Guidance Concerning Other Information Used for Permitting Requirements in Demonstrating Emissions Do Not Interfere With Attainment or Maintenance of any State or Federal Standard

Introduction

SC Regulation 61-62.1 requires that facilities requesting a construction permit (see R. 61-62.1 Section II.C.3.n) or operating permit renewal (see R. 61-62.1 Section II.H.4.i) submit an "air dispersion modeling analysis or ***other information*** (emphasis added) demonstrating that emissions from the facility, including those in the application, will not interfere with the attainment or maintenance of any ambient air quality standard." Thus, a facility may submit either air dispersion modeling or other information to satisfy the requirements for obtaining a permit. Procedures for developing appropriate air dispersion modeling are outlined in the Bureau of Air Quality's *Air Quality Modeling Guidelines* as well as the Environmental Protection Agency's (EPA) *Guideline on Air Quality Models* (Appendix W) and other supporting memos and documents available on both the SC Department of Health and Environmental Control (SC DHEC) and EPA modeling web pages. The goal of this document is to provide guidance on the types of information that may be used as other information by facilities to satisfy permit requirements. This guidance does not apply to pollutants triggering Prevention of Significant Deterioration (PSD) permit actions.

Note that the information included here is not intended to be a prescriptive or comprehensive listing of all of the information that would be considered valid other information. Rather, this document is intended to provide general guidance as to the types of information that may be used and should not be construed to exclude other possible types of information that may be submitted and considered by SC DHEC in evaluating a facility's permit application. The Bureau of Air Quality maintains documents that outline different types of exemptions, both from permitting and air dispersion modeling requirements, and this document is not intended to replace/supplant those documents (Note: where applicable, a facility should take advantage of any existing exemptions before relying on other information). Nor is this document intended to describe additional exemptions. Rather, this document is intended to be used as guidance in the types of other information that may be submitted for consideration in satisfying permit requirements for those sources and facilities that are not exempt from air dispersion modeling requirements as outlined in those other documents.

However a facility chooses to address the requirements for obtaining a permit, the permit application must still include the maximum hourly emissions, location (UTM or latitude and longitude coordinates), release height, exit velocity and temperature, and stack diameter for each emission point (or other applicable information on the emissions characteristics needed to accurately describe the source's dispersion characteristics, i.e., area, volume, open pit, and/or flare specifications). In addition, the facility must also include information concerning post minor source baseline emissions increases and decreases (where applicable) so that the Prevention of Significant Deterioration (PSD) modeling inventory can be maintained. Finally, this document does not preclude SC DHEC from requiring that a facility submit air dispersion modeling should a specific situation warrant such a request.

Other Information Options

The following outlines two main options for other information that may be submitted by a facility in a construction or operating permit application. The first includes single factor types of information that, by themselves, satisfy permit requirements. The second includes different weight of evidence types of

information that, taken together with one or more of the other weight of evidence types of information, satisfy permit requirements.

Single Factor Options

The following individual types of information satisfy permit requirements that emissions from the project would not interfere with attainment or maintenance of any state or federal standard. All pollutants emitted must be addressed on a pollutant by pollutant basis in the permit application. One single factor method might only apply for one pollutant while a different single factor (or a weight of evidence approach) might be needed for a different pollutant.

1. Ambient Air Monitoring
   Facility-specific ambient air monitoring data that indicates concentrations of the pollutant being monitored meet applicable standards satisfies permitting review requirements. Such monitoring requires gathering information after start-up of a permitted source in order to satisfy permit requirements. This option requires that the facility submit a monitoring plan to SC DHEC outlining the details of the monitoring activities, including how and why the monitoring location is appropriate, what pollutants are to be monitored, the frequency and duration of the monitoring, and the quality assurance procedures that will be used to insure the validity of the data generated. Department review and approval of the monitoring plan is required to confirm the scope/applicability of the monitoring data in regard to satisfaction of permit requirements.

