north-northwest from the center of the facility. This was 60.9% of the PSD Class II increment.

PM2.5 Analysis:

The maximum total 24-hour PM2.5 concentration was 23.080 $\mu\text{g}/\text{m}^3$, which occurred 175 m north-northwest from the center of the facility. This was 65.9% of the NAAQS. A background concentration of 10.800 $\mu\text{g}/\text{m}^3$ was added from the monitor 350010023, at 4700A SAN MATEO NE. The maximum source alone 24-hour PM2.5 concentration was 11.441 $\mu\text{g}/\text{m}^3$, which occurred 51 m north-northwest from the center of the facility. This was 32.7% of the NAAQS.

The maximum total annual PM2.5 concentration was 11.047 $\mu\text{g}/\text{m}^3$, which occurred 175 m north-northwest from the center of the facility. This was 92.1% of the NAAQS. A background concentration of 4.600 $\mu\text{g}/\text{m}^3$ was added from the monitor 350010023, at 4700A SAN MATEO NE. The maximum source alone annual PM2.5 concentration was 2.229 $\mu\text{g}/\text{m}^3$, which occurred 43 m north-northwest from the center of the facility. This was 18.6% of the NAAQS.

The maximum total 24-hour PM2.5 concentration was 6.676 $\mu\text{g}/\text{m}^3$, which occurred 51 m south-southeast from the center of the facility. This was 74.2% of the PSD Class II increment.

The maximum total annual PM2.5 concentration was 2.251 $\mu\text{g}/\text{m}^3$, which occurred 44 m north-northwest from the center of the facility. This was 56.3% of the PSD Class II increment.

SO₂ Analysis:

Compliance with 1-hour SO₂ NAAQS automatically demonstrates compliance with air quality standards of other periods. The 1-hour SO₂ concentration was below the significance level. No cumulative analysis is required. The maximum source alone 1-hour SO₂ concentration was 0.510 $\mu\text{g}/\text{m}^3$, which occurred 55 m south from the center of the facility. This was 0.3% of the NAAQS.

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Table 5: 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
CO	1-hour	282.584	282.584	0.2984		282.584	NMAAQs	14997.5	µg/m ³	1.9
CO	8-hour	181.343	181.343	0.1915		181.343	NMAAQs	9960.1	µg/m ³	1.8
NO ₂	1-hour	166.378	109.444	0.0703	73.00	182.444	NAAQS	188.03	µg/m ³	97.0
NO ₂	annual	11.554	62.212	0.0400		62.212	NMAAQs	94.02	µg/m ³	66.2
NO ₂	annual		14.002	0.0090		14.002	PSD Class II	25	µg/m ³	56.0
PM ₁₀	24-hour	44.124	32.582	N/A	74.00	106.582	NAAQS	150	µg/m ³	71.1
PM ₁₀	24-hour	24.665	29.929	N/A		29.929	PSD Class II	30	µg/m ³	99.8
PM ₁₀	annual	10.345	14.151	N/A		14.151	PSD Class II	17	µg/m ³	83.2
PM _{2.5}	24-hour	11.441	12.280	N/A	10.80	23.080	NAAQS	35	µg/m ³	65.9
PM _{2.5}	annual	2.229	6.447	N/A	4.60	11.047	NAAQS	12	µg/m ³	92.1
PM _{2.5}	24-hour		6.676	N/A		6.676	PSD Class II	9	µg/m ³	74.2
PM _{2.5}	annual		2.251	N/A		2.251	PSD Class II	4	µg/m ³	56.3
SO ₂	1-hour	0.510	0.510	0.0002		0.510	NAAQS	196.4	µg/m ³	0.3

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Table 6: Table of Location of Maximum Concentrations

Pollutant	Period	UTM East (m)	UTM North (m)	Elevation (ft)	Distance (m)	ROI (m)
CO	1-hour	349,043.0	3,905,145.0	5530	55	0
CO	8-hour	349,050.0	3,905,150.0	5527	51	0
NO ₂	1-hour	349,004.0	3,905,223.0	5505	43	4848
NO ₂	annual	349,079.0	3,905,179.0	5523	44	5690
NO ₂	annual	349,079.0	3,905,179.0	5523	45	5690
PM10	24-hour	349,041.0	3,905,257.0	5488	57	260
PM10	24-hour	349,023.0	3,905,240.0	5492	44	260
PM10	annual	349,023.0	3,905,240.0	5492	44	260
PM2.5	24-hour	348,950.0	3,905,350.0	5474	175	250
PM2.5	annual	348,950.0	3,905,350.0	5474	175	250
PM2.5	24-hour	349,050.0	3,905,150.0	5527	51	250
PM2.5	annual	349,023.0	3,905,240.0	5492	44	250
SO ₂	1-hour	349,043.0	3,905,145.0	5530	55	0