ILLINOIS POLLUTION CONTROL BOARD
May 24, 1979

IN THE MATTER OF A PROPOSAL TO RELAX THE SULFUR CONTENT IN RESIDUAL AND DISTILLATE FUEL OIL IN ILLINOIS, EXCEPT COOK COUNTY	))))	R75-8

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

On April 14, 1972, the Illinois Pollution Control Board (Board) adopted the Emission Standards of the Air Pollution Control Regulations, Chapter 2 of the Board's Rules and Regulations. The standards included Rules 204(b)(2) and 204(c)(2), sulfur dioxide emission standards for smaller new and all existing fuel combustion emission sources burning liquid fuel exclusively. On May 30, 1975, Petitioners herein, pursuant to Section 28 of the Environmental Protection Act (Act) proposed to amend Rules 204(b)(2) and 204(c)(2) of Chapter 2. The proposal was accompanied by the requisite number of signatures, and on June 26, 1975, the Board authorized it for hearing. Hearings were held on September 30, 1975, in Edwardsville, October 26, 1976, in Springfield, and January 17 and 24, 1977 in Chicago. On January 6, 1977, the Board ordered Petitioners to answer certain interrogatories. The answers were received on January 19, 1977.

The Board received the economic impact study of this proposal on December 2, 1977. The study, IIEQ Document No. 77/30, is entitled "Economic Impact of Relaxing the Regulation on Sulfur Content of Fuel Oils." Economic impact hearings were held on March 21 and April 24, 1978, in Chicago and Springfield, respectively.

Petitioners propose to amend Rules 204(b)(2) and 204(c)(2) in the following manner:

1. Amend Rule 204(b)(2) to read as follows:

"(2) Liquid fuel Burned Exclusively. (A) Except as provided in subparagraph B of this part, ~~N~~no person shall cause or allow the emission of sulfur dioxide into the atmosphere in any one hour period from any new fuel combustion source with actual heat input smaller than, or equal to, 250 million btu per hour, burning liquid fuel exclusively:

~~(A)~~ (1) to exceed ~~1.0~~ 1.3 pounds of sulfur dioxide per million btu of actual heat input when residual fuel oil is burned; and

~~(B)~~ (2) to exceed ~~0.3~~ 0.5 pounds of sulfur dioxide per million btu of actual heat input when distillate fuel oil is burned.

(B) No person located within Cook County Illinois, shall cause or allow the emission of sulfur dioxide into the atomsphere in any one hour period from any new fuel combustion source with actual heat input smaller than, or equal to, 250 million btu per hour, burning liquid fuel exclusively:

(1) to exceed 1.0 pounds of sulfur dioxide per million btu of actual heat input when residual fuel oil is burned; and

(2) to exceed 0.3 pounds of sulfur dioxide per million btu of actual heat input when distillate fuel oil is burned."

2. Amend Rule 204(c)(2) to read as follows:

"(2) Liquid Fuel Burned Exclusively. (A) Except as provided in subparagraph B of this part, ~~N~~no person shall cause or allow the emission of sulfur dioxide into the atmosphere in any one hour period from any existing fuel combustion emission source, burning liquid fuel exclusively:

~~(A)~~ (1) to exceed 1.0 pounds of sulfur dioxide per million btu of actual heat input when residual oil is burned; and,

~~(B)~~ (2) to exceed 0.3 pounds of sulfur dioxide per million btu of actual heat input when distillate fuel oil is burned.

(B) No person located outside of Cook County, Illinois, shall cause or allow the emission of sulfur dioxide from any existing fuel combustion source with actual heat input smaller than, or equal to, 250 million btu per hour, burning liquid fuel exclusively:

(1) to exceed 1.3 pounds of sulfur dioxide per million btu of actual heat input when residual fuel oil is burned; and,

(2) to exceed 0.5 pounds of sulfur dioxide per million btu of actual heat input when distillate fuel oil is burned."

Petitioners in this matter, as listed on the Petition, are: Apco Oil Corporation, Champlin Petroleum Company, Continental Oil Co., CRA, inc., Explorer Pipeline Co., FS Services, Inc., Kerr-McGee Corp., Phillips Petroleum Co., Skelly Oil Co., Sun Oil Co., Texaco Inc., Union Oil Co. of California, and Williams Pipeline Co. Petitioners indicate in their Statement of Reasons Supporting Proposal that they are collectively engaged in the refining, transportation and distribution of distillate and residual fuel oils marketed in Illinois.