2. Wind Tunnel Study
   An appropriately designed wind tunnel or other fluid modeling study satisfies permitting review requirements. Any wind tunnel study used requires that the facility submit a plan to SC DHEC outlining the details of the study activities, including a description of the variables involved in the study and how and why these variables are appropriate, what pollutants are to be represented in the study, and the quality assurance procedures that will be used to insure the validity of the data generated. Department review and approval of the study plan is required to confirm the scope and applicability of the study data in regard to satisfaction of permit requirements.

3. Emissions Netting
   A project involving a net facility-wide emissions decrease for a pollutant satisfies permitting review requirements. The netting calculation must be applied on a pollutant by pollutant basis. Facility-wide emission decreases, expressed in tons per year, could be calculated using current allowable to future allowable emissions or the netting methodologies in the PSD regulation.[1]

4. Project only significant impact modeling
   Modeling of the project-only emissions for a particular pollutant (known as significant impact modeling in PSD projects), as opposed to facility-wide modeling, satisfies permitting review requirements. The demonstration must show the project does not exceed the applicable significant impact level(s).[2]

Weight of Evidence Approach

The following types of information may be used as a weight of evidence justification that a particular project will not interfere with the attainment or maintenance of ambient air quality standards. A

[1] SC R 61-62.5 Standard No. 7 Prevention of Significant Deterioration
[2] http://www3.epa.gov/ttn/naaqs/aqmguide/collection/nsr/1990wman.pdf,
http://www2.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf,
http://www3.epa.gov/nsr/documents/20100629no2guidance.pdf,
http://www3.epa.gov/scram001/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf

discussion of the background monitoring concentrations is the starting point of reference in the weight of evidence justifications along with one or more other factors (see list below). As with the single factor approach, all pollutants emitted need to be addressed on a pollutant by pollutant basis in the permit application.

The application must identify the background data that will be used and explain why the data is representative. Considerations for representativeness of the background data used include an analysis of proximity of the background data site to the facility. This analysis also will include a comparison of facility vs. monitoring site land use (including urban/suburban/rural as well as comparative proximity of industrial sources and/or population centers), topography (including a discussion of the presence or absence of significant land features), weather regimes, etc. as appropriate. The justification will include a comparison of the current background design value(s) for a particular pollutant vs. the applicable standard(s). The justification will include a comparison of the project emissions increases vs. the current permitted emissions and/or the emissions inventory of a particular area. Note that the justification requires a pollutant by pollutant analysis as specific details per pollutant may entail that more evidence be supplied for some pollutants than others. For example, where background concentrations are very close to a standard for a particular pollutant, a more in-depth justification is required than where the background concentrations for a pollutant are very low when compared to a standard.

1. Facility-wide or project emissions less than PSD significance thresholds[3]
   Facility-wide or project emissions increases that are less than the PSD significant emissions rate (SER) thresholds are supportive of a conclusion that the facility (or project) will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. The EPA considers emissions below the SER thresholds to be de minimis for purposes of the major NSR (new source review) program. Although EPA screening modeling indicated sources with short stacks could cause measurable increases in ambient concentrations, the EPA did not think that facilities "at the extreme" should drive the NSR program for all sources.[4] With that in mind, this factor likely will be coupled with a discussion of other factors, including favorable dispersion characteristics and background monitoring concentrations.

2. Dispersion characteristics
   A comparison of a new source's dispersion characteristics (release height, exit velocity, exit temperature, discharge orientation, presence or absence of a rain cap, and stack/vent diameter) vs. existing sources provide other information supportive of a conclusion that an increase in emissions from a new (or existing) source will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. Use of the merged stack parameter calculation (see Section 2.2 of the *Air Quality Modeling Guidelines*) serves as an objective tool to perform the comparison between new and existing sources. For example, the merged stack parameter, using an emission rate of 1 (lb/hr or g/s) in the formula for each stack, could be used to calculate the merged stack parameter, M, for stacks being compared. If the merged stack parameter for a new stack (again using an emission rate of "1") has a larger value of "M" than the existing stack (or stacks), then the new stack would be considered to have better dispersion characteristics. In addition, a new stack that will be constructed as a vertical stack without an impediment to vertical velocity and/or at or taller than Good Engineering Practice (GEP) height (thus minimizing the effect of downwash), provides information supportive of a conclusion that a new source would have good dispersion characteristics (either taken on its own or in comparison with existing facility sources). This factor must be coupled with a discussion of other factors including background monitoring concentrations, boundary distance, and/or relative emissions changes of new sources compared to the existing facility/area emissions inventory.

