



Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



Misael Cabrera
Director

Submitted online via Email

June 30, 2021

U.S. Environmental Protection Agency Region 9 (ARD-2)
Air Planning Office
75 Hawthorne Street
San Francisco, CA 94105

RE: Supplemental Information for the Yuma Ozone Marginal Non-Attainment Area State Implementation Plan Emission Inventory

Dear Mr. Leers,

The Arizona Department of Environmental Quality (ADEQ) submitted a State Implementation Plan (SIP) revision for the Yuma Ozone (2015 NAAQS) marginal nonattainment area (NAA) to the EPA on December 22, 2020. The Yuma ozone Emissions Inventory Technical Support Document (EI TSD) was provided in Appendix A of the submitted plan. On January 26, 2021, ADEQ received questions from EPA regarding the SIP EI development process. Appendix A includes EPA's questions and ADEQ's responses. On April 16, 2021, ADEQ received additional questions on the EI estimates and addressed those via email. This document provides updates and supplemental information for the Yuma ozone NAA SIP EI based on additional analyses performed by ADEQ for your consideration and inclusion in the docket for EPA's action on Arizona's emission inventories.

Sincerely,

A handwritten signature in black ink that reads "JOSEPH M. MARTINI".

Joseph Martini
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Ozone Season Day Emissions

On 4/16/2021, EPA requested additional analyses to better determine whether the Yuma EI provides a comprehensive and accurate inventory of ozone season day (OSD) emissions in the Yuma NAA. The following section provides EPA questions and ADEQ's responses on the OSD emissions estimates provided in the EI TSD.

1. Point Sources: Confirm whether all point sources listed in the inventory operate seven days per week throughout the ozone season.

ADEQ contacted the 4 point sources included in the Yuma ozone EI and requested their operation schedule in 2017. Based on the information they provided, the International Paper operation schedule was 260 days per year (5 days per week), which was a little different from what was provided in the EI TSD. This change resulted in about 19% increase of VOC OSD emissions and 0.1% increase in NOx OSD emissions. Table 1 shows the revised OSD emissions for Yuma NAA point sources.

Table 1: Point Source OSD Emissions in Yuma NAA

Source	Annual Emissions (ton/yr)		Days of Operations	OSD Emissions (lb/day)	
	NOx	VOC		NOx	VOC
APS- YUCCA Power Plant	176.15	8.51	365	965.21	46.61
International Paper	4.44	11.3	260	34.15	86.92
Yuma Cogeneration Associates	8.12	0.31	365	44.51	1.71
Yuma Regional Medical Center	12.62	0.57	365	69.14	3.13
Total	201.33	20.42	—	1113.01	138.37

2. Biogenic Sources: We would not expect uneven distribution of biogenic emissions throughout the week, but both NOx and ozone biogenic emissions are expected to be higher during the ozone season. The NEI reports county-level biogenic emissions by month, which can be used to estimate ozone season day biogenic emissions within the Yuma NAA. Determine whether summing the monthly emissions in the ozone season would result in a substantial change in daily biogenic emission estimates compared to the current approach, which distributes annual emissions evenly over 365 days.

ADEQ obtained the 2017 NEI reports for county-level biogenic emissions by month. The monthly emissions from April to October were summed and then divided to the number of days in the ozone season. The OSD emissions for NOx increased by about 15% and for VOC increased by 29%. Table 2 shows the revised OSD emissions for biogenics.

Table 2: Biogenics OSD Emissions in Yuma NAA

SCC	Description	Annual Emissions, ton		Ozone Season Emissions, ton		OSD Emissions, lb/day	
		VOC	NOx	VOC	NOx	VOC	NOx
2701200000	Vegetation/Agriculture	366.04	N/A	303.42	N/A	2848.97	N/A
2701220000	Vegetation	N/A	5.90	N/A	4.07	N/A	38.18

3. Onroad Mobile: Use the weekday and weekend output options in MOVES. Sum the weekday emissions in the ozone season, and divide by the number of weekdays in the ozone season.

To address this comment, ADEQ ran MOVES2014b for on-road sources and obtained the weekday and weekend emissions for each subcategory in the Yuma ozone NAA during the ozone season months. The weekday/weekend emissions were summed and divided by the number of weekdays/weekends (152 weekdays and 61 weekends) in the ozone season. Table 3 and 4 show the results of this analysis.