In their Statement of Reasons, Petitioners assert that recent oil product tests indicate that the sulfur content of distillate and residual fuel oil transported for possible distribution and marketing in Illinois is increasing to the extent that it increasingly exceeds 0.3 and 1.0 percent, respectively. Petitioners attribute this increase in sulfur content to reduced availability of low sulfur crude oils in refineries serving midwestern states, including Illinois. Petitioner refiners contend that retention of the current standards would force them to either install very costly desulfurization and related equipment or discontinue shipment of distillate and residual fuel oil into Illinois. In the alternative, Petitioner pipeline companies could increase their present ability to segregate and/or blend fuel oil products to supply low sulfur fuel areas. Such an approach would allegedly require costly installation of additional piping and tankage at all loading and distribution points and would be viable only so long as low sulfur fuel oil components are available and the demand for low sulfur fuel remains minimal.

Before beginning our discussion of the record, it should be noted that the rules in question regulate the amount of sulfur dioxide emitted, but the discussion in the record focuses on the sulfur content by weight of distillate and residual fuel oil. Sulfur dioxide emissions from fuel combustion sources are directly proportionate to the percent sulfur content of fuel oils by weight as follows: for sulfur dioxide emissions of 0.3 pounds per million BTU's of actual heat input from burning distillate fuel oil, the sulfur content by weight would be 0.29; for emissions of 1.0 pounds per million BTU's from burning residual fuel oil, the actual sulfur content by weight should be no more than 0.925 percent (R.17).

Mr. Robert Lindsay of Phillips Petroleum Company testified on behalf of Petitioners about the global crude oil picture, including domestic and foreign production (R.28-49). During the three years preceeding 1975, the average sulfur content of refinery crude Mr. Lindsay was concerned with increased .3 percent, from .7 to well over 1 percent sulfur (R.36). Mr. Lindsay concluded that, based upon the global

crude oil picture, the only method by which refiners can produce products with low sulfur is the installation of additional desulfurization equipment (R.37).

Mr. H.L. Teel of Williams Pipeline Company in Tulsa, Oklahoma, testifying on behalf of Petitioners, described generally the mid-continent pipeline operations of his company's system, which is a fungible product system, and of Explorer Pipeline Company, which is a segregated product network (R.65). In 1974, Williams shipped 1.8 million barrels of number two oil to Williams-owned terminals and 2 million barrels to shipper-owned terminals. Mr. Teel submitted data indicating that for five midwest Williams-owned terminals for the period of March, 1974, through February, 1975, portions of the number two burner oil handled exceeded the limits (R.70).

The two solutions available to product pipeline companies to assure availability of fuel oil complying with the Illinois standards are segregation of low and high sulfur fuel oils or blending of high sulfur oils with products low enough in sulfur content that the blended product conforms with the Illinois limitations (R.71). Segregation depends upon a sufficient supply of low sulfur oils by shippers to meet the demands. Williams estimates that, in order to assure oil complying with Illinois limits by means of segregation, it must spend a minimum of $8 million over a period of two years to construct necessary additional facilities, including additional tankage and loading facilities at Williams-owned terminals and at least one additional pipeline segment. This amount does not include the additional tankage that may be required at shipper-owned terminals (R.73). In addition, Williams would require up to an additional two weeks advance notice prior to actual pumping (R.73). For the segregated product pipeline systems such as Explorer Pipeline, additional pipeline segments would not be necessary, but additional tankage and loading facilities would be. Explorer estimates that it would have to expend a minimum of $2.2 million for added tankage alone to segregate two grades of number two burner oil at two of its terminals (R.75).

Blending is not a viable alternative for segregated product pipeline operations such as Explorer. Blending depends upon an adequate supply of low sulfur number one fuel in order to provide sufficient product upon demand. Since 1973, the volume of low sulfur number one fuel oil offered for Williams transportation has declined at the rate of 19 percent annually (R.76). However, even if the requisite blending stocks are available at originating locations, problems remain (See R.75-78). Also, reliance upon blending would require that each pipeline install additional testing at each delivery terminal in order to achieve the proper mix (R.78).

