ILLINOIS POLLUTION CONTROL BOARD
August 15, 1972

CITY OF PARIS	)	
v.	)	PCB 72-277
ENVIRONMENTAL PROTECTION AGENCY	)	
CITY OF OAKLAND	)	
v.	)	PCB 72-289
ENVIRONMENTAL PROTECTION AGENCY	)	

OPINION OF THE BOARD (by Mr. Dumelle)

These two variance applications request the use of copper sulfate in their respective drinking water reservoirs to prevent algae nuisances and ask that permission to exceed the 0.02 mg/l copper standard in the water quality regulations be granted.

We grant these variances for the reasons noted but recommend further study of alternatives before next year's algae season.

CITY OF PARIS

The City of Paris in Edgar County has a population of 9,971. Its variance petition was received by the Board on July 5, 1972. No hearing was held.

The Paris water supply is contained in three reservoirs and totals 840 million gallons according to Mr. L. Leon Foltz acting for the petitioner. Mr. Foltz states that copper sulfate control is necessary to control algae and thus eliminate a bad taste in the water caused by the algae. It is alleged that the practice has gone on for a long time.

The Agency recommends a grant of the variance and states that the practice has gone on since 1942 with no "apparent effects on human or aquatic life." The Agency recommends a treatment of up to 1000 lbs. of copper sulfate twice monthly through October 1972 and states that the copper level will not exceed 0.10 mg/l at maximum dosage.

CITY OF OAKLAND

The City of Oakland in Coles County has a population of 1,012. The variance petition was received by the Board on July 10, 1972. No hearing was held.

The Oakland water reservoir was created by damming a branch of the Embarrass River in 1936 or 1937, has an area of about 26 acres and a capacity of about 25 million gallons (21.68 million gallons according to the Agency) as stated in the petition signed by Mr. Dale E. Francis, engineer for the city.

Copper sulfate has been used for at least 30 years since 1942) according to Mr. Francis, to reduce algae and thus eliminate the taste and odors in the water caused by it and to permit longer filter runs between backwashings. No harm to fish or aquatic life has occurred and the reservoir has good fishing.

The Agency recommendation received by the Board on August 4, 1972 recommends a grant with dosages of copper sulfate not to exceed 300 lbs. per monthly treatment through September and states that at maximum dosage the copper levels should not exceed 0.42 mg/l. The Agency states that the practice has been going on since 1947 (petitioner states 1942) with no "apparent adverse effects on human or aquatic life."

DISCUSSION

Since the Agency recommends the grant and since "no apparent effects" are known we grant the variances in these two cases. We are not convinced that the petitioners or the Agency has adequately explored all possible alternatives to using copper sulfate. Last week in three similar variance grants we listed six alternatives none of which appear to have been considered in these records by the Agency or the petitioners (City of LaHarpe, et al, PCB 72-168, 203, 225; August 8, 1972).

The methods listed last week are (1) activated carbon on the reservoir surface, (2) dosing with lime, (3) use of algae viruses, (4) use of algae toxins, (5) air injection to bring cooler water to the surface, and (6) control of critical nutrients, such as phosphorus. To these we would now add (7) stocking with algae-eating fish, (8) use of parasitic fungus, and (9) use of a substitute algacide.

Two fish species which eat algae have come to our attention. Whether they are suitable for stocking in Illinois reservoirs we do not know but we would encourage Agency research and comment. The two fish species are the viviparous top minnow Gambusia, and the so-called "Chinese algae eater" (it is actually

from Thailand) Gyrinocheilus aymonieri (tirant), a species of sucker catfish.

The article "Potential Algicides for the Control of Algae" by James C. Gratteau in the Reference Number of Water and Sewage Works (1970) mentions the English lakes study of parasitic fungus (p. R-45) and the promising new chemical algicides to replace copper sulfate, namely, 2, 3-dichloronaphthoquinone (for blue-green algae) and Algimycin-P11 (pp. R-30, R-45).

In summary, the Board feels that there may be undesirable effects on the environment occurring from the repeated use of copper sulfate. In future proceedings of this type, the Agency should explore the alternatives listed above as well as any others that seem to be appropriate. The English book, Fish and River Pollution by J. R. E. Jones (1964) states:

> After their examination of all the data Doudoroff and Katz conclude that in most of the natural fresh waters of the U. S. A. copper sulphate concentrations below 0. 025 ppm as Cu are not rapidly fatal for most of the common fish species.(p. 59)

The concentrations granted here are well in excess of 0. 025 mg/l, being 0. 10 mg/l for the City of Paris and 0. 24 mg/l for the City of Oakland. It should also be pointed out that the Agency may have erred in its recommendations for the City of Paris. The petitioner asked to use 1000 lbs. of copper sulfate every two weeks per lake. The water reservoir is referred to as the "Twin Lakes" and later "three reservoirs" are mentioned. Thus it appears that either 2000 lbs. or 3000 lbs. of copper sulfate are required at Paris for each treatment. However, we will enter the variance at the Agency's recommendation of 1000 lbs. per treatment for the entire water supply in storage. If the figure is in error then the parties can supply a request for an amended order.

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

ORDER

Variances are granted to the cities of Paris and Oakland to exceed the water quality standard of 0. 02 mg/l in their water supply reservoirs by treating with copper sulfate to prevent algae blooms subject to the following conditions:

1) Dosage shall be limited as follows:

   a) For Paris, to two treatments per month from August through October, 1972 not to exceed 1000 lbs. of copper sulfate per treatment.

b) For Oakland, to one treatment per month from August through September, 1972 not to exceed 300 lbs. of copper sulfate per treatment.

2) Copper concentrations at the raw water intake to the water treatment plant shall never exceed 1.0 mg/l.

3) Copper concentration in the reservoir shall be measured immediately before and after each copper sulfate treatment and the results submitted to the Agency on a monthly basis.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 15th day of August, 1972 by a vote of 5-0.

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