Table 3: Onroad Ozone Season VOC Emissions in Yuma NAA

Source	Annual VOC, ton/yr	Ozone Season total VOC, ton	Total Weekday Emissions (ton)	Total Weekend Emissions (ton)	Weekday Emissions, lb/day	Weekend Emissions, lb/day
Combination Long-haul Truck	58.85	36.43	28.20	8.24	371.00	270.09
Combination Short-haul Truck	8.84	5.42	4.40	1.01	57.91	33.26
Intercity Bus	0.20	0.13	0.10	0.03	1.26	1.08
Light Commercial Truck	60.96	38.00	29.45	8.55	387.49	280.29
Motor Home	21.22	14.09	10.20	3.88	134.27	127.26
Motorcycle	23.19	16.71	11.61	5.10	152.80	167.07
Passenger Car	273.60	173.23	127.30	45.93	1675.04	1505.94
Passenger Truck	329.78	208.65	155.30	53.34	2043.48	1748.87
Refuse Truck	0.53	0.29	0.23	0.06	3.03	2.08
School Bus	7.20	3.99	3.02	0.97	39.68	31.87
Single Unit Long-haul Truck	14.78	9.37	7.66	1.71	100.80	55.94
Single Unit Short-haul Truck	80.58	48.31	42.47	5.83	558.85	191.26
Transit Bus	0.20	0.12	0.09	0.03	1.18	1.03
Total	879.92	554.72	420.04	134.69	5526.80	4416.01

Table 4: Onroad Ozone Season NOx Emissions in Yuma NAA

Source	Annual NOx, ton/yr	Ozone Season total NOx, ton	Total Weekday Emissions (ton)	Total Weekend Emissions (ton)	Weekday Emissions, lb/day	Weekend Emissions, lb/day
Combination Long-haul Truck	497.64	300.32	233.52	66.80	3072.62	2190.22
Combination Short-haul Truck	142.29	85.89	69.40	16.49	913.14	540.66
Intercity Bus	3.95	2.44	1.80	0.63	23.74	20.75
Light Commercial Truck	63.55	38.76	32.10	6.66	422.37	218.35
Motor Home	24.24	14.84	10.97	3.87	144.36	126.84
Motorcycle	4.93	3.68	2.74	0.93	36.08	30.61
Passenger Car	244.98	150.26	111.70	38.56	1469.70	1264.41
Passenger Truck	455.02	281.37	209.99	71.37	2763.09	2340.13
Refuse Truck	2.20	1.36	1.02	0.34	13.40	11.14
School Bus	49.16	26.29	19.47	6.82	256.12	223.70
Single Unit Long-haul Truck	88.97	55.05	44.85	10.20	590.13	334.45
Single Unit Short-haul Truck	96.13	57.71	51.80	5.91	681.56	193.76
Transit Bus	2.57	1.59	1.17	0.41	15.45	13.57
Total	1675.62	1019.55	790.53	229.01	10401.76	7508.58

4. Nonroad Mobile: For each subcategory, confirm that an even distribution of emissions throughout the week would be expected.

To address this comment, ADEQ ran MOVES2014b for non-road sources and obtained the weekday and weekend emissions for each subcategory in the Yuma County during the ozone season months. The emissions were then allocated to the NAA using the population ratio. The OSD emissions were estimated by dividing the weekday/weekend emissions by the number of weekdays/weekends (152 weekdays and 61 weekends) in the ozone season. Tables 5 and 6 show the results of this analysis.

Table 5: Nonroad Ozone Season VOC Emissions in Yuma NAA

Source	Annual VOC, ton/yr	Ozone Season total VOC, ton	Ozone Season Weekday VOC, ton	Ozone Season Weekend VOC, ton	Ozone Season Weekday VOC, lb/day	Ozone Season Weekend VOC, lb/day
Pressure Craft	28.11	22.38	10.98	11.40	144.48	373.69
Commercial Equipment	13.95	9.26	7.25	2.00	95.42	65.73
Agricultural Equipment	11.41	8.53	6.96	1.57	91.57	51.49
Lawn and garden Equipment	95.90	71.51	49.77	21.74	654.88	712.74
Industrial Equipment	1.47	0.90	0.71	0.19	9.30	6.23
Construction and Mining Equipment	26.91	16.88	13.86	3.03	182.31	99.20
Recreation Equipment	143.12	106.29	62.72	43.57	825.25	1428.43
Total	320.87	235.74	152.24	83.49	2003.22	2737.49