Mr. Dick McDowell, Chief Engineer at Union Oil's Chicago refinery, discussed the typical refining process, including desulfurization (R.125). He introduced a chart of a "typical" refinery flow distribution with 2% crude. In the example used, the final product has a sulfur content of 0.53 percent. In order to further reduce the sulfur content in order to meet the Illinois limitations, several alternatives are available. A refinery may add an additional desulfurizer, which would allegedly take approximately 3 years to design and build and, for a unit processing 10,000 barrels a day, would cost $8-10 million. In addition, some refineries may require installation of adsorption facilities and a sulfur unit (R.130). Other alternatives include obtaining crude with a sulfur content of between .5 and 1 percent, if possible, rather than the 2% used in the example, blending products with a lower sulfur content with the number 2 fuel oil or removing one of the high sulfur components, or reducing the crude throughput (R.132). The latter two alternatives will create problems in product distribution (R.131).

On behalf of Union Electric Company, Mr. Jerrell Smith testified that the company's Venice Power Plant, which has six oil-fired boilers, has had difficulty meeting the Illinois limitations (R.187). Mr. Smith stated that the company could comply with the limitations if it were willing to expend the money to obtain the lower sulfur oil, but that local refineries have been unable to provide it (R.193-195).

An air quality impact study was prepared on behalf of Petitioners by Environmental Technology Assessment, Inc. (ETA) (Exhibit 11). The Climatological Dispersion Model (CDM), which is a part of the UNAMAP system of the U.S. EPA, was used to model the change in SO_2 air quality in the Chicago and St. Louis MMA's as a result of the proposed regulation. The area source emissions data for fuel oil sources were developed by ETA using surrogate variables for fuel oil useage and results of a survey of two trade associations. Determinations of possible violations of ambient air quality standards was made by adding the estimated increases in SO_2 from these sources, as a result of changing the regulation, to the measured existing air concentrations of SO_2 at monitoring stations in the MMA's. The monitored data reflect all existing sources of SO_2 emissions, and the modeled increment is the additional contribution from small fuel oil sources which would result from putting the proposed regulation into effect. According to ETA the results of the analysis are "worst case" estimates of air quality impacts, based on use of a state-of-the art dispersion model and a number of conservative assumptions in modeling work.

The modeling analysis of the Chicago and East St. Louis areas determined that the maximum annual SO_2 contribution caused by the proposed regulation would be approximately 3.4

micrograms per cubic meter at Waukegan, which is 4.3% of the annual standards. The maximum 24-hour incremental contribution predicted was 18.1 micrograms per cubic meter at the Maywood monitor, which is 5 percent of the 24-hour short-term SO_2 standard. The maximum 3-hour incremental contribution predicted was 54.4 micrograms per cubic meter, also at the Maywood monitor, which is about 4.2 percent of the corresponding SO_2 standard. The SO_2 contribution from the proposed regulation would not cause any monitors which are currently below the ambient air quality standards to exceed the long or short-term standards. Finally, SO_2 levels already exceeding the short and long-term standard would be increased less than 2.3 percent in all cases (R.235-236).

The author of the economic impact study (Ex.12) concluded that continuation of the current regulation would result in an increase of 5 to 10 cents per gallon of fuel oil, which would be 15 to 30% above current prices. This price increase would amount to a total increase of $150 to $300 million to Illinois fuel oil users. This cost was based upon the cost of additional desulfurization equipment that he assumed would need to be installed and the author's determination that this cost would be passed on to customers. The author also concluded that the residential heating oil portion of the costs would amount to $75 to $150 per year per household or 0.7 to 1.4 percent of average pre-tax household income. The author used the Illinois Bureau of the Budget 1972 Input/Output Model to estimate the increased costs of goods and services resulting from application of the current regulation. The model results showed that the fuel oil cost increase would cause inflation of up to $110 million in the total 1972 Illinois consumption expenditure of $45 billion.

The author noted that no environmental benefits would result from the proposed regulation. Environmental costs investigated were health, ecological and material costs. The author concluded that changes in some health effects indices caused by enacting the proposed regulation, including increases in mortality rates and decrease in pulmonary functions, were highly unlikely and that changes in several other indices, including general morbidity rates, were impossible to predict. The author predicted no economic loss to agriculture but did estimate that total material damage costs in Illinois resulting from the proposed regulation would range from $1 to $20 million with a best estimate of roughly $4 million.

