

ILLINOIS POLLUTION CONTROL BOARD  
September 29 , 1975

IN THE MATTER OF )  
 )  
PROPOSED OXIDANT EPISODE ) R75-4  
 )  
REGULATION AMENLMENTS )

INTERIM OPINION OF THE BOARD (by Mr. Goodman):

On August 14, 1975, the proposed oxidant episode regulation amendments were remanded by the Board to the Illinois Environmental Protection Agency (Agency) for further study with respect to testimony and comment from the hearings held and any subsequent information received by the Agency. In addition, the Agency was ordered to resubmit the amendments by November 15, 1975.

It is the intention of the Board in this Opinion to elaborate on the reasons for the Order remanding the proposed amendments and to comment upon the response of the various persons affected as shown by testimony and exhibits presented and public comments submitted pursuant to the hearings held in this matter.

The purpose for remanding the proposed amendments revolves around three conclusions determined by the Board: 1) It appears that the proposed regulations cannot be promulgated in time to reasonably affect the 1975 oxidant season due to the regulatory time constraints. Indeed, the very earliest date upon which the regulation could be effective would be about the second week in September, 1975, which would have a very minimal effect upon oxidant episodes in 1975. 2) There was no evidence introduced at the hearings which would indicate that the existing regulations are not protecting the citizens of the State of Illinois in a reasonable manner at this time. 3) The data available from the 1975 oxidant season will be more than twice that previously available due to the increase in number of monitors available to the Agency. As it appeared from the evidence presented at the hearings that the data base for these proposed regulatory amendments was somewhat limited, it would seem prudent to assess the additional data gained during the 1975 episode season before determining whether new regulations should be promulgated.

It is the intention of the Board that the Agency review and revise the proposed regulations in light of both the evidence and testimony introduced at the R75-4 hearings and the additional monitoring data supplied by the 1975 oxidant

season. The November 15, 1975, date for resubmission of the proposal was chosen in order to allow sufficient time to consider and promulgate the regulations and establish any strategy plans that might be needed for the 1976 oxidant season.

### Considerations

A major change proposed by the amendments concerns the flexibility allowed the Agency with respect to the determination of atmospheric conditions, Rule 402(c), (R.76). Dr. R.A. Wadden, University of Illinois Medical Center, expressed his concern with this flexibility indicating that the National Weather Service forecasts, coming from a third party, should be retained. The Board feels that the flexibility proposed by the amendments, with respect to ozone levels, is reasonable, that the Agency's techniques for predicting ozone levels are at least as good as those of the National Weather Service, and that the Agency is closer to the problem (R.191).

The testimony of Richard Kates and others indicated misunderstanding with respect to the ability of other agencies to develop their own limits and strategies. It is the Board's opinion that the amendments, as they are now constituted, do promote misunderstanding in this area and that they should be re-evaluated to make the Agency's position on alternate limits and strategies clear (R.198).

Although a considerable amount of doubt was cast upon the basis for the selection of a precise number corresponding to the Emergency Level for ozone at 0.5 ppm, the Board feels that the 0.5 ppm level is reasonable in the face of two important factors: 1) The United States Environmental Protection Agency has proposed 0.5 ppm as the recommended level for ozone concentrations at the Emergency Level. The weight of this evidence is based both upon the expertise of the USEPA, and the need for some sort of common target level between the states with respect to action plans in an emergency situation. 2) It is generally accepted that a level of 0.6 ppm of ozone will severely affect most persons, i.e., 0.6 ppm of ozone would be expected to cause significant harm. Since the level of 0.6 ppm of ozone is expected to cause significant harm, it is prudent to put the fullest measure of abatement into effect prior to that level. The precise level at which this maximum effort should be expended is not apparent from the record. Since there is no precise level, it would appear reasonable to accept USEPA's proposed level of 0.5 ppm of ozone as the Emergency Level. Should further information become available concerning this Emergency Level prior to the Board's consideration of the proposed amendments, such information should of course be brought before the Board immediately (R.760).

Concerning aircraft flights in the Cook County area, the Board feels that, unless the hydrocarbon emission reduction is expected to be significantly higher than the 0.5% estimated at the present time, forbidding all aircraft flight departures is not a reasonable strategy for a Red Alert. If the total reduction amounts to only 0.5%, it would appear prudent to put this strategy into the Emergency Level. A showing that such a strategy would reduce the hydrocarbon levels in Cook County to a significantly lower level would justify the strategy at the Red Alert Stage (R.581).

The major question addressed by the proposed amendments is the effect of ozone on the health of the population and at what level certain strategies should be implemented with the object of reducing this ozone concentration. Ozone has been determined to be a serious pollutant, indeed Dr. Bertram W. Carnow (Director of the Environmental Health Resource Center of IEQ and Medical Director of the Chicago Lung Association), states that "ozone is certainly the most serious of all pollutants" (R.106). Ozone affects the human mucus linings and lung tissue, causes chromosomal breaks, is an ocular irritant and causes red blood cell fragility as well as enzyme modifications (Ex. 5A).

