ILLINOIS POLLUTION CONTROL BOARD
November 18, 1983

CPC INTERNATIONAL, INC.	)	
	)	
Petitioner,	)	
	)	
V.	)	PCB 82-153
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

PERCY L. ANGELO, MAYER, BROWN & PLATT, APPEARED ON BEHALF OF PETITIONER;

PETER E. ORLINSKY APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by J. Theodore Meyer):

CPC International, Inc. (CPC) initiated this proceeding on December 30, 1982 by filing a petition for relief from sulfur dioxide limitations for its two sources in the Chicago major metropolitan area. At that time the sulfur dioxide rulemaking docketed as R80-22 was in Second Notice pursuant to the Administrative Procedure Act (Ill. Rev. Stat. 1981, ch. 127, pars. 1005.01(b)). The proposed rules were subsequently adopted as final by the Board on February 24, 1983 and effective on March 28, 1983. Adopted therein at Rule 204(f) (hereinafter 35 Ill. Adm. Code 214.141 as codified) was a 1.8 pounds per million British thermal unit (lbs/mbtu) limit for sulfur dioxide emitted from existing fuel combustion sources burning exclusively solid fuel in the Chicago major metropolitan area. A method for these sources to obtain an alternative limitation was also adopted at Rule 204(g) (hereinafter 35 Ill. Adm. Code 214.201 as codified). Thus, prior to adoption, CPC had filed a Petition for Variance from the then proposed limit of 1.8 lbs/mbtu and a Petition for an Alternative Standard pursuant to then proposed rule for its Bedford Park Illinois facility.

On January 12, 1983 the Illinois Environmental Protection Agency (Agency) moved to dismiss the Variance petition as prematurely filed. CPC filed its Response on January 24, 1983. On January 25, 1983 it moved to stay the proceeding until the effective date of R80-22, whereupon the Agency would agree to withdraw its motion. On January 27, 1983 the Board ordered that the

Petition for an Alternative Standard and the Petition for Variance be docketed separately (PCB 82-153 and PCB 83-11, respectively); that CPC file a Variance petition distinct from the combined petition already received; and that proceedings in both matters be stayed. On March 16, 1983 CPC filed a Supplement to its original filing which the Board later accepted as the requested Variance petition. On March 28, 1983 CPC moved to lift the stay and to consolidate hearings on both petitions. On April 7, 1983 the Board lifted the stay, but denied consolidation since the relief sought and elements of proof differed for each petition. Hearing on the Alternative Standard petition was held on June 3, 1983 in Chicago. A second hearing was held on September 12, 1983 to provide the additional information requested by an August 18, 1983 Board Order.

CPC owns and operates a corn wet milling plant on approximately 300 acres in Bedford Park, Illinois. Employing approximately 1550 people, CPC processes approximately 100,000 bushels of corn per day into finished products including corn sugar, corn starch, corn oil and corn syrup. The necessary steam and energy is generated by three dry-bottom pulverized coal fired boilers, each having a rated capacity of 330 mbtu/hour. Two boilers are vented through one stack and the third is vented through a second stack (R.43). Both stacks are 250 feet high, which constitutes good engineering practice, and are equipped with hotside electrostatic precipitators to control particulate matter (R.44). To meet a 1.8 lbs/mbtu sulfur dioxide emission limit, in the past CPC has burned low sulfur coal, that is, coal with an estimated sulfuric content of less than 1%. (R.45) Based on CPC's December, 1981 through November, 1982 purchases it annually burns approximately 300,000 tons of coal at an approximate cost of $51.00 per ton. (R.54)

CPC estimates that low sulfur coal is $10 - $18 per ton more expensive than medium sulfur coal which is available from Illinois' reserves. So that CPC may burn the latter, with an estimated sulfuric content of 3%, CPC is requesting that an alternative limit of 6.0 lbs/mbtu be applied to its Bedford Park sources. Under Section 214.201, CPC bears the burden of proving in an adjudicative hearing that its proposed limit will not cause or contribute to a violation of the primary or secondary air quality standards or of any applicable Prevention of Significant Deterioration (PSD) increment. If this relief is granted pursuant to the Section 214.201 process, the alternative limit is to be included as a condition to CPC's operating permit.