Having reviewed the testimony and exhibits, the Board finds that it does not have enough information at the present time to allow it to make a decision in this matter. Although the record contains much conclusory information, it contains little of the data necessary to give the Board a representative picture of the industry and to convince the Board of the necessity for the proposed change.

First of all, aside from the discussion of available crude oil from which residual oil is refined, the record contains no information on residual oil. Williams and Explorer ship only distillate (R.102), and the No. 2 fuel oil discussed by Union Oil is also distillate (R.133). The record contains little information on the quantities or sulfur contents of residual oils consumed in Illinois, where they are refined, what desulfurization capability those refineries have, or methods of transport. As to the world crude oil picture, the record contains no data on the quantity and sulfur content of fuel oil consumed annually in Illinois itself over the last several years and the effect worldwide changes will have on the sulfur contents of crudes used in Illinois.

As to the product pipeline companies and the problems they face in supplying oil which complies with Illinois standards, testimony presented concerned only the Williams and Explorer Pipeline Companies. Mr. Teel indicated that there are other pipeline companies serving Illinois, but he did not know how many (R.88). The Board has no means of assessing whether the problems faced by Williams and Explorer are indeed representative of industry as a whole. The record lacks an inventory of product pipelines transporting distillate oil to Illinois purchasers, capacities of the pipelines, storage capacities at receiving terminals, capability of segregating low sulfur fuels during transport and storage, capability of blending oils to obtain compliance, and the cost of such blending and/or segregation.

Information in the record on refineries serving Illinois is equally scant. The record lacks an inventory of refineries producing oil for Illinois, the quantity and sulfur content of oil received and produced by each refinery, present desulfurization capacities of the refineries and how much of that capacity is being used, the flexibility in the refining process itself to allow for blending of products, and the cost for each refinery of additional equipment, if necessary, in order to produce oil complying with the current standards.

The record contains no evidence on the sulfur standard applicable in other states which Petitioners supply and no explanation of why the sulfur standard is proposed to remain unchanged for Cook County. Finally, the record is devoid of information or testimony, other than that presented by Union Electric, on behalf of sources to whom the regulatory proposal would apply and their current or prospective inability to meet the limitations.

The author of the economic impact study specifically noted at page 16 of the study (Ex. 12) that:

> "Customarily, in proposing a regulation, the petitioner lays out not only the benefits but also the rationale or

evidence on which these benefits are based. In this case, the petitioners were unwilling to provide the supporting evidence necessary to determine the validity of their claims."

The author assumed that existing Illinois-supplying refiners were at or near desulfurization and fuel oil blending capacity. However, the author noted that this fact was indeterminant (Ex. 12, p.17). Furthermore, the author found that the evidence appears to substantiate petitioners' contention that substantially all middle distillate components would have to be treated. However, we find that the author's conclusion in this regard was based upon speculation and was not substantiated by evidence obtainable only through petitioners.

The Board attempted to obtain much of the requisite information in the Interrogatories it ordered Petitioners to answer. The answers were insufficient, and the Board has no other means of obtaining it.

On May 16, 1979, Petitioners filed a Motion for Substitution of Counsel, Reopening of the Record and Identification of Information. The Motion is hereby granted. The Board will allow petitioners six months from the date of this Order to submit the information which the Board has herein identified as necessary for it to decide this matter. In providing the requisite information, Petitioners should update information in the record and should complete and update answers to the interrogatories addressed to Petitioners by the Board previously. The Board orders that another hearing be set in this matter at which Petitioners may present this information. Failure to submit the requisite information within six months will subject this proposal to dismissal.

ORDER

It is the Order of the Pollution Control Board that:

1) The Motion for Substitution of Counsel, Reopening of the Record and Identification of Information, filed by Petitioners on May 16, 1979, is hereby granted. Petitioners shall submit the information identified in the above Interim Opinion within six months of the date of this Order. Failure to submit the requisite information shall subject the petition to dismissal.

2) An additional hearing shall be held in this matter within six months of the date of this Order.

Dr. Satchell abstained.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Interim Order was adopted on the 24th day of May, 1979 by a vote of 4-0.

Christan L. Moffett

Christan L. Moffett, Clerk
Illinois Pollution Control Board