92-87.02

Multistate Ozone Control Strategy Development in the Lake Michigan Region

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INTRODUCTION

The Lake Michigan Ozone Study (LMOS) was a regional effort undertaken by the States of Illinois, Indiana, Michigan, and Wisconsin, as well as the United States Environmental Protection Agency (EPA), to develop a photochemical model which would predict the formation and transport of ozone and its precursors within and through the Lower Lake Michigan Air Quality Region under a variety of meteorological conditions. Because of the understanding gained during this study as to the regional nature of the ozone problem, and because of the success of the cooperative effort expended by all parties, a decision was made to attempt to develop a regional control strategy which would be reached by a consensus of the parties involved. This paper describes the organizational and procedural issues involved, as well as some of the technical issues surrounding the selection of potential mitigating measures for modeling. Finally, some thoughts on the prospects for success and continued cooperation based on photochemical modeling will be offered.

BACKGROUND

Multistate activity on the problem of ozone in the midwest began in 1987, when the State of Wisconsin brought suit against the U.S. EPA over the federal agency's alleged failure to force State Implementation Plan (SIP) revisions in northeastern Illinois and northwestern Indiana.[1] Wisconsin contended that ozone and its precursors were being transported from the Chicago-Gary area, rather than originating in Wisconsin, and that it was this transport, rather than locally originating emissions, that was causing their exceedances.

After several suits and countersuits, the case was settled out of court in 1989.[2] A fundamental part of the settlement agreement was a commitment by each party - Wisconsin, Illinois, and the U.S. EPA - to conduct a three-year study which would result in the development of a photochemical model for use in preparing a control strategy for the lower Lake Michigan airshed. An agreement for this study was negotiated, and was joined by the States of Indiana and Michigan as well. This agreement not only outlined a major research effort but also established specific milestones and funding commitments for the project. To manage the study, administer the funds, and act as the contracting agency, a non-profit corporation was formed, the Lake Michigan Air Directors Consortium.

ORGANIZATIONAL ISSUES

In the fall of 1990, the Clean Air Act Amendments were passed and signed into law. Among its other elements, the Act established deadlines and compliance requirements for ozone

National Ambient Air Quality Standard attainment. To meet those deadlines, states which contained non-attainment areas would have to begin planning and preparing control strategies very quickly. For this reason, the Lake Michigan Air Directors Consortium began an investigation of alternative models for interstate cooperation on the development of a regional control strategy. Among the possibilities considered were: a formal ozone transport commission, as described and provided for in the Clean Air Act Amendments[3]; a continuation and expansion of the LMOS agreement; a new agreement among the four states; bilateral agreements between states; and independent action on the part of each state. Each of these options had both positive and negative characteristics or ramifications, all of which were systematically reviewed and discussed. In particular, information was sought from the Northeast Ozone Transport Commission, established by the Clean Air Act Amendments, as to their procedures, experience, and working relationships.

After several months of discussion and negotiation, the options had been narrowed down to two: a formal ozone transport commission and a new agreement among the four states. (Because of the restrictions on the funding appropriations for the LMOS, amending the existing agreement was considered politically too difficult to attempt.) While the states acknowledged that an Ozone Transport Commission would have legal standing and would eliminate the need to submit four separate SIPs, the flexibility and the lack of initial conditions or required actions made the other option more appealing. A new agreement, specifically dealing with the development of control strategies, was drawn up and submitted to each Governor for his signature.[4]

This new Memorandum of Agreement (MOA), after a brief introduction and statement of intent, established a management structure for the effort, consisting of three levels: a Policy Steering Committee (PSC), comprised of the Governor or the Environmental Director of each state, which would meet once every three months to review progress and make policy decisions; a Technical Steering Committee (TSC), made up of the Directors of the Air Quality offices of each state, to oversee the day-to-day efforts; and a Project Team, including Air Quality staff, State Department of Transportation staff, and any others deemed appropriate by the member states. Their work would be supported by the Consortium and by private contractors as necessary. Although the U.S. EPA was invited to participate, the federal agency chose not to join formally in the effort, since it would be responsible for ruling on the suitability of the control strategies which the group developed. The U.S. EPA does participate in an advisory capacity at all levels, however.

Another important element of the MOA was a project schedule, which all of the signatories committed to meeting. Because of the federally-imposed deadline of November, 1994, for SIP submittal,

and because each state felt that internal review, legislative action, public hearings, and other political processes would require about a year, a delivery date of November, 1993, was established for a regional control strategy. Since the photochemical model would not be delivered to the states until March, 1993, and since the number of alternatives that could be modeled would be limited by the simulation time and the availability of equipment, there was a recognition that a prescreening process for potential control strategies would have to be established, and that this would require a protocol or objective guidelines. Further, the members felt that, in order to meet the deadlines, the control strategies to be modeled should be identified and selected by the time of model delivery. Thus the following milestones were written into the MOA:

1. PSC formed and first meeting held by March 1, 1992.
2. Agreement achieved on baseline emissions inventory and on selection procedures for control strategies by September 1, 1992.
3. Agreement achieved on preliminary strategies for modeling/simulation by March 1, 1993.
4. Consensus agreement on strategies for attainment by November 1, 1993.

