

AGENDA ITEM 10

ECONOMIC ANALYSIS OF HYDROGEN SULFIDE ACCEPTABLE AMBIENT LEVEL AMENDMENT

Summary

The proposed rules would amend toxic air pollutant procedures 2Q .0700 and a section on Control of Toxic Air Pollutants, 15A NCAC 2D .1100 and these modifications incorporate recommendations of the Scientific Advisory Board of the North Carolina Department of Environment and Natural Resources.

The economic assessment will only consider the annual impact during the first five years, beginning the period of analysis when the proposed rules may become effective on July 1, 2004. The acceptable ambient level (AAL) concentration for Hydrogen Sulfide is currently set at 2100 micrograms per cubic meter based on one-hour averaging period. Some facilities may have control requirements due to recent discovery that an emission source had been neglected in modeling procedures for NC air toxic program compliance demonstrations. It is assumed that about 10% of total estimated rule impact control costs would result to meet the existing requirements based on relative emission reductions. For this analysis, a baseline industry aggregate annualized cost of 4 million dollars, 22% of this total is annual capital recovery while the remainder is annual operation, maintenance and replacement. This baseline estimate is needed because 'changes from the baseline' are the measure of rule impact reported in this analysis.

In an effort to provide more refined cost estimates associated with air toxics rulemaking, DAQ embarked upon a modified approach to estimate costs associated with this rulemaking. In some previous assessments the agency has used a template representing the various actions, which a facility might need to take to demonstrate compliance with the program in conjunction with some general cost estimates for each of those actions, emissions inventory data and historical information on modeling demonstrations to estimate costs. The actions a facility might take range from emission calculation and comparison to toxics permitting rates to screen or refined dispersion modeling and on to installation of controls. The rule does not mandate specific controls in order to provide flexibility to the facilities to choose the compliance method they find most operationally and economically effective. As a result the template approach provided a generalized cost estimate.

In this instance DAQ engaged industry early in the process regarding costs to comply with possible levels for a revised AAL. For the purposes of the assessment DAQ focused on those affected industries with the largest emissions contribution, the Pulp and Paper industry and the Phosphoric Acid manufacturing industry. To date industry has been able to provide aggregate cost data based on affected member facilities' anticipated approaches necessary to achieve compliance at the SAB recommended level of 56 ug/m³ for a one-hour averaging time. The bulk of cost is associated with control of wastewater processes for the Pulp and Paper industry sector.

At the request of the Division of Air Quality (DAQ), MCIC has compiled aggregate cost estimates for control of hydrogen sulfide emissions from six (6) sites operated by four (4) MCIC member companies: Blue Ridge Paper Products, International Paper, PCS Phosphate, and Weyerhaeuser. DAQ specifically requested that MCIC identify the cost differential for two (2) emission control scenarios: (1) control of all hydrogen sulfide emissions, including emissions from wastewater collection and treatment facilities; and (2) control of all hydrogen sulfide emissions except those from wastewater collection and treatment facilities.

The estimated capital costs for control of all hydrogen sulfide emissions at each of the six (6) plant sites is \$360 million, and the estimated capital costs for control of all hydrogen sulfide emissions except for those generated by the wastewater collection and treatment facilities is \$18.5 million. Thus the aggregate cost differential for emission controls from all sources versus control from all sources except the wastewater collection and treatment systems is \$341.5 million.

It is important to note that each of the plant sites are unique and that the capital costs for emission

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controls necessary to comply with the proposed AAL for hydrogen sulfide under either of the two emission control scenarios vary widely among the six (6) sites. It is also important to note that there are significant costs which are not included in these capital cost estimates, such as the potentially major cost of de-commissioning and demolition of existing wastewater treatment systems (very large lagoons are currently in operation at four (4) of the six (6) sites), site preparation for new capital construction, production down-time during construction, etc.

For the alternative AALs being considered, capital costs have been broken out according to annual capital recovery and operation, maintenance and replacement. The cost ratios are based on details provided by a few representative facilities, which were then applied to the aggregate capital investment total.

Hydrogen Sulfide	Baseline	Proposed Alternative AALs		
Averaging Period	1-hr	1-hr	24-hr	24-hr
Micrograms per cubic meter	2100	56	83	33
<u>Affected Industry Aggregate</u>	- - - - - (million dollars) - - - - -			
Total Capital Installation Cost*	34	360	360	360
Annual Capital Recovery	1	10	10	10
Annual OM&R	<u>3</u>	<u>35</u>	<u>35</u>	<u>35</u>
Total Annualized Cost	4	47	47	47
Rule Impact		42	42	42

*MCIC, Aggregate Cost Differential for H2S Date: Fri, 24 Jan 2003

Limitations and uncertainty of analysis

The assumptions related to regulatory alternatives are quite uncertain due to external actions that are occurring among affected source groups. The future air toxic emissions and resulting ambient concentrations will be affected by emerging control technology. Over the five-year period of analysis, the uncertainty of cost components, with respect to compliance, are impossible to predict. There are many possible problems, along with alternative solutions, that provide different incentives to achieve the acceptable level of ambient concentrations.

A recent study of compliance demonstration performed by the state modeling staff revealed that 76% required permit restrictions. These restrictions included permit limits on emissions (47%), operating hours (38%), and/or limit on fuel usage (21%), in various combinations. Additional permit restrictions involve physical modification at the facility and include controls (43%), stack modifications (11%), source relocation (2%), source design (6%) and/or reformulation (4%).

New information may influence the economic realities associated with this rule or any policy, but the flexibility in this regulatory approach should allow market forces to drive the environmental solution that is more cost effective. A rule option exists for a facility to seek approval of a variance for maximum feasible control technology, which could provide regulatory relief in cases of technical feasibility or economic hardship. In lieu of specific marginal control costs for each alternative, the costs for methods of compliance control were assumed to remain constant for all proposed levels. Other conclusions about the changes in regulated behavior are equally uncertain, and are related to summarizing the information to allow economic data from other sources to be properly matched to staff cost estimates and emission sources.

Conclusion

The aggregate economic impact estimates were generated using engineering and modeling

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considerations, and queries of DAQ emission inventory data sets to develop cost analyses and which then serve as inputs to the economic analyses. This economic analysis provided guidance to and coordinated with the engineering staff and industry representatives to develop cost estimates. MCIC did not provide aggregate cost estimates for each AAL, because the order of magnitude nature of the basic uncertainty associated with these costs. The threshold determination of annual costs in excess of 5 million dollars, in any year, is conclusive as the total cost estimate exceeds 42 million dollars. The proposed rule change is not expected to cause a state or local fiscal impact. Based on the available cost estimates, the proposed amendment is considered a significant rulemaking. Either of the proposed alternative would be filed as resulting in 'substantial economic impact' which in turn requires detailed explanation of the analysis methodology and requires an additional 30 days for the comment period associated with the public input process.

There also appear to be significant public health benefit from the various proposed AALs in terms of reduced ambient concentrations and resulting health costs related to hydrogen sulfide exposure. Those health benefits will be included in the full analysis to be filed with OSBM.