SCHOOL OF LAW
CASE WESTERN RESERVE UNIVERSITY

Canada-United States Law Journal

Volume 5 | Issue

Article 13

January 1982

An Industrial Perspective

Buddy A. Beach

An Industrial Perspective

*by Buddy A. Beach**

You probably remember hearing a few weeks ago about the case of Aaron Lee Owens. He is a man from Oakland, California who in 1972 was sentenced to life in prison for murdering a man and woman. He was recently released from prison after serving eight years when it was proved that he was actually innocent of the crime for which he had been sentenced. No amount of apology can square things with Aaron Lee Owens.

Today the utilities that own and operate the existing coal fired plants in the Ohio River Basin and the coal companies that currently supply these plants have a lot in common with the position of Aaron Lee Owens in 1972. These power plants and mines are on the verge of being found guilty of causing acid rain and the environmental damage that it is thought to be creating, mainly in the Adirondacks and Ontario. If the principal of "innocent until proven guilty" is abandoned in this case and the sentence is handed down and carried out, as in the case of Aaron Lee Owens, it is entirely possible that in a matter of a few years it will be proved through scientific studies that the power plants and mines were actually innocent of the crime for the most part. However, once again, no amount of apology will undo the economic damage that will have been done by mandating additional controls.

An extensive analysis of potential acid rain control options prepared by the Environmental Law Institute for the National Commission on Air Quality concluded that a program of SO_2 scrubber retrofit of 50 major power plants would produce the greatest reduction of emissions. Let me quickly point out that there is no evidence that reducing SO_2 emissions would alleviate any acid rain problem. This is only a hypothesis. The Environmental Law Institute report estimates retrofit of the 50 largest coal fired power plants could reduce SO_2 emissions by 6,217 to 8,480 kilotons per year. This would require a capital investment of $7 billion to $14 billion and result in an annual operating cost of $1 billion to $2 billion.

Some of the other control options considered by the Environmental Law Institute would be less costly, but some would be only moderately effective in reducing SO_2 emissions. Others would result in substantial economic disruption, such as, the closing of high sulphur coal mines due to switching to low sulphur coal. While we can't project what effect these emissions controls would have in reducing acid rain, we can confidently project that the economic impact would be great.

Let's focus on one 500 megawatt plant in the Midwest that is burning

---

* Vice-President, Environmental Affairs, Consolidation Coal.

local coal. To obtain a 70 percent reduction in SO_2 emissions, more than $76 million in capital would be required to retrofit a scrubber. The operation and maintenance costs for the scrubber would be more than $11 million per year.

Several things need to be kept in mind when evaluating any control scenario:

First, who pays? In the United Stated advocates of increased SO_2 controls would target the affected utilities to pick up the tab. In Canada apparently the government will be the big paymaster.

Second who benefits? Certainly not the rate payers. Should the rate payers of Ohio, Indiana and Illinois pay for uncertain benefits in Ontario and New York?

Third, can the utilities finance extra controls? Most of the utilities in question are in serious financial shape, unable to obtain capital at favorable terms and hampered by public utility commissions, rules and regulations. Any mandated retrofitting of scrubbers would have to be accompanied by legislation allowing the utilities to obtain the necessary financing.

Fourth, if fuel switching is allowed, how will the investments in reserves and physical plants be recovered by the owners of the displaced fuel source?

Finally, the $64 billion question is, will we obtain any improvement in acid lakes? In a United Kingdom study, given the worst case assumption that there is a one to one conversion from SO_2 emissions to acid rain to acid lakes, a 50 percent reduction in SO_2 emissions, at an enormous cost, resulted in a projected ph improvement of only plus 0.2 in the lakes.

I suspect that many of the "stop acid rain" and "acid rain go home" sign wavers believe that natural unpolluted rainfall should be ph 7, but in fact, it has already been mentioned today that that is not the case. Rain is naturally acidic as a result of carbon dioxide in the atmosphere and such things as the natural decay of vegetation, sea spray, lightning and active volcanos. Now scientists generally agree that the natural ph of rain is no higher than ph 5 and many believe that it could be as low as ph 4.7.

This result was demonstrated recently by two researchers at the University of New Hampshire. They measured the acidity of precipitation in 350 year old ice cores from the Himalayas and the Antarctic. They obtained ph values in the low 5's. The facts are, first, that natural sources have a significant impact on precipitation acidity and second, that acid precipitation has been around for a very long time. I am not denying that there is an acid problem, but I am raising questions about man's contribution to it.

Contrary to the studies of Likens and Cogbill and others, I believe that the acidity of rain has not been increasing rapidly. We analyzed the same basic data used by Likens and Cogbill and we reached quite different conclusions. We used the data from a group of acid rain monitoring stations operated by the U.S. Government in the New York area from

1965 to 1978.

This sampling network was selected because it is in the Adirondack region where much of the concern over acid rain centers, and also because it is the only sampling network that operated on a continuing basis from 1965 to 1977 when the acidity of the rainfall in this area is purported to have increased. We plotted on a monthly basis the ph levels of the rainfall at each of the nine stations in the government study over a 10 year period beginning in 1965. When we analyzed the data for each specific point we could find no clear trend in acidity levels. For example, one station showed a slight decrease in acidity. The remaining seven stations showed no change in ph levels.