Other elements of the MOA include funding responsibilities, amendments, the time within which the agreement will remain in effect, and procedures for withdrawal by individual states.

PROCEDURAL ISSUES

As of January 31, 1992, the Governors of Illinois, Indiana, and Wisconsin had signed the MOA, and the Governor of Michigan had committed to doing so. In anticipation of full participation, the first organizational meeting of the PSC was held on January 30, a full month ahead of schedule. At this meeting, a set of bylaws and procedures were adopted, officers were selected, and the Committee stated its expectations for the following three months: a draft detailed work plan, a draft protocol for selecting control strategies, and exploration of several funding options for the strategy development effort. The work plan was to be completed in March, the protocol in April. The Committee decided to meet next in early May.

The TSC first met under the aegis of the MOA on February 28, 1992. At this meeting they discussed the first draft of the work plan, which had been prepared by Consortium staff and reviewed by the Project Team; some issues related to the development of the protocol for selecting control strategies to be modeled; the deadline for completion of the baseline emissions inventory, which would be the basis for control strategy development; and plans for regional enhanced ozone monitoring. In accordance with a policy of broad public participation in the control strategy development process, the TSC also heard presentations by, and had

a dialogue with, industry representatives, on topics such as implementation schedules, new technologies, and economic concerns.

TECHNICAL ISSUES

While the development of a work plan did not pose any significant technical problems, it quickly became apparent that a protocol which satisfied both the technical requirements of the task and the political needs of the participants would be very difficult. Indeed, prior to addressing the technical issues, certain fundamental decisions had to be made. For example, the question of whether reductions should be sought where the gains were easiest to achieve, or whether reductions should be sought based on percentages of source categories, had to be answered before any work could begin. These philosophical or policy decisions were the subject of much debate at the highest levels of this effort.

In dealing with the technical requirements of the protocol, the approach was to establish a review of the emissions inventory, by source category, using a system based on Standard Industrial Classification codes, County Business Patterns, and other resources. Anticipating political and even legal questions meant that there had to be strong evidence that all reasonable alternative control strategies were considered. The process by which alternative strategies were assessed had to demonstrate a sensitivity to economic and social considerations, the relative state of control technology already in place in each industry, the gains which could be achieved in each industry, and fairness in assessing the relative impacts on each state. While much progress has been made, it is not surprising that this document is still being written.

In terms of the actual modeling of potential control strategies, the Consortium expects that a certain amount of preliminary assessments will have been made prior to the actual delivery of the model. For example, some of the sensitivity runs will assess certain alternatives, merely to determine the model's accuracy in replicating actual observed conditions. Also, the effects of the control strategies mandated by the Clean Air Act Amendments will have been built into the emissions modeling system, and the results of these efforts will be seen. The major technical shortcoming, as far as can be seen, is the long run time required to simulate an ozone episode. Each three-day episode requires approximately six days of simulation time, plus set-up and post-run analysis time. Thus each control strategy to be modeled will require more than a week. Because of the very short time frame between the delivery of the model and the deadline for achieving consensus on the regional control strategy, as well as the limited resources available to the states, only a limited number of runs are possible. The

Consortium is currently investigating model design changes, the purchase of additional equipment, and other measures which would increase capacity.

PROSPECTS FOR CONTINUED SUCCESS

While the interstate cooperative effort has been remarkably smooth thus far, much of the lack of conflict can be attributed to the good working relationships and procedures developed during the LMOS, which had a very low potential for conflict. The small number of participants and the relatively small area under consideration has also helped. Finally, the role of the Consortium as an independent player and consensus builder has been important. It must be understood, however, that this process will require the group to confront some politically difficult issues, such as culpability and the unequal distribution of responsibility for mitigation. As the more difficult issues are addressed, there will be conflict which will put strains on this working relationship. One of the important elements of the bylaws of the PSC is that all policy decisions will be made by consensus. While voting procedures for routine decisions have been established, there is no provision for tie-breaking. Part of the appeal of the negotiated agreement model was that the commitment of each state to the process, while meaningful, is not absolute, as it would have been to a transport commission. Withdrawal from the agreement is possible. While the threat of withdrawal has never been posed, it is a theoretical "bargaining chip" in the equation, and gives any one state a greater influence on matters of greater perceived impotance - a counter to the "tyranny of the majority." While all participants understand that such a threat could be posed, it is important to note that all decisions thus far have been made by negotiation to consensus, and that there has never been a vote on any issue. It is this commitment to consensus, coupled with the positive experiences of the past two years, which will make this effort successful.

For more information on the Lake Michigan Ozone Study, the Lake Michigan Ozone Control Program, or the Lake Michigan Air Directors Consortium, please contact:

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REFERENCES

1. Wisconsin v. Reilly, U.S. Dist. Ct. E.D. Wisc., Case No. 87-C-0395.

2. Settlement Agreement, U.S. Dist. Ct. E.D. Wisc., Case No. 87-C-0395, September, 1989.

3. Public Law 101-549, Title I, Section 176A.

4. Memorandum of Agreement for Development of Interstate Ozone Control Strategies.