

ILLINOIS POLLUTION CONTROL BOARD
January 24, 1985

ANDERSON CLAYTON FOODS,)
)
 Petitioner,)
)
 v.) PCB 84-147
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

MS. PERCY L. ANGELO, MAYER, BROWN & PLATT, APPEARED FOR PETITIONER;
MS. BOBELLA GLATZ, ATTORNEY-AT-LAW, APPEARED FOR RESPONDENT.

OPINION AND ORDER OF THE BOARD (by B. Forcade):

This matter comes before the Board on a September 9, 1984, petition for variance from 35 Ill. Adm. Code 216.121, filed by Anderson Clayton Foods ("ACF"). Section 216.121 provides a 200 part per million (ppm) limitation for carbon monoxide (CO) emissions from fuel combustion emission sources. ACF requests a five-year variance in order to retrofit an existing oil/gas boiler with a coal-fired fluidized bed combustor at their Jacksonville food processing plant. The Illinois Environmental Protection Agency ("Agency") filed a recommendation in support of granting variance, subject to conditions, on November 20, 1984. Hearing was held in Jacksonville on November 30, 1984. No public comments were received.

A briefing schedule was established by the hearing officer at the close of hearing. ACF and the Agency were to submit final briefs on January 2, 1985. ACF filed their brief in a timely manner. The Agency filed their brief on January 8, 1985. ACF did not object to this late filing but requested, in their original brief, that they have the opportunity to submit a supplemental or reply brief. The Board took no action on this request and on January 17, 1985, ACF filed a supplemental brief. On January 24, 1985, the date of decision, the Agency filed a motion to strike ACF's supplemental brief or in the alternative, accept responsive arguments contained in its motion. The Board denies the Agency's motion to strike, but will accept the argumentation contained in the motion for the record. The Board notes, however, that briefs are not a right in practice before the Board.

ACF owns and operates a food processing plant located on East Morton Road in Jacksonville, Morgan County, at the junction of U.S. Highways 36 and 104. ACF produces oil based food products at its Jacksonville plant, including vegetable oils, margarine and shortening. The prime raw material is soybean oil which is obtained regionally (R. 14).

The plant operates continuously throughout the year, producing 1.5 million pounds per day of finished oil products and employs 400 people (R. 14). The plant is located on 92 acres, 35 of which are farmed. The plant property is bordered on the north and east by fields, on the southwest by a golf course, on the southeast by fields and on the west by a residential area (R. 15-17). Jacksonville has a population of 20,000. The nearest air monitoring station is in Springfield, approximately 30 miles east of ACF.

Processing fats and oils is an energy intensive activity. ACF operates two 65,000 pound per hour gas/oil fired steam boilers, burning approximately 650,000 mmBtu of fuel to generate 473,600,000 pounds of steam per year, which is used for heat and process purposes (R. 17-18). ACF is planning to retrofit one of the present boilers with a Wormser fluidized bed combustor (FBC). The retrofitted boiler will burn 23,000 tons of less expensive, high sulfur Illinois coal, which will result in a substantial savings in fuel costs. The FBC will also use 6,300 tons of Illinois limestone in the combustion process (R. 22-23). ACF has applied for a grant from the Illinois Coal Bond Fund Program to partially fund the retrofit. ACF applied to the Agency for a construction permits for the retrofit. The Agency issued a Notice of Incompleteness on April 16, 1984, because the application did not include sufficient information, specifically regarding CO emissions and the necessity of a variance. Consequently, this proceeding was initiated (R. 24-25).

The Wormser FBC is a unique system that effectively reduces sulfur dioxide (SO_2) emissions from high sulfur coal combustion and is compact enough to allow the retrofitting of small and medium sized conventional boilers (R. 22-23). The Wormser FBC uses a dual bed design, one for combustion and one for desulfurization, allowing each bed to operate at its optimum temperature. As coal burns in the lower bed, the SO_2 that is formed rises into the upper bed of crushed limestone, where it is absorbed to form calcium sulfate. Over 90% of the SO_2 produced is expected to be controlled by the fluidized bed process (R. 41-45).

The converted boiler is expected to emit increased particulates, SO_2 , nitrogen oxides (NO_x) and CO. The Wormser FBC is expected to produce SO_2 emissions of 1.2 pounds per million BTU (R. 45). However, this level is below the 1.8 pound per million BTU limitation of §214.122(a). ACF plans to install a baghouse to control particulate emissions to less than the 0.1 pounds per million BTU limitation of §212.204. The Wormser FBC is expected to emit 0.4 pounds per million BTU of NO_x , however, there are no Board regulations limiting NO_x for boilers with less than 250 million BTU per hour heat input. NO_x emissions would be greater than from the current gas-fired boiler but less than conventional coalfired technology. CO emissions are expected to exceed the 200 ppm limitation of §216.121.