To sustain its burden of proof, CPC used modeling analysis to demonstrate that a relaxed limit of 6.0 lbs/mbtu would not violate the 3 hour or 24 hour ambient air quality standards for sulfur dioxide. (Exhibit 19). CPC premised its modeling on a recent study by the Agency for sulfur dioxide in the Chicago major metropolitan area. (Ex. 4). This same study had been intro-

duced and relied on in setting the Chicago limit of 1.8 lbs/mBtu in R80-22. The dispersion model, MPTER, included background concentrations for the area, surface observations from Chicago Midway and mixing heights from Peoria from 1973 to 1977, and the impact of Bedford Park's sources at an assumed emission rate of 1.8 lbs/mbtu. Therefore, using MPTER, and the same meteorological data, CPC modeled the incremental increase in emissions and added these to the Agency's analyzed base values to discover possible points of violations. Given CPC's request for a relaxed limit of 6.0 lbs/mbtu the incremental increase amounted to 4.2 lbs/mbtu. Since both stack heights constitute good engineering practice, CPC's study did not evaluate possible building downwash.

The Agency's study had assessed impacts at 700 receptors. Attainment was considered achieved if the total concentration predicted at a receptor was below 80% of the ambient air quality standard. This assured a 20% growth margin. At the outset of CPC's study, the number of receptors was reduced to 90. Only those receptors within 10 kilometers of the CPC facility were retained to be studied along with four monitoring stations near CPC. Thereon the analysis, in a four part process, identified those receptors where concentrations could exceed the 80% value, and eliminated from further study those that did not. At the first step the five highest 3 hour and 24 hour concentrations at each of the ninety receptors were determined. The impacts, with one exception, were less than or equal to 30% of the respective standard. Therefore, receptors originally modeled by the Agency to have concentrated impacts of less than 50% of the standards were eliminated, reducing the number of receptors remaining to be studied by CPC to 39. The next step was to add the highest incremental values determined by CPC to the second highest concentrations determined by the Agency for each of the remaining receptors. Where the sum did not exceed 80% of the standard, the receptors were eliminated from further study. Eleven receptors remained, 7 of which required further analysis for both the 3 hour and 24 hour standards.

The fourth step involved a two-part screening process. The highest incremental concentrations determined by CPC were added to the Agency's concentrations for both the 24 and 3 hour standards. If the sum indicated potential concentrations less than 80% of the respective standard, the receptor was eliminated. If the result was greater than 80% of the respective standard, a day to day analysis was performed. That is, CPC's values were added to the Agency's values for the same modeled day. At each receptor the results were negative for both standards. None of the eleven studied for the 24 hours standard exceeded 80% of the standard, and none of the seven studied for the 3 hour standard exceeded 80% of that standard. (R. 188-190)

In going from 90 receptors to the last step involving the eleven receptors, CPC's analysis was most conservative. The

twenty percent growth margin developed in the Agency's original analysis was maintained and secondly, it was not until the final step that CPC's highest incremental values were paired with the Agency's values for the same day and time. In each preceeding step the highest levels due to the incremental increase were added to second highest values determined by the Agency, regardless of the fact that they were not predicted to occur at the same time.

Two additional analyses were performed by CPC. The first was to identify points of high concentrations which may have been missed in the initial analysis. Concerned about one hour concentrations, 59 additional receptors were identified downwind from CPC during conditions of maximum concentrations. After determining the five highest 3 hour and 24 hour concentrations for each and again employing the same model and data used by the Agency, the concentrations were found to be similar to those at the Agency's receptors. Furthermore, the absolute highest concentrations occurred at receptors studied by the Agency. This result endorses the reliability of the receptor network originally used in the Agency's study, and subsequently scrutinized by CPC.

In the second additional, and final analysis, CPC evaluated the anticipated impact at the original receptors and the supplemental receptors for the years of 1973, 1974, 1976 and 1977. In so doing CPC duplicated the afore described analysis which had been based on 1975 data which is traditionally considered "worst case". The results for the additional four years were substantially the same as those for 1975. At none of the receptors were conditions predicted to be greater than 80% of the air quality standards.

Under the alternative standard process, consumption of PSD increments is to be evaluated, if applicable. In this instance the PSD program is not applicable since 40 CFR 51.24(b)(2)(iii)(e) removes CPC's intended switch to medium sulfur coal from the definition of a major modification. Nevertheless the PSD program is intended to insure a margin for new industrial growth and a hypothetical evaluation of CPC's consumption is therefore of value to the Board.

