

Virginia City Hybrid Energy Center
Response to Data Request
Bruce Buckheit, Member, Virginia Air Pollution Control Board

Question (Page No. 8):

Similarly, the record is fairly complete as to impacts on the environment generally associated with emissions of the pollutants at issue here. You may wish to simply incorporate parts of the comments into the BACT analysis by reference, but I would ask for a short (2 page) summary addressing acid rain issues in this region. Acid Rain impacts were first identified in the northeast, largely because the soils in that area had little buffering capacity. Many may assume that the problem is either limited to or concentrated in the northeast. It is reported that the combined effects of the Acid rain and CAIR programs are showing measurable improvement in that region. However, it is now recognized that that the Southern Appalachian region, with its greater buffering capacity, has absorbed so much acid deposition that absent significant SO₂ reductions beyond the Acid Rain and CAIR programs, measurable progress may not be achievable for decades. As of a year ago TVA's website reported that agency's assessment that remediation of the resource was impossible. According to TVA, the best approach would be to try to limit any further damage rather than make efforts to recover the resource.

NAPAP has issued a comprehensive report on this matter,

<http://ny.cf.er.usgs.gov/napap/Information/NAPAP%20Report%208-22-05.pdf>.

To the extent that DEQ has conducted an assessment of this issue, it may be sufficient to reference that effort.

Response:

Acidification of streams and lakes was an ongoing concern in much of the United States, and was of special concern in the eastern United States including the mid-Atlantic area. Title IV of the 1990 Clean Air Act (CAA) was designed to address emissions that contribute to acidification by forcing reductions in emissions of oxides of sulfur (SO_x) and oxides of nitrogen (NO_x) from electric generating units (EGUs). Since the 1990 CAA programs have been implemented to address acid deposition, significant reductions of sulfate and, to a somewhat lesser degree, nitrate deposition has occurred.

The *National Acid Precipitation Assessment Program Report to Congress: An Integrated Assessment*, issued in 2005 characterizes the impact of the federal Title IV program on acid deposition. In general, the Title IV programs have successfully reduced SO₂ emissions by 35% and NO_x emissions by 33% from 1990 levels nationally. At the same time, the report indicates that average annual atmospheric concentrations of SO₂ in the Northeast were 40% lower in 2000-2002 than in 1989-1990 and concentrations in the mid-Atlantic were 30% lower in 2000-2002 than in 1989-1990. A comparison of sulfate deposition during those two intervals shows a decrease in annual sulfate deposition in the Northeast of 40% and in the mid-Atlantic of 35%. Wet nitrate deposition does not show

similar trends, possibly because reductions of NO_x emissions from power plants have been more moderate during that time and, perhaps more significantly, because more than 50% of NO_x emissions are the result of non-EGU emission, i.e., automobiles and non-road vehicles.

In addition to the SO_x and NO_x emission reductions achieved by the federal Title IV program, significant continuing emission reductions are anticipated by the Clean Air Interstate Rule (CAIR) and new EPA regulatory requirements affecting on-road and off-road engines and diesel fuels. Also, as the bank of Phase I acid rain allowances is exhausted, total EGU SO_x emissions will actually reach the level of the national cap of 8.95 million tons and all existing and new affected units will jointly operate at or below this level of emissions.

The proposed Dominion Virginia City Hybrid Energy Center (VCHEC) will utilize circulating fluidized bed (CFB) combustors which burn a wide variety of fuels available in the region. The CFBs will employ best available control technology (BACT) to reduce emissions from CFB combustors. The units are designed to operate at or below a SO₂ emission limitation of 0.12 pounds per million Btu's (3 hour average) and at or below a NO_x emission limitation of 0.07 pounds per million Btu's.

The construction of the VCHEC will result in the generation of approximately 585 MW of power currently imported into Virginia from neighboring areas within the PJM. This imported power, generated in Tennessee and other PJM states is generated by coal combustion that emits SO₂ at much higher rates. For example, the three TVA facilities in eastern Tennessee emit approximately 1.03¹ to 1.24¹ pounds of SO₂ per million Btu's and 0.22¹ to 0.39¹ pounds of NO_x per million Btu's. These rates are an order of magnitude greater than the emissions that will result from the generation at the proposed facility. In other words, the new facility will result in cleaner generation of power needed in Virginia and, by reducing the need for power generated by higher emitting facilities in upwind states, will reduce acid deposition impacts on Virginia.

In addition, Dominion has announced that it is developing plans to convert the company's Bremono Bluff Power Station, 234 megawatts gross (Units 3 &4) from coal to natural gas firing after the construction of the Virginia City coal fired facility. This conversion would result in a SO₂ emission reduction from the generating station in excess of 10,000 tons per year which far exceeds the SO_x permit limits of the VCHEC and significant NO_x emission reductions while maintaining the same electricity generation levels. Though the Bremono Bluff units are downwind of most of the reviewed Class I areas, these reductions would have some positive impact on Class I areas in Virginia not to mention areas to the northeast. It should be noted that SO₂ is also involved in the formation of PM_{2.5}. Reducing SO₂ at Bremono Bluff should help downwind areas such as Northern Virginia with its PM non attainment status.

¹ Based on annual CY 2006 CEMS data for TVA's Bull Run, John Sevier and Kingston plants as reported in EPA's Clean Air Markets – Data and Maps

In summary, the construction and operation of the VCHEC may have a net positive impact on the acid rain deposition levels in the Southern Appalachian areas. The net reduction of SO_x and Hg levels from the Bremono Bluff conversion would insure that a net environmental atmospheric benefit is achieved.