Table 6: Nonroad Ozone Season NOx Emissions in Yuma NAA

Source	Annual NOx, ton/yr	Ozone Season total NOx, ton	Ozone Season Weekday NOx, ton	Ozone Season Weekend NOx, ton	Ozone Season Weekday NOx, lb/day	Ozone Season Weekend NOx, lb/day
Pressure Craft	6.97	5.54	1.65	3.89	21.72	127.40
Commercial Equipment	9.12	5.69	4.73	0.97	62.18	31.64
Agricultural Equipment	103.59	77.93	64.74	13.19	851.90	432.42
Lawn and garden Equipment	13.89	10.12	7.21	2.91	94.87	95.55
Industrial Equipment	10.81	6.86	5.22	1.64	68.62	53.82
Construction and Mining Equipment	142.79	93.61	77.76	15.85	1023.14	519.68
Recreation Equipment	6.82	4.88	2.69	2.19	35.43	71.76
Total	293.99	204.63	164.00	40.63	2157.86	1332.27

5. Nonpoint Sources: Revisit assumptions used to temporally distribute emissions for each subcategory. For subcategories where these assumptions can be improved, use any available data, information or assumptions to account for uneven distribution of emissions throughout the week.

ADEQ reviewed the assumptions used to estimate the OSD for nonpoint source sectors. Unfortunately, at this point we don't have any additional information to improve those assumptions. This is due to the lack of local activity data for the nonpoint sectors in the NAA at the time of preparation of EI documents. However, ADEQ used all the available resources such as Maricopa periodic EI reports, Pima County EI reports, EPA references, etc. to accurately estimate the OSD emissions where ever possible. This was consistent with the methodologies described in the Yuma ozone IPP and previous EI TSDs, which were reviewed and approved in previous communications and public comment periods.

We understand the importance of improving the nonpoint OSD emissions to reflect a more accurate estimation of emissions. We have considered that in our periodic emissions inventory report templates by asking the sources about their operation schedule during the ozone season. Therefore, we expect to have more accurate data in the future EI periodic reports and will revise the OSD estimates accordingly.

6. Summary Results

The overall summary of the emissions inventory for the Yuma ozone NAA is presented in Table 7. For the mobile onroad and nonroad sources, ozone season day emissions are presented as the most conservative, i.e., the highest, estimate among weekend and weekday emissions.

Table 7: Summary of VOC and NOx Emissions in in Yuma NAA

Source Type	Annual Emissions (ton/yr)		OSD Emissions (lb/day)	
	VOC	NOx	VOC	NOx
Point	20.42	201.33	138.37	1113.01
Area (Nonpoint)	1706.53	65.90	15007.04	1275.17
Mobile On-road Total	879.92	1675.62	5526.80	10401.76
Non-road Mobile Total	320.87	293.99	2737.49	2157.86
Biogenics	366.04	5.90	2848.97	38.18
Total	3293.78	2242.74	26258.67	14985.98

Appendix A: ADEQ's Response to EPA's Comments on Yuma Ozone SIP EI Development Process

This section includes EPA's questions and ADEQ's responses on the Yuma ozone NAA SIP EI development processes described in the EI TSD.

- **Clarification of ADEQ's selection of ozone season and handling of weekday emissions; clarification of months selected and rationale for ozone season duration:**
 - The ozone season for the Yuma NAA was selected from April 1st through October 31st. This selection was based on the ADEQ's 2015 Ozone NAAQS Boundary Recommendations and Technical Support Document that was submitted to EPA on 9/27/2016. The boundary recommendations for Yuma ozone NAA was approved and published in the Additional Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards rule on 6/4/2018 (40 CFR Part 81, Vol. 83, No. 107).
 - **Present documents to determine if/how weekday emissions were considered.**
 - For the point sources, ozone season day emissions were assumed to be average daily emissions (i.e., annual emissions divided by 365). This is a reasonable assumption because the identified point source operations are not seasonal and were not shut down for significant periods of time during 2017.
 - For the nonpoint sources, ozone season day emissions were derived from the estimated annual emissions. For each sector, the available information such as operating schedules, EI reports, and etc. were used to estimate ozone season day emissions. For example, if the activity occurred six days per week, and relatively uniform throughout the year, the annual emissions were divided by 312 (6 days/week × 52 weeks/year) to derive emissions for an ozone season day in the NAA. If such information was not available, the activity was assumed to occur uniformly throughout the year. Therefore, average season-day emissions was estimated by dividing the annual emissions by 365. In the Yuma ozone EI TSD, for each sector, it is explained how the ozone season day (OSD) emissions were estimated.
- **Describe QA/QC process on source-submitted emissions prior to ADEQ's submittal of data to NEI:**
 - For the point source data that we submit for the NEI, we have a detailed QAPP (attached) which Region 9's QA management team recently approved.