In the area of the CPC facility the PSD baseline has not yet been established. Assuming that this fuel switch or some other project had established a baseline, CPC's modeling analysis provides the information necessary to evaluate it under the PSD program. The PSD level for the 3 hour standard is 512 ug/m^3. Over the five year period studied the second highest 3 hour concentration was 350 ug/m^3 in the Agencys's analysis and 359 ug/m^3 after studying CPC's increased effect. The PSD increment level for the 24 hour standard is 91 ug/m^3. The second highest 24 hour concentration was 83 ug/m^3 according to the Agency's analysis, and 95 ug/m^3 by CPC's analysis. (Ex. 19 Table 6). Obviously, the predictions were far below the 3 hour

PSD incremental level, and in only the one instance cited marginally above the 24 hour level. The other four years' second highest predictions for the 24 hour concentrations were below the 91 ug/m^3 level.

It is possible that sources of sulfur dioxide near the CPC facility could intermix with its emissions to cause trouble spots. Three such sources, GM Electromotive, Western Electric's Hawthorne Works, and Commonwealth Edison's Ridgeland facility were reviewed and should be given special consideration by CPC, but each eliminated for individualistic reasons. Although GM Electromotive is within 10 kilometers of CPC, it was not predominantly downwind from CPC. Therefore CPC believed its modeling analysis to be sufficient to detect any potential violation. The Hawthorne Works are outside of the 10 kilometer mixing zone and therefore intermixing is unlikely. (R.116). Additionally, Hawthorne has announced its intention to close, which will in effect reduce sulfur dioxide emissions in the area. (R.196) Likewise, Commonwealth Edison has retired the Ridgeland facility and therefore CPC did not consider its emissions (R. 102, Ex. 23). At the time of its analysis, none of the sources near CPC had requested a relaxed limit pursuant to Section 214.201. CPC therefore did not include this possibility in its analysis. The closing of two nearby major sources reduces this possibility.

The Agency has requested that CPC be required to sample and average daily the sulfuric content of its coal. The Agency argues that daily averaging is necessary to satisfy the relaxation as a SIP amendment due to a United States Environmental Protection Ageny's (USEPA) letter of April 22, 1983 (Resp. Ex. 1). In summary that letter states that if emission limits are quantified in mass emissions per unit of time, then ambient air quality standards and PSD increments may be jeopardized should a source choose to use poorer quality fuel at reduced loads. To avoid this possibility, the letter suggests that emission limits be established in pounds of sulfur dioxide per unit of heat content (lbs/mbtu), or that modeling demonstrate the results at all feasible operating loads. At the very finish, the letter recommends the first option and in parenthesis qualifies that the per unit of heat content of the fuel be verified on a "daily average".

CPC argues that it cannot operate at reduced levels because the boilers must be fully loaded to meet production demands. (R.46) If and when CPC operates its boilers at reduced loads, it has testified that stack gas temperature and velocity are not appreciably affected because the same amount of heat must be generated to bring the process steam to the same temperature and pressure produced at full load. (R.47)

The alternative standard requested by CPC in this matter is quantified in mass emissions per unit heat content of the fuel. Given the USEPA's recommendation, further modeling for partial loads is, therefore, not necessary. Since the heat of the process

steam must be constant, it follows that exit velocity and heat of gases on full or partial load are much the same. The concern about reduced plume height and higher ground level concentrations is thus unfounded unless there is a malfunction.

In advocating daily averaging the Agency explained that the sixty day averaging rule was inappropriate for a single facility. Recognizing that individual facilities would experience variability in their coal's sulfuric content the rule allows 5% of the sixty days' samples to be greater than 20% of the average. The Agency alleges that the rule was developed assuming that amongst a multitude of sources it was unlikely that a sufficient number would be simultaneously exceeding the average to cause violations of the air quality standard. The Agency advises that CPC, a single facility, should not be given this 20% leeway on a two month basis because that would allow violations of its 6.0 lbs/mbtu limit, which is the rate modeled "just short" of air quality violations. (R.138).

