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Subject:	Review Comments - Supplemental Air Quality Dispersion Modeling Protocol (March 2013) and 8 August 2013 Email (Jacksonville Lime Tier 3 Modeling Protocol)
Date:	Wednesday, August 21, 2013 7:09:38 AM

John,

The following are my review comments on the above indicated supplemental air quality modeling protocol to be used in support of a PSD permit application for the construction and operation of the lime manufacturing facility in Jacksonville, FL.

I have also reviewed your 8 August 2013 email providing additional Tier 3 modeling protocol items. Some of the procedures and information in this email conflict with those provided in the March 2013 Supplemental Air Quality Dispersion Modeling Protocol. Review comments on the 8 August email are provided separately in Attachment 1 to this email.

Non-Default Tier 3 NO_2 Modeling Procedures

This supplemental protocol includes the use of the non-default Tier 3 Ozone Limiting Method (OLM) for the assessment of NO_2 impacts. The following addresses the required information needed for approval of the alternate, non-default, detailed Tier 3 screening modeling technique for use in the nitrogen dioxide (NO_2) impact assessments.

Required Justification – The basis for EPA approval of a Tier 3 procedure is provided in the Tyler Fox clarification memoranda: Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard (March 1, 2011), and Applicability of Appendix W Guidance for the 1-hour NO_2 National Ambient Air Quality Standard (June 28, 2010). The content required for case-by-case approval of a Tier 3 non-regulatory default option, and any other non-regulatory option, are provided in 40 CFR 51 Appendix W Guideline on Air Quality Models (GAQM). The Tyler Fox memorandum noted that items i and iv of Appendix W, Section 3.2.2, paragraph (e) may be fulfilled by existing demonstrations and documentation. The applicability of the Tier 3 procedures to the project, the availability of needed data bases to perform the analyses, and the methods and procedures to be used in the application of the proposed Tier 3 technique are project specific and need to be provided. The appropriate and representative data bases required for approval include in-stack NO_2/NOx ratios, monitored background concentrations, and ambient ozone concentrations. The methods used to develop these data bases (e.g., data completeness, data replacement, etc.) and the proposed temporal/spatial application procedures are also important considerations.

Specific Tier 3 Procedure – The March 2013 protocol indicates the OLM Tier 3 procedure is proposed for this application.

NO_2/NOx In-Stack Ratios – The following comments are associated with the proposed

NO_2/NOx in-stack ratio to be used in the application of the Tier 3 technique for the NO_2 compliance modeling.
- The protocol indicates the modeling approach will follow guidance provided in the GAQM and the clarification memoranda. Therefore, in the absence of more appropriate, source-specific information on particular in-stack NO_2/NOx ratio, the 1 March 2011 memorandum default in-stack ratio of 0.50 should be used.
- An in-stack ratio of 0.14 is proposed for the lime kilns. This value is based on stack test data of similar lime kilns provided in Appendix C. Appendix C just contains a list of ratios associated with apparent test runs 1-4. Because information on the stack tests are not available to allow evaluation of the appropriateness of these ratios for the Jacksonville lime kilns (e.g., type of kilns, load and run conditions during tests, appropriateness of the test results to other ambient conditions, etc.), recent separate emission tests were performed to verify and substantiate the proposed ratio. Documentation of these substantiating engineering tests was provided in the Entec Services, Inc. 4 April 2013 report prepared for Carmeuse Lime and Stone Company.
- The proposed use of the average of all in-stack NO_2/NOx ratios reported in the Technology Network SCRAM database for all offsite emission sources included in the cumulative NAAQS compliance modeling is not appropriate. This database contains reported, but unconfirmed, in-stack ratios for many different emission units. Specific information on the emission units (e.g., manufacturer, power rating, type of control, etc.) are provided for each entry to allow evaluation of the similarity of an entry to a particular application. The use of an in-stack ratio derived from "the average of an average plus two standard deviations of the in-stack ratios for both the boilers and combustion turbines, as well as doubling the reported average in the JBR studies" is not a source-specific assessment for a particular application. The default in-stack ratio should be used when an appropriate source-specific ratio is not available.

<u>Ozone Measurements</u> – The following comments are associated with the proposed ozone database for use with the Tier 3 technique.
- Ozone measurements from the nearest ozone monitor have been proposed. The nearest monitoring station is within 1 mile of Jacksonville Lime at the Durval County Sheffield Elementary School.
- The proposed missing data replacement procedure is linear interpolation from hours about the gaps of 3 or fewer observations, and data from the previous or the following day for gaps of 4 hours or more missing observations. The number and lengths of gaps, time of day they occur, and time of year all contribute to the appropriateness of a proposed missing data procedure. A summary of this information should be provided to allow evaluation of the appropriateness of proposed replacement procedure [Note: The characteristics of the missing data gaps and an alternate replacement procedure are provided in the 8 August 2013 email – see Attachment 1.]

<u>Background NO_2 Concentrations</u> – The following comments are associated with the proposed background monitoring NO_2 data that will be used in the cumulative 1-hour NO_2 NAAQS compliance assessment.
- The nearest NOx monitoring station (i.e., within 1 mile: Durval County Sheffield Elementary School) was selected for use for the Jacksonville Line facility.
- The data characteristics for the selected period of 2006 to 2010 should be provided (e.g., completeness percentage, description of missing data, etc.). This information is important in the evaluation of the appropriateness of this data record for this application.