- For the nonpoint, mobile, and event sector data that we submitted for the 2017 NEI, we followed a very basic process (our process for the 2020 NEI will be a little more systematic, since we had a Kaizen problem solving event a while back), as follows. Whenever EPA's NOMAD committee released a new tool or dataset providing their default county-by-county estimates (including for Yuma County), ADEQ staff reviewed the default estimation methodology to make sure we felt all of the underlying assumptions were sound for Arizona counties. If so, we reviewed the default input data and, if we had better local data available, we submitted those improved data to EPA. Sometimes we were happy with both the methodology's default assumptions and its default input data (e.g., for residential wood combustion) in which case we submitted nothing. On the other hand, if we felt that the assumptions were unsound, we told NOMAD so, and worked on either of two possible resolutions:
 - Revising the methodology/adding adjustment factors to allow flexibility for individual counties, or
 - Declining to use EPA's emissions estimates and simply submitting our own estimates using a more representative methodology.

For the 2017 NEI, we only invoked #2 for certain types of prescribed forestry burns, which isn't an issue in that mostly-urban portion of Yuma. However, we did invoke #1 a few times, mainly related to particulate matter estimation for construction dust controls in Pinal, unpaved road dust assumptions in Pima, and most importantly for ag tilling emissions in Yuma.

For example, for the ag tilling emissions in Yuma, NOMAD's contractor had compiled a list of the most-grown crop types nationally, and used only those crops to estimate certain agricultural emissions for each county, such as tillage dust. However, this approach was completely inadequate for Yuma. Most of the country's farms grow commodity crops, such as soy, cotton, wheat, corn, and other cereal grains. However, Yuma grows produce almost exclusively, and most types of produce were not on the default data list. So the majority of the ag activity in Yuma wasn't even represented. We worked with NOMAD to make sure the contractor would add an extra step to their methodology to accept the additional crop type data we sent them to represent produce. We also provided them with control/emission factor parameters for those new crops.

- **Describe QA/QC process throughout EI development:**

We follow an internal procedure for the quality check of EI methodologies and calculations for the SIPs. This procedure includes:

- Preparing an Inventory Preparation Plan (IPP) at the beginning of EI development to identify the methodologies for EI estimates. The IPP is reviewed by EPA and necessary changes are made based on EPA feedback.
- Peer and management review of the EI TSD and calculations is conducted.
- Public & EPA review during the public comment period also provides a level of quality assurance.
- **Explain handling of point sources vs. nonpoint sources in the Yuma NAA and how ADEQ prevented double counting of point and nonpoint sources:**
 - For the nonpoint sources, ADEQ evaluated all the sectors included in the 2017 NEI for the Yuma County. If some of those activities were not existing in the NAA, the emissions were assumed to be zero.
 - For the point sources, ADEQ included all point sources from the NEI (which includes HAP and/or CAP major sources and Title V categorical sources, plus a variety of facilities that report directly to federal agencies, such as airports and power plants) as well as any other minor point sources which hold ADEQ air permits. Holding an ADEQ air permit is what triggers the requirement to submit an annual EI report to us.

Given that, there are some standard PTE thresholds for which facilities are required to hold ADEQ air permits, and thus count as point sources in our EI process. The thresholds are mostly listed in A.A.C. R18-2-301.131. For example, if a facility has an annual PTE of 40 or more tons of NO_x, they're required to hold an ADEQ air permit regardless of their actual annual emissions.

The advantage of this methodology is that we include whatever minor point source EI data we have available to construct the SIP EI. However, since we included minor sources which were not submitted to the NEI, we evaluated the nonpoint institutional/industrial fuel combustion emissions estimates to reconcile out the NO_x and VOC emissions from the sources that we included in addition to the standard/major sources reported as point sources for the NEI. The reconciliation was performed by reviewing the 2017 emission reports and deducting those facilities' NO_x and VOC emissions from the corresponding nonpoint subtotals in the NAA.

It should be noted that for the Yuma NAA, the NO_x and VOC emissions from the minor point sources are negligible as compared with thousands of tons per year of total emissions from the nonpoint sources.

- **Other EPA questions:**
 - Difference between “Industrial” and “Commercial/Industrial” fuel combustion area source categories?
 - That was a mistyping error. It should be commercial/institutional
 - Why was aircraft surface coating included as an area source subcategory?
 - That sector was included to be consistent with 2017 NEI sectors. However, as explained in the EI TSD, there was no emissions for this sector in the NAA.