Alabama Coal Association

October 13, 2010

VIA EMAIL

Mr. Edward Hanlon
Designated Federal Officer
Science Advisory Board
U.S. Environmental Protection Agency
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Re: Comments of the Alabama Coal Association Regarding SAB Mountaintop Mining Panel Draft Report Concerning EPA's Conductivity Benchmark Study

Dear Sir:

The Alabama Coal Association ("ACA") submits these comments regarding the draft report of the Mountaintop Mining Advisory Panel of EPA's Science Advisory Board ("SAB") as described in SAB's Notification of Public Teleconference, 75 Fed. Reg. 56,104 (Sept. 15, 2010). The ACA directs its comments specifically to the Mountaintop Mining Advisory Panel's September 28, 2010, draft report reviewing EPA's study titled *A Field-Based Aquatic Benchmark for Conductivity in Central Appalachian Streams*. The ACA will refer to the Mountaintop Mining Advisory Panel's September 28, 2010, draft report herein as the "Draft Report" and to EPA's draft conductivity benchmark study, which is the subject of the Draft Report, as the "Benchmark Study." ACA notes that it submitted written comments to EPA concerning the Benchmark Study on July 12, 2010, and again on September 3, 2010.

As a threshold matter, the ACA observes that the draft report makes no mention of the data submitted by the ACA to EPA on September 3, 2010. The ACA attached to its September 3, 2010, comment letter a report prepared by Lawrence J. Davenport, Ph.D., and Kevin J. Morse, Ph.D., both of whom are professors of biology at Samford University in Birmingham, Alabama, and experts on aquatic ecosystems in Alabama. The report is titled *An Assessment of Conductivity and Benthic Macroinvertebrate Health and Diversity in Alabama Streams in Ecoregion 68* ("Davenport-Morse 2010"). Among other things, Davenport-Morse 2010 confirms the Draft Report's conclusion that EPA's conductivity benchmark should not be transferred to other geographic regions (like Alabama) where EPA lacks adequate field data. Davenport-Morse 2010 shows that conductivity is not a good indicator of whether Alabama streams have a healthy and diverse assemblage of benthic macroinvertebrates. The ACA requests that SAB carefully review Davenport-Morse 2010, along with ACA's written comments, prior to finalizing the Mountaintop Mining Advisory Panel's report.

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The ACA reiterates that it would be inappropriate to use the Benchmark Study to establish any additional water quality standards for conductivity. Overall, as the Draft Report found, "[t]he [Benchmark Study] is not sufficiently clear, complete or transparent in its justification of the methodology or the chosen benchmark." Moreover, while the ACA does not agree with many aspects of the Draft Report, the SAB's Draft Report exposes many of the inherent weaknesses of the Benchmark Study. While the SAB panel remains supportive of the Benchmark Study, the ACA believes the weaknesses of the Benchmark Study identified by the SAB panel render the Study unreliable and insufficient as a basis for establishing any NPDES water quality standard, or benchmark, for conductivity.

The ACA provides the following specific comments on the Draft Report, by charge question, below.

> *Charge Question 1: The data sets used to derive a conductivity benchmark were developed primarily by two central Appalachian states (WV and KY). Please comment on the adequacy of these data and their use in developing a conductivity benchmark.*

The SAB raised concerns that only macroinvertebrate genera (specifically insects) were used and did not account for other animal groups such as fishes, mussels and even mammals. Another concern raised by the SAB is that data from the entire state of WV was used in determining the benchmark and may bias the calculations, since some areas of the state do not contain coal or coal mining activities. The ACA shares these criticisms raised by the SAB and believes that the data sets used by EPA were inadequate to develop a conductivity benchmark.

> *Charge Question 2: The derivation of a benchmark value for conductivity was adapted from EPA's methods for deriving water quality criteria. The water quality criteria methodology relies on a lab-based procedure, whereas this report uses a field-based approach. Has the report adapted the water quality criteria methodology to derive a water quality advisory for conductivity using field data in a way that is clear, transparent and reasonable?*

While the SAB generally agreed that the use of a field-based approach was justified under the circumstances, the SAB recommended that "the report needs to be more explicit, and/or complete, in justifying the use of conductivity as an indicator rather than particular ions or ion ratios." We agree with this criticism. In the Benchmark Study, conductivity is being used as an aquatic life benchmark that is derived from an existing macroinvertebrate data set with limited water quality measurements. Because there are no flow measurements associated with the sampling locations, the SAB was right to question the percentage of data that came from perennial, intermittent, or ephemeral streams. For these reasons, the ACA believes the Benchmark Study failed to adapt the water quality criteria methodology to

derive a water quality advisory for conductivity using field data in a way that is clear, transparent and reasonable.

> *Charge Question 3: Appendix A of the EPA report describes the process used to establish a causal relationship between the extirpation of invertebrate genera and levels of conductivity. Has the report effectively made the case for a causal relationship between species extirpation and high levels of conductivity due to surface coal mining activities?*

While the general consensus of the SAB was that a convincing case was made, the SAB emphasized that conductivity itself is not a pollutant. Instead, it is a surrogate measure for the constituent ions in the aqueous mixture. According to the SAB, "the EPA document should include more information on the likely mechanisms of extirpation produced by the constituent ions because stress is not due to conductivity itself, but rather is linked to volume regulation, ion regulation and osmoregulation." We agree. It is the opinion of the ACA that, because the specific ion constituents contributing to conductivity were not measured during the EPA's macroinvertebrate surveys, conductivity itself cannot be used as an aquatic life benchmark. The ACA believes that the Benchmark Study fails to make the case for a causal relationship between species extirpation and high levels of conductivity due to surface coal mining activities.

