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Subject: Jacksonville Lime Tier 3 Modeling Protocol
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Attachments: Carmeuse Lime NO Emissions Test Report.pdf
Peischl 2010 topdown power plant emissions TEXAQS.pdf
Offsite NOx Source Tables.pdf

Stan:

Following is some information addressing some of your questions on the Tier 3 modeling procedures that were raised during our teleconference on July 17, 2013. This information should make it easier to assess our proposed methodology for performing the 1-hour NAAQS demonstration using the OLM Tier 3 method.

Ozone Background

The hourly ozone values we are proposing to use in the Tier 3 modeling were measured at the Sheffield Elementary School monitor (ID 120310077). The distribution of missing values for the five year period are as follows:

Period	Total Number of Missing Values
All Years	2,379
2006	393
2007	744
2008	605
2009	312
2010	325

The distribution of consecutive missing values are as shown below:

Number of Missing Values in Period	Periods with this Number of Missing Values	Total Number of Missing Values
1	44	44
2	208	416
3	221	663
4	34	136
5	36	180
6	11	66
7	5	35
8	11	88
9	8	72
10	6	60

11	5	55
12	2	24
13	2	26
14	4	56
15	0	0
16	2	32
17	2	34
18	0	0
19	3	57
20	2	40
123	1	123
172	1	172
Total	608	2,379

We are proposing to fill in the missing values uniformly using 94 ppb, which is the average of the yearly maximum monitored concentration.

Year	Maximum Ozone Value (ppb)	Average Ozone Value (ppb)
2006	96	28.9
2007	100	28.2
2008	95	27.7
2009	93	24.8
2010	87	26.5
Average	94	27.2

As can be seen the average values have been decreasing since 2007, and use of this value should be reasonably conservative. Also, the proposed value is 16% higher than the average of the maximum values from the latest three years of data.

NO2 Hourly Background Values

The only NO2 monitor in Duval County is the Kooker Park monitor (ID 120310032) located approximately 0.75 miles southwest of the Jacksonville Lime site. For missing values, we simply propose to use the latest design value of 40 ppb (75.24 ug/m3) for the most recent available three years (i.e., 2010 through 2012). The 98th percentile values are 44, 39, and 37 ppb for 2010, 2011, and 2012, respectively. This value can be justified since it is the same that would be used if only a single background value were incorporated in the analysis.

NO2:NOx Ratios

We propose to use a NO2:NOx ratio of 0.05 for the lime kiln. This value is supported by the stack test that Carmeuse performed on its Strasburg, Virginia facility (see Air Emissions Compliance Test Report dated December 8, 2011 included in the March, 2013 Supplemental Modeling Protocol).

The average of four tests resulted in an NO2:NOx ration of 0.05. The use of this ratio is also bolstered by a more recent test of a kiln at the Carmeuse River Rouge facility in Michigan. On Page 18 of the attached report the average test concentrations results in an NO2 to NOx ratio of 0.04. This further supports our proposed ratio of 0.05 for the Jacksonville Lime kilns.

Attached is a study that was supplied by FDEP showing NO2:NOx ratios for a coal fired boiler (see pages 12 to 14 of the attached report). The nighttime measurements were made by flying transects at 18 to 60 kilometers downwind of the Oklaunion Power Plant. This coal fired power plant has a single stack. It was concluded that the NO2:NOx ratios were approximately 6%. It is proposed to apply the ratio of 0.1 to the coal fired boilers at the Jacksonville Electric Authority (JEA) Northside plant. In order to show compliance with the NO2 1-hour standard, it should be sufficient to only apply this ratio to those specific JEA coal fired units, but it may be applied to others on a case-by-case basis.

Inventory of Offsite Sources

Attached tables contain the offsite facilities and their potential emissions. Also shown is the distance and direction of each from the Jacksonville Lime facility. Those facilities within the distance of significant impact and having potential NOx emissions greater than or equal to 100 tpy will be included in the cumulative NO2 modeling. The remaining minor sources will be included on a case-by-case basis, i.e., if they are within 1 km of the site and have sufficient information to model. Although two minor source fuel terminals (i.e., the Jax Bulk Terminal and the Omega Partners Jacksonville facility) were within 1 km of the site, hourly emissions and stack parameters were not available. The potential NOx emissions of these sources are relatively small, and they will only operate during loading operations. The two minor source lists are sorted by potential emissions and distance from Jacksonville Lime.

Please feel free to contact me to discuss further or request further information.

John