UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 3 2017

MEMORANDUM

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

SUBJECT: Distribution of the EPA's modeling data used to develop illustrative examples in the draft *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program.*

FROM: Tyler Fox, Group Leader
Air Quality Modeling Group
Air Quality Assessment Division

TO: Regional Air Program Managers, Regions 1 – 10

The Environmental Protection Agency (EPA) is providing information on how to request and obtain modeling data presented in the draft technical guidance, *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program.* These data will assist state, local, and tribal air agencies, as well as the public, in replication of the EPA's modeling for purposes of testing, verifying, and further developing public comment on the draft guidance prior to the recently extended comment period deadline of March 31, 2017. To facilitate this process, we are also providing some additional information on the location for each of the hypothetical sources modeled by the EPA and providing several corrections to data tables within the draft guidance.

Request for Modeling Data

Due to the large amount of data generated in developing illustrative single source impacts provided in this draft guidance document, those interested in the model inputs and outputs will need to provide external hard drive(s) for the data transfer. Table 1 below provides the approximate size of the entirety of model inputs, output, and code for the different components of the single source assessments.

Table 1. Size of Modeling Data for Hypothetical Sources by Geographic Area

Dataset	Description	Total Data Size
A	Eastern U.S. 12 km CAMx inputs, output, code	~4.5 TB
B	Central U.S. 12 km CAMx inputs, output, code	~4 TB
C	Western U.S. 12 km CAMx inputs, output, code	~3.5 TB
D	Detroit and Atlanta 4km CMAQ inputs, output, code	~350 GB
E	California 4 km CMAQ inputs, output, code	~1.2 TB

Requests for model inputs, model outputs, model code, and model application scripts should be electronically submitted to Mr. George Bridgers of the EPA's Air Quality Modeling Group at *bridgers.george@epa.gov*. Any questions regarding the draft guidance should also be addressed electronically to Mr. Bridgers.

In addition, to facilitate the use of these model inputs and outputs, we are providing Table 2 below with the coordinates for the hypothetical sources modeled as part of the illustrative examples in the draft guidance. This information is also available upon request in spreadsheet format.

Table 2. Coordinate locations for each of the hypothetical sources modeled by EPA in the draft MERPs guidance.

stack_ID	latitude	longitude	domain
1	46.7725	-67.8503	EUS
2	43.3666	-70.5801	EUS
3	42.1386	-71.2341	EUS
4	42.5816	-72.4589	EUS
5	40.8194	-73.9090	EUS
7	42.8772	-77.6033	EUS
8	40.0091	-77.1106	EUS
9	36.9186	-77.7067	EUS
10	34.0830	-79.1872	EUS
11	42.8224	-82.8723	EUS
12	40.5407	-81.3958	EUS
13	36.3007	-81.3737	EUS
14	32.9727	-81.4073	EUS
15	46.5701	-87.3947	EUS
16	43.3191	-85.3683	EUS
17	40.6229	-85.5888	EUS
18	36.8285	-85.8305	EUS
19	32.8477	-85.8094	EUS
1	47.2866	-101.8791	WUS
2	46.8611	-101.9251	WUS
3	40.6215	-104.0374	WUS
4	37.6850	-102.9943	WUS

