ILLINOIS POLLUTION CONTROL BOARD
January 31, 1974

E.I. DUPONT de NEMOURS AND COMPANY	)	
v.	)	PCB 73-411
ENVIRONMENTAL PROTECTION AGENCY	)	

MR. JAMES C. HILDREW, appeared on behalf of E.I. DuPont
MR. MICHAEL C. BENEDETTO, ASSISTANT ATTORNEY GENERAL, appeared on behalf of the Environmental Protection Agency

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

This case concerns a Petition of Appeal filed under Section 40 of the Environmental Protection Act by E.I. duPont de Nemours and Company (duPont). The Appeal concerns the denial of an operating permit to duPont by the Illinois Environmental Protection Agency (Agency).

On November 20, 1972 duPont applied to the Agency for an operating permit for duPont's ammonium nitrate prill plant located in Grundy County near Seneca, Illinois (petitioner's exhibit 2). Following a period of correspondence between duPont and the Agency on the acceptability of the permit application, (pet. ex. 3, 4, 5) the Agency on June 6, 1973 denied the operating permit application (pet ex. 6). Subsequently duPont on September 20, 1973 filed a Petition of Appeal to the Board on the Agencies permit denial (pet. ex. 8). Public hearings on this matter were held November 27 and 28, 1973 in Morris, Illinois with final arguments from both parties due January 15, 1974.

The Agency denied the permit because in their opinion the Prilling Tower, a portion of the plant, was not shown to be in compliance with the Air Regulations (pet. ex. 6). DuPont's permit application, using duPont's calculations, did show compliance with the Air Regulations. The issue, therefore, is whether or not the Prilling Tower is in compliance because if it is, as duPont alleges, then the Agency acted improperly in denying the permit application on that basis, and the permit appeal should be granted. If the tower is not in compliance, as the Agency alleges, then the appeal should be denied.

The rule to be complied with was itself a subject of contention; with the Agency contending that the old particulate emission rule, Rule 3-3.111, is still in effect and duPont contending that the new particulate emission rule, Rule 203(b) is operative. Both rules relate the allowable particulate emissions to the size of the process, defined in terms of the process weight rate, with larger processes allowed to emit greater amounts of particulates.

DuPont used an erroneously high process weight rate, in the Agency's opinion, in showing compliance with the particulate emissions limitation. They did this the Agency contends by including the cooling and drying air flowing through the process. The Agency maintains that this air, which constitutes 93% of the total process weight rate, should not be included. DuPont calculated a maximum process weight rate of 1,599,000 lb./hr, including 1,494,000 lb./hr. of process air for cooling and drying, 67,000 lb./hr. of ammonium nitrate prills, and 38,000 lb./hr. water vapor which is evaporated in the process (pet. ex. 2, page 9). The allowable emissions according to duPont would therefore be 75 lb./hr. (actually 74.7 lb./hr.) (Petition of Appeal). Based on stack tests at the plant, duPont estimates maximum particulate emissions of 73 lb./hr. from the plant (Pet. Ex. 2)(69 lb./hr. according to the Petition of Appeal). The Agency says that the process weight rate should exclude the cooling and drying air and is therefore only 105,000 lb./hr. The allowable emissions would then, according to either Rule 3-3.111 or Rule 203(b), be only 45 lb./hr. and thus the plant is not in compliance.

The overall process for manufacturing ammonium nitrate (AN) prills involves the following steps: 1) anhydrous ammonia and nitric acid are combined to form an AN solution, 2) water is evaporated to concentrate the AN solution to 96-97%, 3) droplets of solution, formed by spray heads at the top of the prill tower, fall through the tower, cooling and solidifying into pellets or prills as they fall through a countercurrent flow of air, 4) the prills are then further dried and cooled and finally 5) coated with clay (R. 32-37, 43-45).

