TCEQ Interoffice Memorandum

To: Chris Loughran, P.E.
Energy Section

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

From: Justin Cherry, P.E.
ADMT

Date: September 10, 2024

Subject: Air Quality Analysis Audit – CPV Basin Ranch Holdings LLC (RN111876330)

1. Project Identification Information

Permit Application Number: 175063
NSR Project Number: 368773
ADMT Project Number: 9300
County: Ward

Air Quality Analysis: Submitted by Haley & Aldrich Inc., July 2024, on behalf of CPV Basin Ranch Holdings LLC. Additional information was provided July, August, and September 2024.

2. Report Summary

The air quality analysis (AQA) is acceptable, as supplemented by ADMT, 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 $PM_{2.5}$ (NAAQS and Increment), 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, 3-hr, 24-hr, and annual SO_2 and 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 EPA's interim 1-hr NO_2 and 1-hr SO_2 De Minimis levels is based on the assumptions underlying EPA's development of the 1-hr NO_2 and 1-hr SO_2 De Minimis levels. As explained in EPA guidance memoranda[1,2], EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO_2 and 1-hr SO_2 NAAQS.

The $PM_{2.5}$ and ozone 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 an ozone and $PM_{2.5}$ NAAQS or $PM_{2.5}$ PSD increments based on the analyses documented in EPA guidance and policy memoranda[3].

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

[1] www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf
[2] www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf
[3] www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html

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)
SO_2	1-hr	5.93	7.8
SO_2	3-hr	5.25	25
SO_2	24-hr	2.01	5
SO_2	Annual	0.25	1
PM_{10}	24-hr	7.66	5
PM_{10}	Annual	1.19	1
$PM_{2.5}$ (NAAQS)	24-hr	6.04	1.2
$PM_{2.5}$ (NAAQS)	Annual	1.14	0.13
$PM_{2.5}$ (Increment)	24-hr	7.66	1.2
$PM_{2.5}$ (Increment)	Annual	1.19	0.13
NO_2	1-hr	78	7.5
NO_2	Annual	3	1
CO	1-hr	812	2000
CO	8-hr	317	500

The 1-hr SO_2, 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 GLCmax for all other pollutants and averaging times represent the maximum predicted concentrations over five years of meteorological data.

EPA intermittent guidance was relied on for the 1-hr NO_2 PSD De Minimis analyses. Refer to the Modeling Emissions Inventory section for details.

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 500 tpy Terry County source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.04 μg/m^3 and 0.001 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	0.88	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. 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 Terry County source, the applicant estimated an 8-hr O_3 concentration of 0.88 ppb. When the estimates of ozone concentrations from the project emissions are added together, the results are less than the De Minimis level.

B. Air Quality Monitoring

The De Minimis analysis modeling results indicate that 24-hr SO_2, 24-hr PM_{10}, 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)
SO_2	24-hr	2.01	13
PM_{10}	24-hr	7.66	10
NO_2	Annual	3	14
CO	8-hr	317	575

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

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

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 350250008 located at 2320 N. Jefferson St., Hobbs, New Mexico. The three-year average (2021-2023) of the 98th percentile of the annual distribution of the 24-hr concentrations was used for the 24-hr value (19.7 μg/m^3). The three-year average (2021- 2023) of the annual concentrations was used for the annual value (6.6 μg/m^3). The use of this monitor is reasonable based on a comparison of county-wide emissions and population, as well as the monitor being located in a more suburban/light industrial area relative to the rural area for the project site. These background concentrations were also used as part of 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 350250008 located at 2320 N. Jefferson St., Hobbs, New Mexico. A three-year average (2021-2023) of the annual fourth highest daily maximum 8-hr concentrations was used in the analysis (71 ppb). The use of this monitor is reasonable based on a comparison of county-wide emissions and population, as well as the monitor being located in a more suburban/light industrial area relative to the rural area for the project site. The proposed project is located in an attainment area for ozone and is required to obtain a PSD permit[4]. The PSD permitting program requires that proposed new major stationary sources and major modifications must demonstrate that the emissions from the proposed source or modification will not cause or contribute to a violation of any NAAQS[5]. The predicted concentrations in Table 2 demonstrate the proposed project would not cause or contribute to a violation of the NAAQS.

C. National Ambient Air Quality Standard (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 concentration 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	6	88	94	150
$PM_{2.5}$	24-hr	3	20	23	35
$PM_{2.5}$	Annual	1.14	6.6	7.74	9
NO_2	1-hr	66	58	124	188
NO_2	Annual	4	9	13	100

The 24-hr PM_{10} GLCmax is the maximum high, sixth high predicted concentration over five years of meteorological data. 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 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 primary NAAQS for 24-hr and annual SO_2 have been revoked for Ward County and are not reported above.