Based on CPC's analysis occassional excursions over the 6.0 lbs/mbtu limit at its sources should not result in violations of the air quality standards. Overall modeling at the 6.0 lb/mbtu limit demonstrated that levels greater than 80% of the standards should not occur due to CPC's increased emissions. At only eleven receptors in the initial analysis was it demonstrated that the incremental increase might result in levels greater than 80% of the standard. Potential violations were eliminated at each once the conservative practice of adding CPC's highest results to the Agency's second highest results on any given day of the modeled year was eliminated. Also, the first step in the inital "worst case" analysis found that, with one exception, CPC's increased emissions contributed no more than 30% of the standard. It, therefore, stands that if the 6.0 lbs/mbtu limit is exceeded occassionally violations of the standards should not result whether CPC is considered alone or in combination with nearby and background sources. Based on CPC's analysis, the 20% margin and more is reserved so that it can be given the leeway of 20% coal variability 5% of the time over a sixty day period.

The conservative assumptions in and the results of the modeling analysis performed by CPC provides the Board with sufficient basis to grant it a 6.0 lbs/mbtu limitation for sulfur dioxide emitted from its two sources at Bedford Park, Illinois. Using dispersion modeling, which in itself is conservative, CPC considered the impact of increased emissions by a net change of 4.2 lbs/mbtu to emissions already determined by the Agency's modeling of the Chicago area. Although the "worst case" meteorology and operating conditions were used in both studies no violations of 80% of the applicable air quality standards were predicted. The potential for growth is also insured since the analysis' cutoff was 20% less than the actual standard, and the hypothetical PSD analysis indicated levels below the applicable increment levels. An alternative

limit of 6.0 lbs/mbtu is granted to CPC pursuant to Section 214.201. This level is to be a condition of the operating permit issued to CPC's Bedford Park facility's sources. That permit shall also contain a condition that Section 214.101(c) is the applicable measurement method to assure compliance.

According to CPC's figures it uses approximately 300,000 tons of coal per year and estimates a savings of between $3.3 and $5.4 million per year if allowed to substitute medium sulfur coal for more expensive low sulfur coal. CPC testified that it contacted more than twenty companies about purchasing medium sulfur coal, some in Illinois and some outside of Illinois (R. 67), but that it is the company's intention to purchase Illinois coal in keeping with Section 9.2 of the Act (Ill. Rev. Stat. 1981, ch. 111½, pars. 1009.2) (R. 68,79). In adopting the alternative standard process in R. 80-22 and in granting a relaxed limitation to CPC in this proceeding, the Board is implementing the intent of Section 9.2 of the Act which is "to enhance the use of Illinois coal, consistent with the need to attain and maintain the National Ambient Air Quality Standards...".

The Economic Impact Study accepted in R. 80-22 and in this proceeding (Ex. 7) used a multiplier to estimate the secondary economic benefits due to increased use of Illinois coal. In that study a multiplier of two was considered reasonable for a small region when the primary economic effects are substantial. (Ex. 7, p. 3-24) Although the primary effects generated by CPC's purchases are not necessarily substantial, if the same multiplier is employed the potential secondary economic impact is between $6.6 and $10.8 million per year. Section 9.2 of the Act does not mandate use of only Illinois coal when standards are relaxed. That power is also beyond the authority of the Board. Since it is the people of Illinois who will suffer from the resulting degradation in air quality, albeit not in violation of the applicable sulfur dioxide air quality standards, and the same who could benefit from the increased use of Illinois coal, CPC's relaxation is granted with the hope that CPC will purchase Illinois coal.

ORDER

It is the Order of the Pollution Control Board that CPC International, Inc. be granted an alternative limitation for sulfur dioxide for its Bedford Park, Illinois facility of 6.0 pounds per million British thermal units of heat input pursuant to 35 Ill. Adm. Code 214.101, subject to the following conditions:

1) Within 30 days of the date of this Order, CPC International, Inc. shall apply to the Illinois Environmental Protection Agency for a revision of

its operating permit for its Bedford Park facility's boilers consistent with this Opinion and Order.

2) The Illinois Environmental Protection Agency shall impose as a condition to a permit to operate that the measurement method for compliance shall be that contained in 35 Ill. Adm. Code 214.101(c).

IT IS SO ORDERED.

Board Members B. Forcade and J. Marlin abstained.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 18th day of November 1983, by a vote of 5-0.

Christan L. Moffett, Clerk
Illinois Pollution Control Board