ACF estimates that CO emissions will be no higher than 400 ppm (R. 47-48). The Agency, however, utilizing manufacturer's

test burn data from a similar fluidized bed boiler retrofit, estimates that emissions could be higher (Rec. p. 3). ACF asserts that given the present state of technology, control of CO emissions from fluidized bed boilers to the 200 ppm level required by §216.121 may not be possible. At this point, it is clear that control of CO emissions from FBC's has not been adequately studied. FBC technology is new and many states that have experience with FBC's, such as Texas, do not regulate CO (R. 45). The Board's CO limitation, which dates from 1972, was adopted years before FBC technology was developed. The Wormser FBC system was patented in 1979 and 1981 (R. 44).

The Petitioner contracted with ETA Engineering, Inc. ("ETA") to make a comprehensive analysis of the environmental effects of granting a variance. ETA prepared an air quality modeling analysis, using U.S. Environmental Protection Agency issued and approved models. ETA also worked closely with the Agency to ensure the acceptability of their methodology (R. 52). The ETA report was submitted at hearing as Exhibit 2. The report states, and the Agency concurs, that the CO levels that would result in the ambient air would be exceedingly low (Pet. Ex. 2, p.12, Rec. p. 3-4). The 1-hour impacts are about 3% and 8-hour impacts are about 7% of the significance levels used in prior years. The impacts of CO concentration, as stated in terms of the highest second high CO concentrations are as follows:

<u>Pollutant</u>	<u>Averaging Time</u>	<u>Maximum of 1973-77 (mg/m³)</u>	<u>NAAQS</u>	<u>% of NAAQS</u>
CO	1-hour	66.8	40,000	0.2
	8-hour	35.3	10,000	0.4

Jacksonville is located in an attainment area for all five National Ambient Air Quality Standard (NAAQS) pollutants (Pet. p. 5). Data from the Springfield air quality monitor is compared in the following table to the CO NAAQS:

<u>Averaging Time</u>	<u>Maximum Impact 1973-77 (mg/m³)</u>	<u>Background (mg/m³)</u>	<u>NAAQS</u>	<u>% of NAAQS</u>
1-hour	66.8	13,455	40,000	34
8-hour	35.3	8,970	10,000	90

(Rec. p. 4).

High concentrations of CO in humans can produce well known toxic effects such as asphyxiation. Lower levels can aggravate cardiovascular diseases and decrease human performance. The level of carboxyhemoglobin, or CO bound hemoglobins, in the human system is directly related to the CO concentrations in the inhaled air (Rec. p. 5). However, the adverse environmental impact of granting variance is minimal. The increase in the ambient air concentration is less than half a per cent. Air quality impacts are well below significance levels (R. 53-54). Human health would not be impacted by granting variance.

The retrofit of the conventional oil-gas boiler with the Wormser FBC will reduce ACF's annual fuel costs from \$2,349,054 to \$790,918, achieving annual savings of \$1,558,142. The retrofit will cost \$5 million, of which \$1 million has been requested from the Illinois Coal Bond Fund (R. 27). ACF will spend approximately \$800,000 on outside construction labor. Illinois coal and limestone will be purchased for approximately \$828,000 per year (Pet. p. 5-6). Utilizing an Illinois Department of Energy and Natural Resources ("DENR") multiplier of 2.0 for calculating secondary benefits on the Illinois economy from coal mine income, ACF's purchase of Illinois coal is expected to yield more than \$1.6 million in additional revenues for Illinois businesses each year (Pet. p. 6-7). Clearly, the retrofit of the ACF boiler with an innovative FBC system will provide numerous economic benefits for ACF as well as for Illinois. The impact on ambient air quality would be minimal as would the health effects. In these circumstances it would impose an arbitrary and unreasonable hardship to deny the variance.

Petitioner ACF has not submitted a firm plan for ultimate compliance with the 200 ppm CO limitation. The parties were directed, by Board order dated September 20, 1984, to discuss "what method of compliance or regulatory change will result in attaining the applicable standard at the end of the requested five year variance." The Agency has responded that present technology of FBC's does not at this time permit compliance with the 200 ppm limitation. The Agency further asserts that insufficient data is available at present, due to the experimental nature of the technology, to formulate a regulation that would provide for minimum achievable CO emission levels with FBC's or a method and schedule of compliance. The Agency will, in the near future, receive emission data from FBC installations in Illinois. These FBC's are currently under construction or in a pre-operational phase. They will be better able to recommend methods of compliance or, in the alternative, regulatory changes that may be necessary to accommodate this new technology (Rec. p. 5-6).