[3] SC R 61-62.5 Standard No. 7 Prevention of Significant Deterioration
[4] Federal Register / Vol. 73, No. 96 / Friday, May 16, 2008

3. Historical modeling results
   A discussion of historical/existing modeling results provides information supportive of a conclusion that an increase in emissions from a new (or existing) source will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. An analysis that includes a discussion of the relative change in emissions for a facility, dispersion characteristics of the source in question, and/or existing background concentrations is particularly helpful when coupled with a discussion of historical modeling results. Also, the calculation used in the toxics deferral procedure outlined in Appendix D of the *Air Quality Modeling Guidelines* serves as a tool to more objectively use existing modeling results to calculate conservative emissions increases that are part of a weight of evidence approach.

4. Level of controls
   A discussion of the level of control applied for a particular source representing very well controlled emissions (such as controls recognized previously as best achievable control technology, or BACT) or the use of a fuel that would minimize emissions for a particular pollutant (such as natural gas or ultra-low sulfur diesel (ULSD) for SO_2) provides information supportive of a conclusion that a project will be constructed/modified in a manner that will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. This factor is one of a number of other factors to be included in the discussion.

5. Actual emissions vs. maximum permitted emissions
   A discussion of the level of actual emissions vs. the existing maximum modeled emissions for a facility provides information supportive of a conclusion that a particular project will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. This type of discussion will include reasons why the proposed project does not significantly change the relationship of the overall facility's actual emissions vs. existing modeled emissions (e.g., if the new project would not de-bottleneck existing operations and the new project would be expected to operate with a similar actual to modeled emissions relationship). Where worst-case emissions are as a result of a little used back-up fuel or start-up and shut-down scenarios, a discussion of the limited number of hours of actual back-up fuel use or start-up and shut-down cycles would support this weight of evidence justification (note that some limit on the use of the back-up fuel may be needed, i.e., back-up fuel used during curtailment only, limited number of start-up and shut-down cycles, etc.). This factor is of a number of other factors, such as existing background concentrations, emissions inventory changes, etc., that will be included in the discussion.

6. Boundary distance vs. existing sources
   A new source located at a significant distance from the closest property boundary and/or at a greater distance than existing sources provides information supportive of a conclusion that a project will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. This factor will be coupled with a discussion of other factors, including background concentrations, favorable dispersion characteristics, and relative emissions changes of new sources compared to the existing facility/area emissions inventory.

7. Emissions inventory
   A discussion of the relative changes in emissions for a project compared to the existing facility emissions, facility county/region inventory, and/or background monitoring station county/region inventory provides information supportive of a conclusion that a project will not interfere with the attainment or maintenance of ambient air quality standards for a particular pollutant. This factor will be useful in a discussion for any pollutant, but would be especially helpful for pollutants that are emitted by a large number of regional sources, like NO_x, where a large county/regional inventory can be justified and compared to a relatively minor increase in emissions for a project.

Note that for $PM_{2.5}$ emissions, the inventory comparison will include changes of SO_2 and NO_x precursor emissions.

8. Project-only/significant impact modeling, Part 2
   If modeling of the project-only emissions (as proposed in the single factor option #4 above) results in predicted concentrations above the applicable SIL, then project-only modeling results can be compared to the ambient air quality standards. In this case, the project-only modeling results are added to current background concentrations along with existing facility modeling results prior to the comparison with the ambient air quality standards. Another approach is combining the project-only results with representative background concentrations. A combined project-only and background concentration total that is below the applicable standard supports the conclusion that the project will not interfere with the attainment or maintenance of ambient air standards for a particular pollutant.