[4] October 26, 2015 *Federal Register* (80 FR 65292)
[5] 40 Code of Federal Regulations (CFR) 52.21(k)

EPA intermittent guidance was relied on for the 1-hr NO_2 PSD NAAQS analyses. Refer to the Modeling Emissions Inventory section for details.

A background concentration for PM_{10} was obtained from the EPA AIRS monitor 481411021 at 6767 Ojo De Agua, El Paso, El Paso County. The high, second high 24-hr concentration from the most recent three years (2021-2023) was used for the 24-hr value. The use of this monitor is reasonable based on a comparison of county-wide emissions, population, and the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

Background concentrations for NO_2 were obtained from the EPA AIRS monitor 350250008 located at 2320 N. Jefferson St., Hobbs, New Mexico. The three-year average (2021-2023) of the 98th percentile of the annual distribution of the maximum daily 1-hr concentrations was used for the 1-hr value. The annual mean concentration from 2023 was used for the annual value. The ADMT was unable to verify the reported annual concentration; however, this discrepancy does not change the overall conclusions. The use of this monitor is reasonable based on a comparison of county-wide emissions and population, as well as the monitor being located in a more suburban/light industrial area relative to the rural area for the project site.

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 Terry County source, the applicant estimated 24-hr and annual secondary $PM_{2.5}$ concentrations of 0.04 μg/m^3 and 0.001 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	7	30
PM_{10}	Annual	1	17
$PM_{2.5}$	24-hr	7	9
$PM_{2.5}$	Annual	1	4
NO_2	Annual	4	25

The GLCmax for the 24-hr $PM_{2.5}$ and 24-hr PM_{10} is the maximum high, second high 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.

ADMT evaluated predicted concentrations from the proposed project to determine if emissions could adversely affect a Class I area. The nearest Class I area, Carlsbad Caverns National Park, is located approximately 112 kilometers (km) from the proposed site.

The H_2SO_4 24-hr maximum predicted concentration of 0.67 μg/m^3 occurred approximately 212 meters from the property line towards the northwest. The H_2SO_4 24-hr maximum predicted concentration occurring at the edge of the receptor grid, 29 km from the proposed sources, in the direction of the Carlsbad Caverns National Park Class I area is 0.24 μg/m^3. The Carlsbad Caverns National Park Class I area is an additional 86 km from the edge of the receptor grid. Therefore, emissions of H_2SO_4 from the proposed project are not expected to adversely affect the Carlsbad Caverns National Park Class I area.

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 an approximate distance of 24 km from the proposed sources in the direction the Carlsbad Caverns National Park Class I area. The Carlsbad Caverns National Park Class I area is an additional 88 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 Carlsbad Caverns National Park Class I area.

F. Minor Source NSR and Air Toxics Analysis

Table 6. Site-wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (μg/m^3)	Standard (μg/m^3)
SO_2	1-hr	7	1021
H_2SO_4	1-hr	4.51	50
H_2SO_4	24-hr	1.34	15

Table 7. Total Concentrations for Minor NSR 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)
Pb	3-mo	0.001	0.07	0.071	0.15

The GLCmax is the maximum predicted concentrations over five years of meteorological data. Please note that the lead GLCmax was calculated using unit modeling and is based on the maximum 1-hr concentration rather than the 3-month average. This is conservative. See Section 3 for additional details.

A background concentration for Pb was obtained from the EPA AIRS monitor 480850029 located at 7202 Stonebrook Parkway, Frisco, Collin County. The applicant used the highest rolling 3-month average from 2021-2023. The use of the monitor is reasonable based on the applicant's review of land use, county population, county emissions, and a quantitative review of emissions surrounding the area of the monitor site relative to the project site. In addition, the monitor represents the highest lead monitored concentrations in the state.