> *Charge Question 4: In using field data, other variables and factors have to be accounted for in determining causal relationships. Appendix B of the EPA report describes the techniques for dealing with confounding factors. Does the report effectively consider other factors that may confound the relationship between conductivity and extirpation of invertebrates? If not, how can the analysis be improved?*

We believe that the SAB makes its strongest critique of the Benchmark Study in this entire report regarding EPA's questionable decision to use a coarse water quality measurement like conductivity as an aquatic life benchmark. In the SAB's words:

> The Panel emphasizes the importance of clarifying the relationship between conductivity and the matrix ions that generate conductivity. The document as a whole has not provided sufficient clarity regarding the relative importance of conductivity (i.e., the effect of salinity/ionic strength on an organism's ionic balance) versus specific ionic constituents as causal variables. This contributes to the lack of clarity in whether sulfate, total ionic strength, or some other single or combination of chemicals is the most appropriate causal factor. Species sensitivity distributions should be presented for each of the ions (e.g., sulfate and bicarbonate) thought to play a potentially important mechanistic role in the extirpation of macroinvertebrate species.

The ACA aggress with these criticisms. The SAB panel also offered additional potential confounding factors for EPA to consider such as selenium, other trace metals, dissolved organic carbon, flow, substrate composition, and vegetation. The ACA agrees with the SAB that such additional factors must be considered. For these reasons, the ACA believes that the Benchmark Study failed to effectively address factors that may confound the relationship between conductivity and extirpation.

> *Charge Question 5: Uncertainty values were analyzed using a boot-strapped statistical approach. Does the SAB agree with the approach used to evaluate uncertainty in the benchmark value? If not, how can the uncertainty analysis be improved?*

The SAB stated that this approach appears sound, but offered suggestions for clarifying some aspects and improving others. In addition to requesting that EPA provide a more detailed description of the method used, the SAB expressed concern that uncertainties in the assignment of cause and effect between specific conductance and macroinvertebrate extirpation are not reflected in the confidence limits. The ACA shares these concerns raised by the SAB and believes that the Benchmark Study fails to evaluate adequately uncertainty in the benchmark value.

> *Charge Question 6: The field-based method results in a benchmark value that the report authors believe is comparable to a chronic endpoint. Does the Panel agree that the benchmark derived using this method provides for a degree of protection comparable to the chronic endpoint of conventional ambient water quality criteria?*

The major concern raised by the SAB was that EPA used genera extirpation as an effects endpoint. The SAB suggested that EPA consider incorporating a safety factor into the endpoint. Another SAB concern was that "focusing on one sensitive group of invertebrates (Ephemeroptera) might limit the persuasiveness of the benchmark in risk management, and thereby make it less defensible." The ACA does not believe that the EPA approach is as good as laboratory-based chronic toxicity testing. However, we share the SAB's concerns about using one sensitive group of organisms to establish a benchmark for all. For this reason, the ACA believes that the Benchmark Study does not provide a benchmark consistent with conventional ambient water quality criteria.

> *Charge Question 7: As described, the conductivity benchmark is derived using central Appalachian field data and has been validated within Ecoregions 68, 69, and 70. Under what conditions does the SAB believe this method would be transferable to developing a conductivity benchmark for other regions of the United States whose streams have a different ionic signature?*

The SAB Panel expressed its opinion that the field method used to develop the conductivity benchmark was general and flexible enough to allow the approach—but

not the calculated benchmark value—to be used in other ecoregions. In general, the SAB recommended that benchmark values should be based on large data sets available from within each region and that the application of the current benchmark value beyond the geographic bounds of the data set (WV and KY) would be difficult to defend for a variety of reasons. The ACA agrees that a benchmark value established for one ecoregion cannot be legitimately transferred to another. For example, Alabama's geology, climate, and macroinvertebrate assemblages differ from those in West Virginia and Kentucky such that legitimate comparisons cannot be made between these states.

> *Charge Question 8: The amount and quality of field data available from the states and the federal government have substantially increased throughout the years. In addition, the computing power available to analysts continues to increase. Given these enhancements in data availability and quality and computing power, does the Panel feel it feasible and advisable to apply this field-based method to other pollutants? What issues should be considered when applying the method to other pollutants?*

In general, the SAB Panel expressed its opinion that this methodology can be translated to other environmental stressors with a few caveats—such as geology, how the stressor influences taxa, quantity and quality of data, and potential use of tiered aquatic life uses. The ACA believes that field-based methods are generally not as reliable as laboratory-based testing. However, where field-based methods are employed they must account for all potential stressors. It is the opinion of the ACA that the Benchmark Study failed to do so.

In conclusion, the ACA would like to reassert the comments it shared with EPA previously concerning the EPA's Benchmark Study. The ACA believes that many of those criticisms have not been addressed by EPA or the SAB. Furthermore, as detailed above, the ACA believes the SAB has identified many weaknesses of the Benchmark Study with which the ACA agrees. While the SAB remains supportive of the Benchmark Study, the ACA believes the shortcomings of the Study identified by the SAB panel render it unreliable and insufficient to establish any NPDES water quality standard or enforceable benchmark. The ACA has also reviewed, and joins, the separate comments filed by the National Mining Association ("NMA"). The NMA points out many of the continuing weaknesses of the Benchmark Study and other specific areas of concern that have not been addressed by the SAB.

ACA appreciates this opportunity to provide these comments to EPA. Thank you for the opportunity to provide these comments and for your consideration.

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Best regards,

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