While the Board is hesitant to grant variances without concrete plans for compliance, the circumstances presented in this case prompt some flexibility regarding this requirement. More information needs to be developed concerning CO control from FBC's in general and the Wormser FBC in particular, yet the information cannot be developed until the FBC's are operational. In B.F. Goodrich Co. v. IEPA, PCB 82-88, 49 PCB 223, (October 27, 1982), the Board granted a five year variance for a circulating FBC unit, but required B.F. Goodrich to submit a report to the Agency two years after completion of construction regarding minimization of CO emissions and optimizing combustion efficiency. Additionally, B.F. Goodrich must recommend a CO emission limitation which represents best available control technology for circulating FBC units within two years of completion. The Board granted a CO variance for three years for an FBC installation in Midwest Solvents v. IEPA, PCB 84-19, June 14, 1984. The Board imposed a program of study and a periodic reporting requirement

as conditions to the variance. The Board will, in the instant case, grant ACF a three year variance and impose as a condition of variance that ACF develop and implement a program to study and evaluate any technical advances in the control of CO in FBC boilers. ACF will also be required to develop and evaluate the operating characteristics of their Wormser FBC boiler and must submit written reports every six months outlining the progress of these programs. It should also be noted that ACF has also agreed to provide the DENR with data from the project for future analysis of economic and environmental impacts of the Wormser FBC (Pet. p. 4).

The Agency, in their recommendation, proposes a condition that would require ACF to "immediately implement any technical advances in the control of CO in fluidized bed combustion boilers" (Rec. p. 6). ACF has strongly resisted application of such a condition at hearing and in their written brief (R. 29, Petitioner's Brief p. 8-11). ACF argues that such a mandatory requirement presents both potential economic and environmental risks. CO control techniques could be developed that would be extremely expensive to implement. Thermal efficiency could drop through implementation of CO controls (R. 33, 36). Additionally, there is a trade-off in the combustion process between CO emissions and creation of NO_x (R. 36, 45). Such a mandatory condition requiring immediate implementation of CO control techniques may not result in an overall environmental benefit. The Board shall not impose such a condition in this variance. More information needs to be developed. The Board believes that CO emissions will be adequately controlled at the 400 ppm level, with no real risk to air quality or human health, during the term of the variance. The information developed during the variance will enable ACF, the Agency and the Board to impose reasonable and effective control plans in the future or promulgate more appropriate regulatory CO emission limitations. The Board notes, however, that under 35 Ill. Adm. Code 103.241 Board orders are modifiable for up to one year based on the existence of new facts not previously before the Board.

This Opinion constitutes the Board's findings of fact and conclusions of law in this matter.

ORDER

Anderson Clayton Foods ("ACF") is hereby granted a variance from 35 Ill. Adm. Code 216.121 for its Jacksonville food processing plant, as it applies to the boiler that will be retrofitted with a Wormser fluidized bed combustor, until January 24, 1988. The variance is granted subject to the following conditions:

1. That CO emissions during the period of the variance be kept to a level below 400 parts per million.

- 2. That Anderson Clayton Foods be required to develop and implement a program to study and evaluate any technical advances in the control of CO in fluidized bed combustion boilers.
- 3. That Anderson Clayton Foods be required to develop and evaluate the operating characteristics of their Wormser fluidized bed combustion boiler.
- 4. That Anderson Clayton Foods be required to submit to the Agency every six months, a written report describing the progress of the programs required by conditions 3, 4 and 5 to the following address:

Control Program Coordinator
 Illinois Environmental Protection Agency
 2200 Churchill Road
 Springfield, Illinois 62706

- 5. Within 45 days of the date of this Order, Anderson Clayton Foods shall execute a Certificate of Acceptance and Agreement to be bound to all terms and conditions of this variance. Said Certification shall be submitted to the Agency at 2200 Churchill Road, Springfield, Illinois 62706. The 45-day period shall be held in abeyance during any period that this matter is being appealed. The form of said Certification shall be as follows:

CERTIFICATION

I, (We) _____, hereby accept and agree to be bound by all terms and conditions of the Order of the Pollution Control Board in PCB 84-147, January 24, 1985.

 Petitioner

 Authorized Agent

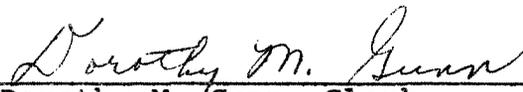
 Title

 Date

IT IS SO ORDERED.

Board Member J. Theodore Meyer dissented and Board Member J. Anderson concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 24th day of January, 1985 by a vote of 4-1.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board