- The proposed procedure of using the 98th percentile of the daily maximum 1-hour NO_2 value averaged over 3-years (2009-2011) is appropriate and will be the basis for approval of the Tier 3 procedure.
- Temporal pairing of the NO_2 background observations is not an approved procedure. Additional information and justification will be needed if temporal pairing of NO_2 background observations are proposed.

General (Non-Tier 3) Air Dispersion Modeling Procedures

The following comments are associated with proposed air quality modeling procedures not applicable to approval of the non-default Tier 3 method for NO_2.

Exemption of 2 Gas-fired Emergency Generators – The basis for the excluding the 2 gas-fired generators should be provided. The anticipated routine maintenance operation should be provided as well as the emission rates to demonstrate their operations will not affect the design concentration or compliance assessment.

PSD Emission Sources – Because NOx is a precursory for both ozone and PM2.5, the modeling protocol should explain why these pollutants have not been considered.

Inventory of Other Emission Sources – The following comments are associated with the proposed inventory of other emissions sources used in the cumulative compliance modeling.
- The protocol appears to only address the NOx inventory for the 1-hour standard. The inventory for the annual standard as well as PSD increment assessment should be included in the protocol.
- The protocol should address how the appropriate NOx or NO_2 emission rates will be obtained to address each ambient standard (e.g., 1-hour and annual NO_2 standards).
- The protocol indicates the significant impact area is a circle of 9 km radius from the proposed project. The air quality modeling provided in support of the PSD permit application should include the modeled input parameters and SIA modeling results.
- The reason only major (i.e., 100 TPY NOx) sources, rather than all NOx emissions sources, are included in the modeled inventory of other sources within the SIA should be provided.
- NOx emission sources beyond the SIA were indicated to be included if expected to contribute significantly. More specific information is needed on the procedure used to determine significant impact and at what locations (e.g., the SIA).
- To allow evaluation of the selection process the PSD application should include the final modeled inventory of other emission sources as well as the unedited emission source inventory from which the modeled sources were selected.

Please let me know if you have any questions.

ATTACHEMENT 1

Review of 8 August 2013 Email
Jacksonville Lime Tier 3 Modeling Protocol

The following provides review comments on the 8 August 2013 email containing additional information on the Jacksonville Lime's request for approval of the non-default Tier 3 Ozone Limiting Method (OLM) for the assessment of NO_2 impacts. This email contains some procedures conflicting with those proposed in the March 2013 Supplemental Air Quality Dispersion Modeling Protocol.

Ozone Background – The following comments are associated with the proposed procedures to provide a complete record of ozone measurements for temporal pairing for the OLM Tier 3 procedure.

- The 8 August 2013 email appears to change the missing data replacement procedure. All missing ozone values were proposed to be replaced uniformly with the 5-year average of the maximum monitored concentration (i.e., 94 ppb).
- The characteristics of the missing data gaps are provided. Because missing gaps of 4 or more values include many periods in excess of 8 missing values, the previously proposed procedure of using prior or following day's measurements is not appropriate.
- The years 2006 - 2008 have the largest annual missing data periods as well as the highest measured ozone levels. Therefore the use of the 5-year average maximum concentration to replace all missing observations does not appear appropriate. The following are suggested alternate procedures that appear more appropriate:
    - Use each year's maximum measured value to replace all missing values in that year.
    - Use each year's maximum measured seasonal or monthly concentration as replacement value for the applicable matching missing measurements.
    - For each year develop seasonal or monthly diurnal distribution of maximum measured values from which replace values matching the missing hours can be obtained for the appropriate season or month.

NO_2 Hourly Background Values - The following comments are associated with the proposed procedures to provide a complete record of NO_2 measurements.

- The March 2013 protocol indicates the 5-year (i.e., 2006-2010) design value will be used as the background NO_2 concentration. Because a single background value will be used, a complete hourly data record is not needed for the NO_2 background measurements.

NO_2/NOx Ratios - The following comments are associated with the proposed NO_2/NOx ratios for the Tier 3 procedure.

- The March 2013 modeling protocol proposed the use of an average of the maximum NO_2/NOx ratio stack test runs (i.e., 0.14) for the project kilns. The use of the smaller overall average NO_2/NOx ratio of 0.05 is not appropriate without more specific matching of stack tests to planned kiln performance parameters.
- The NO_2/NOx ratios referenced in the 2010 Journal of Geophysical Research paper "A top-down analysis of emissions from selected Texas power plants during TexAQS 2000 and

20006" has not been demonstrated appropriate for the coal-fired boilers at the Jacksonville Electric Authority facility. This reference does not provide any additional source-specific in-stack ratio information applicable for the Jacksonville Electric Authority boilers. Therefore, the March 2013 protocol procedure of using the 0.5 default NO_2/NOx ratio is appropriate.

Inventory of Offsite Sources – The information provided in this email do not change the March 2013 proposed procedures. Therefore, the review comments provided on March 2013 Supplemental Air Quality Dispersion Modeling Protocol are applicable to the inventory of offsite sources provided in this email.

For the Tier 3 modeling procedure approval, the items associated with the proposed NO_2/NOx ratios, the ozone data replacement procedures, and the NO_2 background measurements must be resolved. The other general modeling procedures and inventory items are important to the ambient air quality modeling assessment supporting the PSD permit application but not the application of the NO_2 Tier 3 modeling procedure.

A conference call to clarify and discuss these items may help expedite resolution.
Thanks…sjk

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