

January 10, 2014
ADEQ Preliminary Comments on BACT Analysis and Modeling Report Sections of
Bowie Power Station Class I Air Permit Application dated September 2013

BACT:

ADEQ finds the analysis and proposed BACT acceptable for all applicable pollutants and emission units with the exception of NO_x for the auxiliary boiler.

Bowie proposed as BACT for the auxiliary boiler NO_x an emission limit of 0.036 lb/MMBtu heat input (HHV), or an exhaust concentration of approximately 30 ppmv @ 3% O₂, using low-NO_x burners. The analysis acknowledges that lower limits are achievable using so-called ultra low-NO_x burners, but proposed that those more effective burners be rejected due to "extreme economic impacts." Specifically, Bowie's permit application (at p. 4-28 and in appendix D) claims the cost effectiveness of ultra low-NO_x burners would be approximately \$117,000 per ton of emission reduction, based on information in the "Final Draft Staff Report for Rules 4306, 4307, and 4320," September 18, 2008, by the San Joaquin Valley Unified Air Pollution Control District.

The data relied upon by Bowie are not applicable to the BACT analysis for the proposed new auxiliary boiler. The cited San Joaquin rulemaking was for a Best Available Retrofit Control Technology rule applicable to existing units; the cited capital cost of approximately \$114,000 represents the cost of replacing existing burners in an existing process heater, not the incremental cost of installing ultra low-NO_x burners in lieu of low-NO_x burners.

Incidentally, the recent PSD permits for Avenal Power in California and Kennecott in Utah include NO_x BACT limits of 9 ppmv @ 3% O₂ for comparable auxiliary boilers. Although this is not indicative of the site-specific economic, energy, or environmental impacts of improved NO_x controls on the proposed auxiliary boiler at the Bowie facility, it is relevant information.

MODELING REPORT:

Model Updates:

New versions of CALPUFF/CALMET and AERMOD have recently been released by EPA. Therefore, the modeling analyses (including the CALMET file creation) need to be updated using these latest model versions. Note that while the results are not expected to change significantly, EPA is certain to negatively comment if the latest regulatory versions of the models are not used.

Secondary PM_{2.5} Analysis:

The PM_{2.5} secondary analysis presents some modeling results from CALPUFF that are used to demonstrate the secondary PM_{2.5} impact locations are located further away from the source than the primary PM_{2.5} impacts, and do not overlay. This is a very good analysis, however information on the maximum (total of primary plus secondary) CALPUFF predicted concentrations should also be presented and discussed to fully evaluate and describe the potential secondary impacts.

Class I Increment:

The analysis of PSD increment consumption at the nearby Class I areas, (Chiricahua Nat'l Monument and Chiricahua Wilderness Area) estimated results less than significant, and hence in accordance with the approved protocol, Bowie did not consult with ADEQ to expand the analysis to more distant Class I

areas. At this time, ADEQ believes the absence of these more distant areas in the analysis is certain to generate negative comments from EPA. Therefore, given that Bowie will rerun CALPUFF using the current version, ADEQ will require receptors be included for all Class I areas within the 300 km CALPUFF domain. In the revised Class I analysis write-up, Bowie should also include information on the CALMET domain, including the map from the 2007 protocol.

In Stack Ratios:

On page E-43 of the modeling report Appendix E, the use of the CAPCOA in-stack NO_2/NO_x ratios is discussed. EPA has previously commented that additional information, from comparable stack testing and/or vendor supplied, would be useful as well as information about ratios in start-up/shut-down vs. normal operation. ADEQ strongly advises Bowie to include additional substantive information to support their selection of ISR(s). It is expected that EPA will comment negatively if the CAPCOA data is the sole source of reference.

Cloud Cover:

On page 5-8 of the application, it is stated that "Cloud cover data from Safford were used in the meteorological data processing rather than on-site solar radiation data." Since the on-site solar radiation data is brought up, it would be useful to expand this to say why it wasn't used – RTP recalls that delta-T measurements were not made (or had some problems), so that the SRDT Bulk Richardson AERMET method could not be used.

Auxiliary Boiler:

The application specifies a limit in hours of operation for the auxiliary boiler at 450 hours/year. Using EPA's intermittent source policy, this emission unit does not necessarily need to be modeled for the 1-hr NO_x and SO_2 analyses, but does need to be included in $\text{PM}_{2.5}$ 24-hr analysis. In the remodeling using the updated version of AERMOD, Bowie has the option to drop the 1-hr NO_x and SO_2 analyses.

EMISSIONS:

The start-up/shut-down turbine flow rates and temperatures are higher than the minimum compliance load flow rates and temperatures, which is unexpected. What is the basis for the turbine SU/SD flows and temperatures?

MISC MINOR COMMENTS:

Any references to ADEQ's Draft Revised Modeling Guidelines (August 2013) should be updated to the final September 23, 2013 version (for example, in the last paragraph of Section 5.4 of the application).

The second paragraph of Section 5.4.2 states "Local and regional emissions from upwind urban areas and rural sources can account for 50%-75% of total observed particulate matter concentrations." This passage generated some discussion amongst ADEQ staff as well as a comment from RTP. The review comments and discussion may be summarized as follows:

- Is this suggesting that 25%-50% are from non-anthropogenic sources ?
- This is a general statement, originally from Particulate Matter Science for Policy Makers: a NARSTO Assessment, and is not specific to the Chiricahua NM data. For clarification it is suggested Bowie preface the statement with *in general*, and include the (NARSTO 2004) citation immediately after the statement.