Table 8. Generic Modeling Results

Source ID	1-hr GLCmax ($\mu g/m^3$ per lb/hr)	Annual GLCmax ($\mu g/m^3$ per lb/hr)
3B_7_C1	0.53	0.02
3B_7_C2	0.50	0.02
3B_7_C3	0.52	0.02
3B_7_C4	0.50	0.02
AB	13.57	0.33
CCGTP	178.48	1.48
CCSP1A	143.7	1.94
CCSP1B	143.70	1.93
CCSP1C	143.61	1.94
CCSP1D	143.21	1.93
CCSP1E	144.28	1.94
CCSP1F	145.01	1.94
CCSP1G	144.44	1.93
CCSP1H	144.85	1.95
CCSP2A	102.99	1.18
CCSP2B	102.64	1.17
CCSP2C	102.33	1.18

Source ID	1-hr GLCmax (µg/m^3 per lb/hr)	Annual GLCmax (µg/m^3 per lb/hr)
CCSP2D	102.92	1.18
CCSP2E	102.15	1.18
CCSP2F	103.03	1.18
CCSP2G	102.78	1.17
CCSP2H	102.81	1.18
DEHY1	8.90	0.15
DEHY2	8.86	0.15
EFP	68.63	1.14
EG1	25.73	0.47
EG2	24.36	0.56
FGH	38.59	1.30
LV1	316.59	0.83
LV2	161.23	0.95
TK14_15	232.99	2.01
TK16_17	232.99	2.01
TK1_4	124.16	1.25
TK5_6	124.16	1.25
TK7_8	232.99	2.01
TK9_10	232.99	2.01

Table 9. Minor NSR Project (Increases Only) Modeling Results for Health Effects

Pollutant & CAS#	Averaging Time	GLCmax (µg/m^3)	10% ESL (µg/m^3)
1,3-butadiene 106-99-0	1-hr	0.01	51
1,3-butadiene 106-99-0	Annual	4.23E-05	0.99

Pollutant & CAS#	Averaging Time	GLCmax ($\mu g/m^3$)	10% ESL ($\mu g/m^3$)
3-methylcholanthrene 56-49-5	1-hr	3.64E-06	0.002
7,12-dimethylbenz[a]anthracene 57-97-6	1-hr	3.24E-05	0.05
acetaldehyde 75-07-0	Annual	2.20	4.5
acetone 67-64-1	1-hr	1.04	780
acetonitrile 75-05-8	1-hr	0.003	34
acrolein 107-02-8	1-hr	0.05	0.32
ammonia 7664-41-7	Annual	6.72	9.2
anthracene 120-12-7	1-hr	0.001	0.01
benzo[a]anthracene 56-55-3	1-hr	0.001	0.05
benzene 71-43-2	1-hr	0.92	17
benzene 71-43-2	Annual	0.01	0.45
benzo[a]pyrene 50-32-8	Annual	4.47E-07	0.005
benzo[b]fluoranthene 205-99-2	1-hr	0.001	0.05
benzo[g,h,i]perylene 191-24-2	1-hr	0.001	0.05
benzo[k]fluoranthene 207-08-9	1-hr	0.0002	0.05
chrysene 218-01-9	1-hr	0.002	0.05
dibenz[a,h]anthracene 53-70-3	1-hr	0.0004	0.05
ethylbenzene 100-41-4	1-hr	0.13	2600
ethylbenzene 100-41-4	Annual	0.01	57
fluoranthene 206-44-0	1-hr	0.005	0.05
formaldehyde 50-00-0	Annual	0.23	0.33
hexane, mixed isomers 92112-69-1	1-hr	5.24	560
hexane, mixed isomers 92112-69-1	Annual	0.46	20

Pollutant & CAS#	Averaging Time	GLCmax ($\mu g/m^3$)	10% ESL ($\mu g/m^3$)
indeno[1,2,3-cd]pyrene 193-39-5	1-hr	0.0004	0.05
pentane, all isomers 92046-46-3	1-hr	2.31	5900
propylene oxide 75-56-9	1-hr	0.12	7
pyrene 129-00-0	1-hr	0.004	0.05
toluene 108-88-3	1-hr	0.87	450
xylene 1330-20-7	1-hr	0.48	220
xylene 1330-20-7	Annual	0.03	18
arsenic 7440-38-2	1-hr	0.0004	0.3
arsenic 7440-38-2	Annual	0.00003	0.0067
beryllium 7440-41-7	1-hr	3.49E-05	0.002
cadmium 7440-43-9	1-hr	0.003	0.54
cadmium 7440-43-9	Annual	0.0003	0.00033
chromium, elemental 7440-47-3	1-hr	0.004	0.36
chromium, elemental 7440-47-3	Annual	0.0004	0.0041
cobalt 7440-48-4	1-hr	0.0002	0.021
cobalt 7440-48-4	Annual	0.00002	0.00017
manganese 7439-96-5	1-hr	0.001	0.27
manganese 7439-96-5	Annual	0.0001	0.025
mercury 7439-97-6	1-hr	0.001	0.025
nickel 7440-02-0	1-hr	0.01	0.033
nickel 7440-02-0	Annual	0.001	0.0059
vanadium 7440-62-2	1-hr	0.002	2
zinc 7440-66-6	1-hr	0.03	2

