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MEMORANDUM

DATE: May 5, 2020

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FROM: Lou Corio
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SUBJECT: 164532

At the request of KCI Technologies, Inc., POWER Engineers, Incorporated (POWER) reviewed and prepared comments on the ECS Mid-Atlantic, LLC (ECS) report, *Air Quality Analysis, Southfields Parcel I, Elkton, Maryland (ECS Project No. 47:10026)*, April 4, 2020. Our comments are presented below in two primary groupings: 1) comments on the overall general approach and 2) comments on specific aspects of the analysis methodology. The presentation of comments is followed by a set of recommendations for improving the scope and accuracy of the analysis.

Comments

Comments related to the overall general approach are as follows:

1. As discussed in the Executive Summary, Section 1.0 (Background), and Section 2.0 (Statement of Objectives), ECS conducted the Air Quality Analysis (AQA) to estimate the potential ambient air quality impacts from increased motor vehicle emissions due to the proposed project. The focus of the study is truck engine emissions from diesel fuel combustion. As acknowledged in Section 1.2, diesel engine emissions include particulate matter (PM) and gases such as oxides of nitrogen (NO_x), carbon monoxide (CO), and sulfur compounds (such as sulfur dioxide [SO_2]). However, the ECS study focuses only on PM emissions, $PM_{2.5}$ emissions in particular. Although the $PM_{2.5}$ emissions and impacts associated with diesel truck traffic are a well-recognized and important concern, the emissions and impacts associated with the other pollutants of combustion from traffic, including CO, PM_{10}, and nitrogen dioxide (NO_2) (a common form of NO_x in diesel combustion emissions), are also important and should be assessed as part of any such air quality analysis. (For example, 1-hour and annual National Ambient Air Quality Standards [NAAQS] exist for NO_2.) Otherwise, the air quality analysis cannot be considered sufficiently comprehensive.
2. Section 2.0 states that the study format generally follows the guidance of the U.S. EPA publication *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA-420-B-10-040), December 2010 ("EPA hot-spot guidance") for project-level $PM_{2.5}$ hot-spot analysis. However, there are numerous aspects of the AQA that are not conducted in accordance with the EPA guidance. These aspects of the analysis are highlighted in the specific comments below.
3. Because the MOVES2014 model input and output files were not provided with the report, we can't evaluate to what extent that model was applied in accordance with EPA's hot-

spot guidance and confirm that the emission rates were developed consistent with the description provided in the report. The MOVES2014 model output are the critical source of emission factors used to develop the emission rates that are input to AERMOD.

Comments on specific aspects of the analysis methodology:

4. Section 1.3:
    a. Actually, the NAAQS were not established under the requirements of the Clean Air Act Amendments of 1990. The NAAQS for most of the criteria pollutants were established under the Clean Air Act in 1971 (except for lead in 1978, PM_{10} in 1987, and $PM_{2.5}$ in 1997).
    b. It would be informative to note that Cecil County is classified by EPA as being in attainment of the NAAQS for PM_{10} and $PM_{2.5}$, since the focus of this analysis is particulate matter impacts.
    c. Although NO_x is considered a precursor pollutant for ozone formation and is more commonly addressed in regional mobile source impact assessments, the impacts associated with emissions of this pollutant can and should be assessed for smaller, sub-regional scale project assessments, especially given the existence of NAAQS for NO_2.
5. Section 4.1.1:
    a. The acronym DOEE AQD is used in this section but is not explained. We believe that DOEE AQD represents the Department of Energy and Environment Air Quality Division in the District of Columbia. There is no relevance of this regulatory agency to a project in Cecil County, Maryland.
    b. There is no relevance of background CO concentrations given that the focus of the AQA is $PM_{2.5}$ impacts.
    c. The section discusses ambient monitoring data being obtained for the Washington Metropolitan area; however, Cecil County is not part of the Washington Metropolitan area.
6. Section 4.1.2:
    a. The meteorological data are an important data input for pollutant dispersion models, such as AERMOD. ECS states that for the 24-hour impact analysis, a full year of meteorological data were obtained from the National Weather Service for a site in the Mid-Atlantic region. A closer examination of the AERMOD output in Appendix III indicates that the source of meteorological data was Reagan National Airport (DCA). According to EPA's hot-spot guidance, "one of the key factors in producing credible results in a PM hot-spot analysis is the use of meteorological data that is as representative as possible of the project area." The EPA guidance provides further information on the factors that can be used to demonstrate representativeness. ECS provided no explanation or demonstration as to how meteorological data from DCA could be considered representative of meteorology in the Elkton area of northern Maryland.
    b. With regard to the time duration of the meteorological data record used for modeling, the EPA hot-spot guidance states that when using off-site data (i.e., from DCA), five consecutive years of the most recent representative meteorological data should be used. However, as detailed in the report, only one year of meteorological data were used in the analysis.
7. Section 4.1.6:
    a. A map of receptor locations would have been helpful to quickly confirm if receptors were placed at locations relative to the modeled traffic emission sources in accordance with the EPA hot-spot guidance. (The EPA hot-spot guidance