This data demonstrates an important fact; the level of acidity in rainfall varies considerably in the Adirondack region year to year. Depending on which two years are compared, it is possible to infer either that acidity has increased or that it has decreased. Yet the data for the entire 10 year period shows no change in the amount of acidity in the rainfall. Looking at the existing valid data as objectively as we can, we can conclude only that rain is frequently acidic. We doubt, however, that acidity is increasing rapidly.

Hansen and Hidy of Environmental Research and Technology in a recent study conducted the most thorough and comprehensive critical analysis yet of the Cogbill and Likens ph maps. They went through the 1950's, 60's and 70's. The results of this study have shown that the available data are not of sufficient quality to support any trends in acidity change even over the past 50 years in the eastern United States. The observations, however, do show that precipitation over this region is definitely acidic; it is probably more acidic than would be expected from natural sources.

To what extent does coal burning contribute to the acidity of rainfall? The fact is that we just don't know. We do know that the amount of coal burned in the early 1970's was only modestly more than the amount burned in the early 1950's, yet this is the same time frame in which rain acidity according to the Council on Environmental Quality increased 5,000 percent. Likens and his co-workers allege that the acidity of rainfall in the New York-New England corridor has increased substantially during the 1970's; and that the effected area has spread during the same time period because of coal fired utilities. Contrast these allegations with the following U.S. EPA emissions information for the 1970's:

Power plant emissions account for a significant portion of total particulate, sulphur dioxide and nitrogen oxide emissions.

In 1970, electric utilities consumed approximately 317 million tons of coal; by 1978, this figure was about 470 million tons. Despite this increase in coal consumption, particulate emissions decreased 39 percent.

Utility use of coal increased about 50 percent and residual oil use increased about 75 percent between 1970 and 1978. Sulphur dioxide emissions from utilities, however, increased only 11 percent.

The trends in utility emissions of particulate matter and sulphur dioxide between 1970 and 1978 indicate the effect of new source performance standards and improved controls on existing sources.

EPA data shows that ground level concentrations of SO_2 in the United States atmosphere actually declined during the 13 year period between 1964 and 1977.

The National Commission on Air Quality recently summarized the 1970's in this way:

> In summary the trends between 1970 and 1978 in nationwide emissions totals for all economic sectors show that particulate and sulphur dioxide emissions have fallen approximately 50 percent and 10 percent respectively. Nitrogen oxide emissions have risen approximately 17 percent and hydrocarbon and carbon monoxide emissions have remained essentially unchanged. The amount of fuel consumed, particularly coal has increased nationwide since 1970. However, the application of stationary and mobile emissions control measures during this period had resulted in the reduction or stabilization of all pollutant emissions except nitrogen oxides, which have not been controlled from stationary sources until recently.

Any reasonable individual must begin to realize that even when you accept that there is an effect in the form of fishless lakes, the alleged cause, coal fired power plants, and the alleged link, long range transport, have not been established. In fact, emissions data from the 1970's seem to indicate that there is no direct cause and effect.

The EPA also projects that east of the Mississippi River, where the greatest concern over acid rainfall exists, total sulphur dioxide emissions will continue to decline through 1990, because of controls already enacted. It is difficult to comprehend how critics of coal burning can ignore the apparent flaw in their cause-effect argument. In Europe where rain acidity has been monitored for several decades, sulphur dioxide levels have increased some 35 percent in the past 15 years, but during that same period there has been no measured increase in the acidity of rainfall.

It is true that there are many fishless lakes in Ontario and the Adirondacks. However, those bodies of water that supposedly have been impacted by acid precipitation are located in areas with geological formations that offer little resistance to acid. Their waters are typically low in calcium, cannot buffer influxes of acid, and may have always had low ph's.

Many of the Adirondacks lakes that have recently exhibited declining or lost fish populations were always marginal for fish due to natural low ph, low calcium and resultant low biological productivity at all levels of the food chain. Many of these lakes were, in fact, fishless before man decided that they ought to have fish for the sportsman. While some of the higher elevation lakes originally lacked fish because they were inaccessible to breeding stock, others were probably just not well suited for fish.

The most often quoted investigators of the Adirondack lake acidification problem have noted that most of the lakes that have been lost for fish production were marginal in the first place.

If one were to make a case for restoring the lost marginal Adirondack lakes to fish production, one cannot help but conclude that the cost of liming and stocking these lakes would be but a small fraction of the $7 billion to $14 billion estimated to retrofit these 50 large power plants with scrubbers. Without question the extremely high levels of air pollution in localized areas can cause severe damage to aquatic life and even terrestrial vegetation. I believe that considering the lack of evidence correlating acid precipitation and coal fired power plants, there is no rationale at this time for expensive SO_2 control programs which probably would not substantially improve conditions in areas of documented acidification, such as marginal lakes of the Adirondacks.

Unlike the case of Aaron Lee Owens, in the case of the Ohio River Basin power plants the jury is still out. Reason demands that we take the necessary time to find clear answers to the questions that have been raised about acid rain, before imposing staggering control on our inflationary economy.