Pollutant & CAS#	Averaging Time	GLCmax (µg/m^3)	10% ESL (µg/m^3)
polycyclic aromatic hydrocarbons 130498-29-2	1-hr	0.01	0.05
paraffins (petroleum), normal C5-20 64771-72-8	1-hr	2.28	350

Table 10. Minor NSR Site-wide Modeling Results for Health Effects

Pollutant	CAS#	Averaging Time	GLCmax (µg/m^3)	GLCmax Location	ESL (µg/m^3)
acetaldehyde	75-07-0	1-hr	97	E Property Line	120
ammonia	7664-41-7	1-hr	88	E Property Line	180
formaldehyde	50-00-0	1-hr	7	E Property Line	15
2-diethylaminoethanol	100-37-8	1-hr	176	E Property Line	53
2-diethylaminoethanol	100-37-8	Annual	2	E Property Line	9.6

Table 11. Minor NSR Hours of Exceedance for Health Effects

Pollutant	Averaging Time	1 X ESL GLCmax	2 X ESL GLCmax
2-diethylaminoethanol	1-hr	74	9

The GLCmax locations are listed in Table 10 above. The applicant evaluated the GLCmax as the GLCni.

The frequencies reported in Table 11 represent the maximum number of exceedances out of the five years of meteorological data evaluated. Please note that the ADMT supplemented the frequencies in Table 11 based on the GLCmax location. The applicant reported the frequencies for all locations.

3. Model Used and Modeling Techniques

AERMOD (Version 23132) was used in a refined screening mode.

Four scenarios were evaluated for the project. Scenario 1 (OS1) represents the combined-cycle gas turbines and ancillary equipment in operation with no carbon capture system (CCS) structures present. Scenario 2 (OS2) represents the combined-cycle gas turbines and ancillary equipment in operation with CCS structures present but not operating. Scenario 3 (OS3a and OS3b) represents the combined-cycle gas turbines, CCS boilers, and ancillary equipment in operation for two different CCS vendors. Scenario 4 (OS4) represents CCS boilers in startup mode, the combined-cycle gas turbines in routine and/or startup mode, and ancillary equipment in operation. Please note OS4 did not apply to SO_2, H_2SO_4, or health effects analyses.

For the four scenarios noted above, the applicant conducted a screening analysis to determine the worst-case turbine and CCS boiler combinations based on a range of load and ambient weather conditions for each pollutant and averaging time to include in the de minimis analyses. The worst-case scenario from the de minimis analyses was then used in the NAAQS and Increment analyses as applicable.

For the health effects and lead analyses, a unitized emission rate of 1 lb/hr was used to predict a generic short-term and long-term impact for each source. The generic impact was multiplied by the proposed pollutant specific emission rates to calculate a maximum predicted concentration for each source. The maximum predicted concentration for each source was summed to get a total predicted concentration for each pollutant. For the health effects analysis, the total predicted concentrations were compared to 10 percent of their respective ESLs (step 3 of the MERA guidance). All pollutants fell out by Step 3 of the MERA except for 1-hr acetaldehyde, 1-hr ammonia, 1-hr formaldehyde, and 1-hr and annual 2-diethylaminoethanol. Site-wide pollutant specific modeling was conducted for 1-hr acetaldehyde, 1-hr ammonia, 1-hr formaldehyde, and 1-hr and annual 2-diethylaminoethanol. For the lead analysis, the total predicted concentration was compared to the lead standard.

The applicant conducted the 1-hr and annual NO_2 De Minimis, NAAQS, and Increment analyses using the plume volume molar ratio method (PVMRM) model option to account for conversion of NO_X to NO_2. For all project sources except the emergency engines, the default NO_2/NO_X in-stack ratio of 0.5 was used. For the emergency engines, in-stack ratios of 1 were used to account for the intermittent nature of these sources. An in-stack ratio of 1 effectively turns off the PVMRM algorithms and utilizes the AERMOD algorithms for the specified sources. In addition, the default NO_X to NO_2 equilibrium ratio of 0.9 was used with the PVMRM model option.

The monitored ozone concentrations for the Tier 3 analysis were obtained from the EPA AIRS monitor 350250008 located at 2320 N. Jefferson St., Hobbs, New Mexico. The use of this monitor is reasonable based on a comparison of county-wide emissions and population, as well as the monitor being located in a more suburban/light industrial area relative to the rural area for the project site. The hourly ozone data were based on the highest daily 1-hr maximums for each hour of the day for the years 2021-2023 to develop the worst-case day (super day). The super day concept is a conservative modeling approach. The hourly ozone data were pared in time with the modeled hours of meteorological data.

