

ILLINOIS POLLUTION CONTROL BOARD
June 22, 1979

IN THE MATTER OF:)
)
PROPOSED DETERMINATION OF) PCB 78-98
NO SIGNIFICANT ECOLOGICAL)
DAMAGE FOR THE DRESDEN)
GENERATING STATION)

MR. ROBERT H. WHEELER; ISHAM, LINCOLN, & BEALE; appeared on behalf of Commonwealth Edison.
MR. RUSSELL EGGERT, ASSISTANT ATTORNEY GENERAL, appeared on behalf of the Agency.

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

On April 4, 1978 Commonwealth Edison Company (Edison) filed a Petition pursuant to Rule 203(i)(5) of Chapter 3: Water Pollution. Edison is asking the Board to determine that thermal discharges from the Dresden Generating Station (Dresden) have not caused and cannot be reasonably expected to cause significant ecological damage. At a hearing on August 15, 1978 at the Board's Chicago office, the Agency indicated that it did not oppose Edison's request. On November 16, 1978 the Board remanded this matter for additional information. On May 15, 1979 Edison filed a supplemental report. This proceeding is governed by Part VI of the Board's Procedural Rules.

Dresden is a three unit, nuclear powered, steam electric generating plant with a capacity of 1795 megawatts (MW) net. The plant is located eight miles east of Morris, Illinois in Grundy County at the confluence of the Kankakee, Des Plaines, and Illinois Rivers.

Unit I began operation in 1960 and has always employed an open cycle, once through condenser cooling water system. This unit withdraws 426 cubic feet per second (cfs) of water from the Kankakee and Des Plaines Rivers, raises the water temperature 16.6°F at full load, and discharges into the Illinois River one mile downstream of the intake.

Units 2 and 3 began operation in 1970 and 1971 respectively and use a closed cycle, spray canal/cooling pond system for cooling. During the months of October-April this system discharges only 111 cfs to the Illinois River and withdraws 156 cfs from the Kankakee and Des Plaines River. The difference (45 cfs) results from evaporation and seepage from the spray canal/cooling pond system. The closed system raises the cooling water 21.4°F at full load. This water is discharged through a two mile canal using 68 spray modules, pumped into

a 1275 acre cooling pond and circulated for 2.8 days, discharged into another two mile canal using 30 spray modules, and then recirculated through the condensers. From May-September the discharge to the Illinois River ranges from 111-1115 cfs to avoid severe megawatt deratings from high water temperatures and excursions above the Board's thermal water quality standards.

During 1972-1976 the capacity for the entire plant ranged from 41.5-72.2% with an average of 54.8%. No 1977 data were presented. Future capacity is expected to lie in the 60-65% range. Unit 1 will probably be retired in 1995, unit 2 in 2005, and unit 3 in 2006. No additional units are planned at the present time. Shutdowns have ranged from a few minutes to several months with at least one unit running at all times from 1972-1976. Forced outages are expected 10% of the time for 1978-1982 with an additional 10-15% for scheduled unit refueling maintenance overhauls.

The temperature of the discharge from the Unit 1 open cycle system has ranged from 32.7°F to 100.1° from August, 1972 to November, 1977. The discharge from Units 2 and 3 has ranged from 43.7-93.3°F for the same period.

Forty-nine actual plume studies have been conducted on the combined effect of both discharges with approximately one half of these studies done during the warm summer months. Seven studies were conducted when the Illinois River flow was less than the 7 day, 10 year low flow. Calculated plume size has ranged from 0-24.6 acres, all within the limitation of 26 acres in Rule 201(a) of Chapter 3. These plumes have covered less than 10% of the width of the Illinois River on an average. A maximum zone of passage is said to exist because of the tendency of these plumes to occupy thin upper layers.

Edison has not been able to find any mathematical model which can adequately predict typical and worst case conditions or which identifies isotherms at 3°F down to ambient temperatures for this physical configuration. Edison feels that the complex physical conditions existing in the vicinity of its discharges make all existing models inapplicable. Specifically, the different velocities and temperatures of the Des Plaines and Kankakee rivers, the fact that the Des Plaines is almost isothermal while the Kankakee exhibits marked stratification, and additional complications such as barge traffic result in calculated plume sizes which are smaller than the actual recorded plumes.

Edison has collected extensive biological data from 1969-1976 on the quality of the receiving streams both upstream and downstream. Water quality was somewhat improved as a result of Edison's operations. The benthic community near the discharge points was affected more by factors other

than thermal additions. Phytoplankton and zooplankton do not appear to be affected at all while effects on the periphytic algal community were localized around the immediate discharge area. Similarly there were no observable adverse effects on fish populations.

Edison feels that the riparian habitat in the area is the primary factor controlling populations of wildfowl and amphibians. Edison points to a greater diversity of ducks and geese in the cooling lake than the Illinois River. Since there is a greater temperature rise in the lake, Edison feels that no adverse effects on wildfowl would be observable in the Illinois River. None of Edison's sampling has revealed any impact on amphibians in the vicinity of the discharge.

Edison points to an increase in recreational boating, a possible beneficial impact on fish populations, and a lack of any adverse data to support its conclusion that the thermal discharge from Dresden has not interfered with recreation.

While Edison's data has not completely conformed with the letter of Part VI of the Procedural Rules, it has shown that thermal discharges from Dresden have not caused and cannot be reasonably expected to cause significant ecological damage to the receiving waters. This conclusion is supported primarily by Edison's evidence which shows that it has complied with present standards through actual data. The fact that wildfowl seem to prefer the cooling lake to the river is probably attributable to the habitat of the cooling lake and not to any thermal component. The lack of theoretical data required by Procedural Rules 602(c)(2) and (3) will have to be cured when Edison requests alternative thermal effluent limitations under Rule 410(c) of Chapter 3: Water Pollution and Section 316 of the Clean Water Act as it has said it would.

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 Commonwealth Edison Company has not caused and cannot be reasonably expected to cause significant ecological damage to the Illinois River from the thermal discharge from the Dresden Generating Station.

Mr. Goodman abstains.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 22ND day of June, 1979 by a vote of 4-0.

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