recommends that receptors be placed as close as 5 meters to the emission sources.)

b. The AQA modeling did not use a grid of receptors (with recommended spacing of 10-25 meters) per the EPA hot-spot guidance; only individual discrete receptors (44 total) placed at locations accessible to the public or at properties adjacent to Parcel I and Pulaski Highway were used in the modeling.

8. Section 5.1.3: As noted in Section 1.3 of the report, the EPA has established an annual average NAAQS for $PM_{2.5}$. The AQA did not examine the compliance of project emissions with this standard and did not explain the rationale for not including this assessment.
9. Section 6.0: Based on the limited scope of the air quality analysis presented in the report, the final statement of this section should have read "Based on these findings, ECS concludes that the proposed project does not warrant further analysis of air quality impacts <u>for $PM_{2.5}$ emissions</u>" (underlined text added).

Section 7.0: The DOEE AQD is not the reviewing agency for this project.

Recommendations

To improve the accuracy and scope of the AQA, we recommend the following:

1. Given that the general approach and methodology framework for the analysis is based on the EPA hot-spots guidance, the AQA should more closely follow the steps outlined in that guidance for a quantitative analysis.
    a. The AQA should be revised and expanded to address compliance with the annual $PM_{2.5}$ NAAQS and 24-hour PM_{10} NAAQS, in addition to the 24-hour NAAQS, and should include representative background concentrations for these pollutants and averaging periods.
    b. The selection and processing of surface and upper air meteorological data for modeling should follow the recommendations given in Section 7.5 of the guidance. The rationale for the selection of the particular meteorological monitoring station, in terms of location representativeness, should be discussed in the report. (Meteorological data from DCA should not be considered representative of the meteorology in the Elkton, Maryland area unless an analysis is provided that demonstrates representativeness.)
    c. If meteorological data from an off-site location is selected for the modeling, then a recent dataset of five consecutive years from that station should be used.
    d. The report should also explain: 1) how the surface characteristics (surface roughness length, albedo, and Bowen ratio) used in the modeling are representative of the meteorological monitoring site, and 2) why either the "urban" or "rural" classification was assumed in the modeling.
    e. A network or grid of receptor sites should be used in the modeling per the recommendations given in Section 7.6 of the guidance. Receptors should be placed with finer spacing (e.g., 10-25 meters) close to the emission sources, and with wider spacing (e.g., 50-100 meters) farther from these sources. Also, the closest receptors to a source (e.g., the edge of a traffic lane or a source at a truck terminal) should be no more than five meters from that source. Note that the set of discrete receptor sites used in the original AQA should still be included (along with the receptor grid) in any revised AQA.
    f. If any non-default options are invoked for running AERMOD, an explanation of the reasons for using such options should be provided in the report.

2. For the AQA to be truly considered comprehensive, the AQA should be revised and expanded to evaluate potential impacts from diesel combustion emissions of other criteria air pollutants, including CO and NO_x (as NO_2).
    a. The analysis of CO emissions should follow recommendations given in the EPA publication *Using MOVES2014 in Project-Level Carbon Monoxide Analyses* (EPA-420-B-15-028), March 2015.
    b. The MOVES2014 model should also be used to develop NO_x/NO_2 emission factors, with NO_2 impacts being evaluated using AERMOD and following the guidance in the *Guideline on Air Quality Models* (40 Code of Federal Regulations Part 51, Appendix W), where applicable.
    c. If any non-default options are invoked for running AERMOD for CO and NO_2 emissions, an explanation of the reasons for using such options should be provided in the report.
3. Additional supporting information should be included with the report, in the form of appendices with MOVES2014 model input and output data/files (hard copy or electronic format, as appropriate), to allow for review and confirmation of the application of that model in accordance with EPA guidance.
4. All references to the DOEE AQD and the Washington (D.C.) metropolitan area should be removed from the AQA report.

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