During the hearings on the proposed amendments to the episode regulations, medical testimony was received from Dr. Carnow, Dr. Edward J. Calabrese (Assistant Professor of Environmental Medicine at the University of Illinois Medical School and Assistant Director of Environmental Health Resource Center of IEQ), Dr. Kent K. Knock (Illinois EPA Toxicologist), R.A. Wadden, PhD. (University of Illinois Medical Center) and J.W. Masterson (Chief Statistician, Chicago Board of Health).

The witnesses and their supporting exhibits stressed the importance of the fact that most research in the area involved healthy, low risk, members of the population. Therefore, the results of the research may not adequately reflect the danger to that portion of the population in the high risk categories. High risk categories would include young people, those carrying on heavy physical activity, people with asthma, chronic bronchitis, emphysema, heart disease, smokers, glucose-6-phosphate dehydrogenase (G-6 PD) deficient persons, and persons with dietary deficiencies with respect to vitamins C and E, protein, and selenium (Ex. 5A).

Human exposure to 0.5 ppm of ozone for three hours per day, six days a week for twelve weeks, resulted in a decrease in lung capacity for as long as six weeks after exposure. Two hour exposure to 0.37 ppm resulted in a significant decrease in lung capacity for over 90% of the people tested (Ex. 5A and 7).

In a study of Los Angeles student nurses, daily eye discomfort increased as daily maximum photochemical oxidant levels exceeded 0.15 to 0.19 ppm. Cough and chest discomfort remained relatively constant until 0.30 to 0.39 ppm, at which time the rates of both symptoms increased markedly. Headache without fever began a slight but constant increase at levels of 0.1 to 0.14 ppm and marked acceleration occurred at 0.30 to 0.39 ppm. (Ex. 25)

The American Conference of Governmental Industrial Hygienists concluded that ozone is a "highly injurious and lethal gas at relatively low concentration (a few ppm) and at short exposure periods (a few hours)." At lower concentrations, ozone may "initiate, accelerate or exacerbate respiratory tract disease of bacterial origin." Although there is no manifest injury at concentrations of 0.1 ppm, this level may result in premature aging similar to continued exposure to ionizing radiation (Ex. 21).

In a study of athletic performance in the Los Angeles area, the only correlation shown between poor performance and pollution levels was in connection with oxidant levels one hour before the race (Ex. 21).

It has been shown that ozone affects red blood corpuscles and the release of oxygen hemoglobin (Ex. 5A), and that it also results in chromosome breakage at a very high rate (Ex. 5A, R.116).

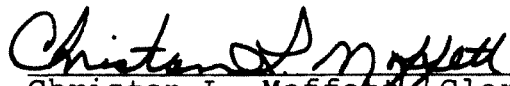
It has also been shown that ozone and sulfur dioxide act synergistically. Using maximal expiratory flow rate (MEFR) at 50% vital capacity as an index, it was found that, at 0.37 ppm ozone, a two hour period was needed to show a significant effect of MEFR. However, when 0.37 ppm SO<sub>2</sub> was also present, only 30 minutes passed before substantially similar effects occurred. (Exs. 5A, 25, and R.150). In addition, as mentioned previously, persons with a G-6 PD deficiency would have an acute hemolytic response when exposed to 0.3 or 0.4 ppm ozone for not more than 3 hours. It is significant that thirteen percent of the black population in Cook County or 240,000 persons in the Chicago Area have this deficiency (R155-6).

From the foregoing review of the record, the Board must conclude that ozone is a dangerous pollutant, not only at high concentrations (that is, above 0.37 ppm) but also at lower concentrations where symptoms are less pronounced. Based on this record, the Board suggests that the level for a Yellow Alert and Red Alert be reviewed for possible change consistent with this record. For instance, a 0.15 ppm ozone level may be representative of one of the dangerous "plateaus" as indicated in this record, and a level of 0.35 or 0.37 ppm of ozone may be another such dangerous "plateau."

With respect to the proposed strategies at the Yellow Alert Level, the Board feels that there is insufficient evidence upon which to base the assumption that such strategies will indeed result in a lowering of the ozone level. Such strategies may be appropriate at a Red Alert or Emergency Level, where imminent damage to the population in general would promote the use of any strategy that might conceivably be effective in lowering the ozone level. The equities at the lower Yellow Alert Level, however, would seem to lie with the proposition that a questionable set of strategies which are likely to cause considerable disruption to the communities upon which they are imposed is not a viable solution to the problem. At the Yellow Alert Level, suitable regulations calling for voluntary reductions in certain areas, along with mandatory reductions in areas least likely to cause community disruption, should be considered by the Agency.

The Board urges the Agency to re-evaluate their proposed amendments in light of the very latest information available (including any update of Federal information) and the data accrued during the ozone season of 1975.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion was adopted on the 29<sup>th</sup> day of September, 1975 by a vote of 4-0.

  
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Christan L. Moffett, Clerk  
Illinois Pollution Control Board