5	33.3688	-102.1459	WUS
6	47.3667	-104.4467	WUS
7	45.2994	-105.8948	WUS
8	40.8414	-105.8259	WUS
9	37.9651	-106.2341	WUS
10	32.7567	-105.7669	WUS
11	45.7857	-108.2070	WUS
12	40.4070	-110.6183	WUS
13	37.9051	-109.8993	WUS
14	33.4689	-110.7889	WUS
15	40.1101	-111.9363	WUS
16	37.6083	-113.0923	WUS
17	33.3996	-113.4082	WUS
18	45.7895	-119.4748	WUS
19	39.9410	-118.7482	WUS
20	36.3243	-119.4038	WUS
21	34.6962	-118.4135	WUS
22	48.4664	-122.5590	WUS
23	45.9383	-121.1914	WUS
24	39.9197	-121.2634	WUS
25	37.2744	-120.7077	WUS
26	35.3562	-119.5079	WUS
1	41.3802	-87.1850	CUS
2	38.2549	-86.7241	CUS
3	35.2912	-86.8975	CUS
4	32.5220	-86.5498	CUS
5	30.2687	-85.7002	CUS
6	41.1999	-89.4463	CUS
7	38.0783	-89.5467	CUS
8	35.1240	-90.0021	CUS
9	32.1774	-89.3449	CUS
10	30.0919	-89.8790	CUS
11	41.6739	-92.0604	CUS
12	38.0141	-93.0056	CUS
13	34.7237	-92.2748	CUS
14	32.4762	-92.7109	CUS
15	30.2409	-92.6165	CUS
16	41.3638	-96.1551	CUS
17	38.7457	-94.9488	CUS
18	35.7506	-95.5072	CUS
19	32.3140	-95.5558	CUS
20	29.5924	-95.4179	CUS
21	40.6732	-98.3270	CUS

22	38.1211	-97.8991	CUS
23	35.4629	-97.9130	CUS
24	32.6100	-97.7358	CUS
25	29.5533	-97.9909	CUS
1	34.0505	-117.7324	California
2	34.0651	-118.2281	California
3	33.9044	-117.3352	California
4	35.3908	-119.0259	California
5	35.5137	-119.3375	California
6	35.1978	-118.8765	California
1	41.9255	-83.6211	Detroit
1	33.6461	-84.6528	Atlanta

Corrections to Data Tables and Associated Example Calculations

To facilitate the ongoing public review of the EPA modeling, we are providing the following corrections to data tables and associated examples within the guidance.

- Acknowledgement that the ozone and $PM_{2.5}$ impacts in Appendix Tables A-1, A-2 and A-3 do not include hypothetical source #6 in the eastern U.S. group because the location coordinates of the source placed it offshore. Thus, calculations within the draft guidance do not include the modeled impacts from this hypothetical source.

- Updates to Table 7.1 that reflect the removal of source #6 in the eastern U.S. region that was inadvertently included in the data distribution even though it was located over water and not relevant for this analysis. Further, all MERPs were re-estimated using applicable critical threshold values for each source provided in the Appendices for ozone (1.0 ppb), daily PM (1.2 $\mu g/m^3$), and annual PM (0.2 $\mu g/m^3$). The revised Table 7.1 is provided below.

Table 7.1 Most Conservative (Lowest) Illustrative MERP Values (tons per year) by Precursor, Pollutant and Region. Note: illustrative MERP values are derived based on EPA modeling (as described in section 4) and critical air quality thresholds (as described in Section 5).

Precursor	Area	8-hr O3	Daily PM	Annual PM
NOX	CUS	126	1,693	5,496
	EUS	170	2,295	10,144
	WUS	184	1,075	3,184
SO2	CUS		238	839
	EUS		628	4,013
	WUS		210	2,289
VOC	CUS	948		
	EUS	1,159		
	WUS	1,049		

- Correction to the associated text for the example scenario A to reflect the updated MERP values, i.e.,

Example calculation for additive secondary impacts on 8-hr daily maximum O_3:

(72 tpy NO_X from source/170 tpy NO_X 8-hr daily maximum O_3 MERP) + (130 tpy VOC from source/1159 tpy VOC 8-hr daily maximum O_3 MERP) = .43 + .11 = .54 * 100 = 54%

Example calculation for additive secondary impacts on daily $PM_{2.5}$:

(310 tpy NO_X from source/1075 tpy NO_X daily $PM_{2.5}$ MERP) + (75 tpy SO_2 from source/210 tpy SO_2 daily $PM_{2.5}$ MERP) = .29 + .36 = .65 * 100 = 65%

