

ILLINOIS POLLUTION CONTROL BOARD  
September 21, 1978

IN THE MATTER OF: )

PROPOSED DETERMINATION OF )  
NO SIGNIFICANT ECOLOGICAL )  
DAMAGE FOR THE ZION AND WAUKEGAN )  
GENERATING STATIONS )

PCB 78-72, -73  
Consolidated

ROBERT H. WHEELER, ISHAM, LINCOLN AND BEALE, APPEARED ON BEHALF  
OF PETITIONER;  
RUSSELL R. EGGERT, ASSISTANT ATTORNEY GENERAL, APPEARED ON BEHALF  
OF THE AGENCY.

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

These petitions come before the Board for a determination, as required by Rule 203(i)(5) of Chapter 3: Water Regulations, that thermal discharges from Commonwealth Edison's (Edison's) Waukegan and Zion Generating Stations have not caused and cannot be reasonably expected to cause significant ecological damage to the receiving waters of Lake Michigan. Edison filed petitions for each station on March 14, 1978, and pursuant to Procedural Rule 604(d)(4), Edison requested that the record from PCB 77-82, an earlier 410(c) determination decided August 3, 1978, involving the same two stations, be incorporated into the records of the 203(i)(5) determinations. The Board, on its own motion, hereby consolidates these 203(i)(5) proceedings, since experts testifying in PCB 77-82 often made general statements about ecological effects from thermal discharges without making specific references to either station. Mandatory hearings were held, and John R. Hughes, Edison's Director of Water Quality, was the only witness to testify at either proceeding. Mr. Hughes testified that no significant ecological damage occurred to Lake Michigan as a result of the operations of the Waukegan and Zion stations since the close of the record in PCB 77-82 (R. 5 of PCB 78-72 and R. 5 of PCB 78-73).

The Waukegan Generating Station has eight (8) fossil (coal) fired steam generating units, five of which have been retired. Unit 5 was just retired in February of 1978, subsequent to hearings in PCB 77-82. Cooling water is withdrawn from Lake Michigan and flows through the condensers at a rate of  $0.758 \times 10^6$  gpm, resulting in a temperature rise of approximately 13°F. Occasionally, the 3°F isotherm of the Waukegan plume exceeds 72 acres, but it is impossible to delineate the extent of this occurrence because: a) there is no dependable way of determining ambient temperatures; and, b) it is difficult to identify temperature contour distribution between measured sampling points. The predicted area of the plume is 126 acres for the 3°F isotherm with no cross-current in the lake for the discharge structure. A cross-current of 0.35 ft. sec. yields

a calculated area of 867 acres. Both calculations are based on the full operation of four (4) units, not three (3).

The Zion Generating Station consists of two 1,100 MWe (gross) nuclear generating units. Lake water is used for condenser cooling at a rate of 1945 cfs per unit when the station is operating at full capacity, resulting in a mean temperature rise of approximately 18.2°F. Actual and theoretical plume studies, conducted by Hydrocon, Inc., indicate that the 3°F plume ranged from 0.8 acres for summer (best case) to 583 acres for spring - fall (worst case). Lake currents parallel with the shore rapidly bend the plume either north or south.

Expert opinions, relied upon in PCB 77-82 and based on data compiled by Hydrocon, Inc. and Nalco Environmental Sciences, indicated that virtually no damage was being done to the Lake Michigan environment as a result of heated discharges from the Zion and Waukegan stations. While some changes in the Lake Michigan biota were noted, these changes were attributed to factors other than heated discharges. See, Proposed Determination of Thermal Standards for Zion and Waukegan Generating Stations, PCB 77-82; August 3, 1978. The Board considered the evidence presented by Edison in PCB 77-82 to be persuasive and found that environmental damage to Lake Michigan was minimal.

Upon review of the evidence submitted in PCB 77-82 and the proceedings before us now, the Board finds that Edison has provided the information required by Procedural Rule 602. The Board notes that the Agency did not file a Recommendation in either proceeding, but did not contest Edison's showing of no significant ecological damage. It is the Opinion of the Board that Edison's Waukegan and Zion Generating Stations have not caused and cannot be reasonably expected to cause significant ecological damage to receiving waters. Edison has, therefore, satisfied the requirements of Rule 203(i)(5) of Chapter 3 of the Board's Regulations.

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

Order

It is the Order of the Pollution Control Board that the Petitioner has complied with Rule 203(i)(5) of Chapter 3 of the Board's Regulations by demonstrating that its thermal discharges from the Waukegan and Zion Generating Stations have not caused and cannot be reasonably expected to cause significant ecological damage to receiving waters.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 21<sup>st</sup> day of September, 1978 by a vote of 4-0.

Christan L. Moffett  
Christan L. Moffett, Clerk  
Illinois Pollution Control Board