The bulk of the process air used and particulates emitted originate in the prill tower, so that the hearing was concerned primarily with this portion of the process. The AN solution enters the spray nozzles at the top of the prill tower at about 155°C and the droplets being to solidify in the tower when they cool at 137°C; at which point they could be considered prills (R. 36-37). They further cool and dry during falling so that at the tower exit the prills have a temperature of 70°C and a water content of 2 to 2.5% (R. 43).

Much testimony concerned the characteristics of prilled AN. The prills produced by duPont are used in industrial applications, mainly in explosives manufacturing, and are required to have a lower density and higher porosity then AN prills used in agriculture. The prills are also required to have a high resistance to breakup (R. 45-47).

There are several areas in the process where the prill characteristics are controlled: the concentration and temperature of the AN solution leaving the evaporator, the temperature of the prill as it leaves the prill tower, and temperature and moisture removal rate in the pre-dryer, dryer and cooler (R. 50). In each case air is used to dry and/or cool the AN solution or prills and on the operating permit application duPont included the total air used in these units, excluding erroneously the evaporator, as part of the process weight rate (R. 244). It seems, however, that the main control point is the prill temperature at the tower exit. The desired prill temperature at this point is 60^{o}-70^{o}C with lower temperatures resulting in the operator decreasing the airflow and a higher temperature resulting in the operator increasing the airflow in the prill tower. It has been found that higher temperatures mean a softer pellet will be produced and at lower temperatures a harder pellet (R. 57).

The amount of air flow in the prill tower is controlled by a series of fans and louvers. There are eight fans at the top of the tower which operate in various combinations to pull air up through the tower; in addition there are air inlet louvers at the bottom of the tower and louvers in front of the exhaust fans to help control the airflow (R. 51, 162). The total rated capacity of the 8 fans is 240,000 cfm or about 1,150,000 lb./hr. (R. 76), with denser air in winter resulting in higher mass flows than occurs in summer.

DuPont says that the production rate of prills is largely controlled by the available airflow in the prill tower (R. 66); but it is really the available cooling capacity in the tower that is important. The maximum prill production rate experienced is approximately 725 tons per day and can be reached "anytime that the temperature (ambient) gets down to 30^{o}F or below" (R. 78) and with anywhere from six and a half to seven and a half fans operating. On the other hand when the ambient temperature is around 75^{o} to 80^{o}F, the production rate begin to be limited even with all eight fans operating (R. 71).

The Agency played down the uniqueness of the air used in the prill tower. Mr. Mellott of duPont stated that the prill tower could not be operated in a vacuum but that it was possible that another gas such as nitrogen could be used (R. 107-108).

It was also learned that during the period from 1968 to 1972, the production rate of prills was increased without increasing the maximum capacity of airflow (R. 265).

The Board finds, based on the above process information, that the air used in the prill chamber serves to cool the AN liquid into solid prills, and controls to some extent the characteristics of the prills produced. This air is important to the process in the same way that heated air is important to the drying process such as in a grain or sand dryer. In cases before the Board involving emissions from dryers such as these, e.g. PCB 72-215, EPA v. Weldon Grain Co-op, and PCB 72-392 EPA v. Aurora Metals, Faskure Division, air used in the dryers was not included in the process weight calculation; and we do not believe that air used in the prill plant in the instant case should be included in the process weight rate either.

DuPont's position on the inclusion of the cooling and drying air is based on the definition of process weight. The difference between the definitions in the old and new regulations is shown below.

1) Rules and Regulations Governing the Control of Air Pollution (old regulations) Section 1

Process Weight - The total weight of all materials introduced into any source operation. Solid fuels charged will be considered as part of the process weight but liquid and gaseous fuels and combustion air will not.

Process Weight Rate - (a) For continuous or long-run steady state source operations, the total process weight for the entire period of continuous operation or for a typical portion thereof, divided by the number of hours of such period or portion thereof. (b) for a cyclical or batch source operation, the total process weight for a period that covers a complete operation or an integral number of cycles, divided by the hours of actual process operation during such a period. Where the nature of any process or operation or the design of any equipment is such as to permit more than one interpretation of this definition, the interpretation that results in the minimum value for allowable emission shall apply.