Example calculation for additive secondary impacts on annual $PM_{2.5}$:

(310 tpy NO_X from source/3184 tpy NO_X annual $PM_{2.5}$ MERP) + (75 tpy SO_2 from source/839 tpy SO_2 annual $PM_{2.5}$ MERP) = .097 + .089 = .19 * 100 = 19%

- Corrected calculations in the text for the $PM_{2.5}$ analysis within example scenario C to update the referenced MERP values for daily $PM_{2.5}$, i.e.,

A hypothetical source considered more similar (e.g., WUS region, source 16 with elevated release as shown in Appendix A) has a lowest NO_X MERP for daily $PM_{2.5}$ of **20,000 tpy** and SO_2 MERP for daily $PM_{2.5}$ of **6,667 tpy**, which are both much larger than the increase in emissions of the project such that the source's impact on $PM_{2.5}$ would be expected to be less than the critical air quality threshold.

- Correction to Table A-2 to provide the daily $PM_{2.5}$ impacts of hypothetical source #5 that were inadvertently omitted:

Precursor	Area	Emissions (tpy)	Height	Source	FIPS	State	County	Max. Value (ug/m3)
NOx	CUS	500	L	5	12005	Florida	Bay	0.302
NOx	CUS	1000	H	5	12005	Florida	Bay	0.391
NOx	CUS	1000	L	5	12005	Florida	Bay	0.659
NOx	CUS	3000	H	5	12005	Florida	Bay	1.865
NOx	WUS	500	H	5	48445	Texas	Terry	0.038
NOx	WUS	500	L	5	48445	Texas	Terry	0.082
NOx	WUS	1000	H	5	48445	Texas	Terry	0.072
NOx	WUS	3000	H	5	48445	Texas	Terry	0.205
SO2	CUS	500	L	5	12005	Florida	Bay	1.409
SO2	CUS	1000	H	5	12005	Florida	Bay	1.967
SO2	CUS	1000	L	5	12005	Florida	Bay	3.524
SO2	CUS	3000	H	5	12005	Florida	Bay	11.021
SO2	WUS	500	H	5	48445	Texas	Terry	0.068
SO2	WUS	500	L	5	48445	Texas	Terry	0.277
SO2	WUS	1000	H	5	48445	Texas	Terry	0.122
SO2	WUS	3000	H	5	48445	Texas	Terry	0.356

- Correction to Table A-3 to provide the annual average $PM_{2.5}$ impacts of hypothetical source #5 that were inadvertently omitted:

Precursor	Area	Emissions (tpy)	Height	Source	FIPS	State	County	Max. Value (ug/m3)
NOx	CUS	500	L	5	12005	Florida	Bay	0.0146
NOx	CUS	1000	H	5	12005	Florida	Bay	0.0091
NOx	CUS	1000	L	5	12005	Florida	Bay	0.0364
NOx	CUS	3000	H	5	12005	Florida	Bay	0.0428
NOx	WUS	500	H	5	48445	Texas	Terry	0.0011
NOx	WUS	500	L	5	48445	Texas	Terry	0.0037
Nox	WUS	1000	H	5	48445	Texas	Terry	0.0021
NOx	WUS	3000	H	5	48445	Texas	Terry	0.0056
SO2	CUS	500	L	5	12005	Florida	Bay	0.0875
SO2	CUS	1000	H	5	12005	Florida	Bay	0.0432
SO2	CUS	1000	L	5	12005	Florida	Bay	0.2384
SO2	CUS	3000	H	5	12005	Florida	Bay	0.21
SO2	WUS	500	H	5	48445	Texas	Terry	0.0019
SO2	WUS	500	L	5	48445	Texas	Terry	0.0039
SO2	WUS	1000	H	5	48445	Texas	Terry	0.0037
SO2	WUS	3000	H	5	48445	Texas	Terry	0.0102