A. Land Use

Low roughness and elevated terrain were used in the modeling analysis. These selections are consistent with the AERSURFACE analysis, topographic map, DEMs, and aerial photography. The selection of low roughness is reasonable.

B. Meteorological Data

Surface Station and ID: Winkler, TX (Station #: 23040)
Upper Air Station and ID: Midland, TX (Station #: 23023)
Meteorological Dataset: 2016, 2018-2021 for all analyses
Profile Base Elevation: 859.5 meters

C. Receptor Grid

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

The receptor design was based on the property fence line instead of the property boundary for all analyses except the unit modeling, health effects modeling, and SO_2 State Property Line modeling. This is conservative for the non-PSD analyses (i.e. H_2SO_4 State Property Line modeling).

D. Building Wake Effects (Downwash)

Input data to Building Profile Input Program Prime (Version 04274) are generally consistent with the plot plan and modeling report.

The building elevation for Building ID BLD_38 was modeled with an elevation much higher than reported for the 24-hr and annual PM_{10} O3b SIL modeling. ADMT conducted test modeling with the reported elevation and determined that this discrepancy does not change the overall conclusions.

4. Modeling Emissions Inventory

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

For the 1-hr NO_2 De Minimis and NAAQS analyses, emissions from the emergency engines and fire water pump (Model IDs EG1, EG2, and EFP) were modeled with an annual average emission rate, consistent with EPA guidance for evaluating intermittent emissions. Emissions from the emergency engines were represented to occur for no more than 100 hours per year each.

For the 1-hr NO_2 De Minimis analyses for scenarios OS1 and OS2, emissions from MSS cold starts, warm starts, and shutdown operations (Model IDs 1_CS_H1, 1_CS_H2, 1_WS_H1, 1_WS_H2, 1_SD_H1, and 1_SD_H2) were modeled with an annual average emission rate, consistent with EPA guidance for evaluating intermittent emissions. Emissions from the MSS operations were represented to occur for no more than 204 hours per year for each operation. Please note that the number of hours for these events represents the maximum number of hours per year for all startup/shutdown events combined.

For the 1-hr NO_2 De Minimis and NAAQS analyses for scenario OS4, emissions from MSS cold starts, warm starts, and hot starts operations (Model IDs 4_CS_B1 thru 4_CS_B4, 4_CS_H1, 4_CS_H2, 4_WS_B1 thru 4_WS_B4, 4_WS_H1, 4_WS_H2, 4_HS_B1 thru 4_HS_B4, 4_HS_H1, and 4_HS_H2) were modeled with an annual average emission rate, consistent with EPA guidance for evaluating intermittent emissions. Emissions from the MSS operations were represented to occur for no more than 263.52 hours per year for each operation. Please note that the number of hours for these events represents the maximum number of hours per year for all startup/shutdown events combined.

For the 24-hr PM_{10} and 24-hr $PM_{2.5}$ De Minimis, NAAQS, and Increment analyses and 24-hr SO_2 De Minimis analysis, emissions from the emergency engines and fire water pump (Model IDs

EG1, EG2, and EFP) were based on 24-hr emission rates. The modeled emission rates were based on one hour of operation per day.

For the 8-hr CO De Minimis analysis, emissions from MSS cold starts and hot starts from the turbines (Model IDs 4_CS_H1, 4_CS_H2, 4_HS_H1, and 4_HS_H2) were based on 8-hr emission rates. The modeled emission rates were based on 2.5 hours and 6.3 hours of operation in an 8-hr period, respectively. Please note that the identified sources represent the sources for the worst-case scenario; however, this refinement was used in each applicable scenario.

For the 8-hr CO De Minimis analysis, emissions from MSS cold starts and hot starts from the boilers (Model IDs 4_CS_B1 thru 4_CS_B4 and 4_HS_B1 thru 4_HS_B4) were based on 8-hr emission rates. The modeled emission rates were based on 6.4 hours and 6.9 hours of operation in an 8-hr period, respectively. Please note that the identified sources represent the sources for the worst-case scenario; however, this refinement was used in each applicable scenario.

The auxiliary boiler (Model ID AB) is limited to 4000 hours per year.

For the two CCS trains, there are two absorber stacks per train. The emissions were equally distributed between the two absorber stacks for each train. This approach was used in scenarios OS3a and OS3b.

For the tank areas (Model IDs TK1_4, TK5_6, TK7_8, TK14_15, TK9_10, and TK16_17), emissions were evaluated out of the tank location closest to the property line for each area.

Except as noted above, 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.