2) Air Pollution Regulations (new regulations) Rule 201

Process Weight Rate: The actual weight or engineering approximation thereof of all materials except liquid and gaseous fuels and combustion air, introduced into any

> process per hour. For a cyclical or batch operation, the process weight rate shall be determined by dividing such actual weight or engineering approximation thereof by the number of hours of operation excluding any time during which the equipment is idle. For continuous processes, the process weight rate shall be determined by dividing such actual weight or engineering approximation thereof by the number of hours in one complete operation, excluding any time during which the equipment is idle.

The Agency argues that the old regulations are still in effect (R. 125-126) so that the old definition of process weight rate, especially the last sentence of the definition, could be used to exclude the air from the process weight rate. DuPont maintains that the definition section of the new air regulations became effective April, 1972 (R. 126), and that the new definition of process weight rate does not include room for interpretation. They also reference the Opinion in PCB 73-71 Johnson and Johnson (Pet. Ex. 1) as indicating that the Board interprets the definition of process weight rate to include all materials except those specifically excluded i.e. everything is included except liquid and gaseous fuels and combustion air. The Agency responded by referencing the June 28, 1973 Order of the Board in this Johnson and Johnson case (Pet. Ex. 1) which says that the Board interpretation applies only to the special circumstances at Johnson and Johnson. It is the Board's opinion that the definitions do not stand alone but exist in terms of their use in particular rules. Therefore since for existing sources the compliance date for particulate emissions is December 31, 1973; we find that prior to that time duPont is regulated by the emission limits and definitions contained in the old Rules and Regulations Governing the Control of Air Pollution. The Agency points this out in the following excerpt from the letter of denial to duPont (Pet. Ex. 6).

> The particulate emissions from the process described in the above-referenced operating permit application are covered by the particulate emission standards and limitations contained in Chapter 2 of the Regulations of the Illinois Pollution Control Board and in the Rules and Regulations Governing the Control of Air Pollution until superseded by the provisions of Chapter 2.
>
> In your operating permit application, you have not shown that the following significant emission sources are in compliance with presently applicable standards:
>
> Prilling Tower

The Agency chose to use this case as the forum to respond to the Board's request for information on process weight rate in the July 19, 1973 Opinion in PCB 73-71 Johnson and Johnson (Pet. Ex. 1). Therefore, one of the exhibits entered into the record is the Bay Area Air Pollution Control District Regulation 2 (EPA Ex. 4) for the purpose of historical background. Not much insight is provided by this document, however, since the definitions of process weight and process weight rate are identical to those in our Rules and Regulations. The Agency contention is that in establishing the new process weight tables in Rule 203, non-reacting air was not included (R. 294). The process rate tables were designed to result in meeting the federal ambient air quality standards and did not include the weight of air (R. 327). If non-reacting air had been included in establishing the tables, a more stringent regulation would have resulted (R. 328). That air should not be included seems recognized by almost all industries since less than 1% of the applications for operating permits include process air as part of the process weight rate (R. 387). In addition, the Agency in determining the technical feasibility of the then proposed process weight tables did not include air (R. 310).

After considering the record in this case, we find that process air should not be included in the calculation of process weight rate; therefore, duPont's emissions exceed the standards, the permit was denied properly, and the Board hereby denies duPont's appeal. The Board also finds that in using the process weight rate tables of Rule 203 of the Air Pollution Regulations, the definition of process weight rate shall be interpreted as never including the weight of non-reactive air such as that used for drying and cooling.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

IT IS THE ORDER of the Board that duPont's Petition of Appeal is denied.

IT IS SO ORDERED.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 31st day of January, 1974 by a vote of 5-0.

Christan L. Moffett

Christan L. Moffett, Clerk
Illinois Pollution Control Board