

ILLINOIS POLLUTION CONTROL BOARD  
April 27, 1978

VILLAGE OF PATOKA, )  
 )  
 Petitioner, )  
 )  
 v. ) PCB 78-7  
 )  
 ENVIRONMENTAL PROTECTION AGENCY, )  
 )  
 Respondent. )

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

This matter comes before the Board on a Petition for Variance filed on January 6, 1978, by the Village of Patoka seeking permanent relief from the Water Pollution Regulations: Chapter 3, Rules 203(c) and 402 (phosphorus) and Rule 404(f) as it applies to biochemical oxygen demand (BOD<sub>5</sub>) and total suspended solids (TSS). The Village of Patoka filed an Amended Petition on February 6, 1978, requesting relief for five years. On March 14, 1978, the Environmental Protection Agency filed its Recommendation in support of the Amended Petition. No hearing was held in this matter.

The Village of Patoka, a small rural community of 580 in Marion County, Illinois, owns and operates a sewage treatment works consisting of a single-cell lagoon with a design capacity of 700 P.E. The effluent from the treatment lagoon is discharged to an unnamed tributary of the North Fork of the Kaskaskia River which flows into Carlyle Lake. The discharge is approximately 8.2 stream miles from Carlyle Lake. Effluent time of travel at 7-day 10-year low flow conditions is estimated at 2.9 days from Petitioner's discharge to point of entry into Carlyle Lake.

The Village of Patoka is presently considering measures for upgrading its wastewater treatment lagoon. Current efforts focus on preparing facilities planning under federal Step I funding. Anticipated improvements involving Step II and Step III grants include a three-cell non-aerated pond system followed by intermittent sand filtration with disinfection and, if necessary, reaeration facilities (Pet. Exh. 1). The proposed treatment lagoon improvements are designed to meet the Board's effluent limitations and water quality standards except those which are the subject of this variance. The Petition at page 4 suggests that these improvements could be completed by May, 1980, assuming, of course, no delays in federal construction grant funding.

Rules 203(c) and 402 (Phosphorus)

Rule 203(c) establishes a standard of 0.05 mg/l for phosphorus as P in any reservoir or lake or in any stream at the point where it enters the reservoir or lake; Rule 402 requires that Petitioner's effluent not contribute to a violation of Rule 203(c) water quality standard. As indicated in Appendix E to the Petition (sheet 5), the phosphorus concentration in the North Fork downstream from Petitioner's discharge exceeds the 0.05 mg/l standard. Therefore, Petitioner's effluent concentration is limited to the water quality standard of 0.05 mg/l phosphorus.

Information from the National Eutrophication Survey (NES) indicates that phosphorus was the rate-limiting nutrient for algae growth in Carlyle Lake in May, 1973, when samples were collected (Pet. p3); however, the Army Corps of Engineers concludes from a limited sediment study that sunlight is the factor regulating organic growth in the lake (Pet. Supp.). According to other NES data, Carlyle Lake while eutrophic is ranked ninth out of 31 Illinois lakes studied in this survey. Figures from the sampling data conclude that non-point sources account for 97% of the phosphorus loading to Carlyle Lake. The contributions of phosphorus from the Patoka treatment facility and the North Fork of the Kaskaskia River are estimated at less than 0.1% and 1.9% respectively (Pet. Exh. 3, p3, 12).

The Village of Patoka claims that compliance with 0.05 mg/l standard would impose an arbitrary and unreasonable hardship (Pet. p3). In support of this position, Petitioner submitted an evaluation of three treatment alternatives including land application, chemical treatment, and diversion to another watershed. The Petitioner alleges and the Agency agrees that use of any of the three alternatives would work an economic hardship upon this community (Pet. p8, Rec. p4).

The Board is familiar with the problems facing municipal dischargers in meeting phosphorus standards. City of Hoopston, PCB 76-234, 24 PCB 441; Southern Illinois University at Edwardsville, PCB 77-111, 25 PCB 775; Valley Water Company, Inc., PCB 77-146, 25 PCB 289.

In those and other cases, the Agency and the Board have recognized that it is economically impractical for the petitioners to comply with the current phosphorus limitation of Chapter 3. In addition, the Agency has petitioned the Board in regulatory proposal R76-1 for appropriate amendments to the phosphorus effluent and water quality standards of the Water Pollution Regulations. If regulatory proposal R76-1 were adopted as proposed, the Village of Patoka would be relieved of the requirement to treat to 0.05 mg/l.

The Board finds that Petitioner would suffer an arbitrary and unreasonable hardship if required to meet the existing 0.05 mg/l standard. Petitioner will be granted a variance from Rule 203(c) and 402 for five years or until the Board adopts a regulation change under R76-1, whichever occurs first subject to the conditions of the Order.

Rule 404(f) (BOD<sub>5</sub>/Total Suspended Solids)

In this Petition, the Village of Patoka also seeks a variance from the 4 mg/l BOD<sub>5</sub> and the 5 mg/l total suspended solids effluent limitation of Rule 404(f). In October, 1976, the Village submitted a formal request for a lagoon exemption which the Agency found inconclusive and denied (Rec. App. C). In support of their request, the Village presented calculations using modified Streeter-Phelps equation in attempt to demonstrate that its discharge would not violate the dissolved oxygen standard in Carlyle Lake. However, application of the Streeter-Phelps equation is limited to free flowing streams and stream travel times in excess of 5 days. In this case, the Agency found that insufficient stream travel time (2.9 days) precluded use of the Streeter-Phelps equation thus requiring the Village to either undertake the extraordinary costs of a modeling study for determining downstream dissolved oxygen conditions or to seek this variance from the Board.

The Agency believes that Petitioner's upgraded facility will not violate the dissolved oxygen standards in Carlyle Lake (Rec. p4) and recommends that Petitioner be granted a variance from the dissolved oxygen requirements of Rule 404(f)(ii)(B) (Rec. 4). The Agency recommendation included a summary of Petitioner's prior submissions to the Agency including Streeter-Phelps calculations indicating that Petitioner's discharge would exert a dissolved oxygen demand of 0.07 mg/l in the stream at the end of a 2.9 day travel, conclusions from Petitioner's study that the discharge dissipates before reaching Carlyle Lake during 7-day 10-year low flow conditions (Rec. App. B), and cost estimates of alternative methods of compliance (Rec. p4).

The Village of Patoka and the Agency have investigated alternative treatment methods as a means for meeting the 4/5 BOD/TSS requirements. Pumping to a different watershed would result in a \$1.04/1000 gallon monthly additional user charge, and land application is estimated at a monthly increase of \$3.49/1000 gallons. In all cases, the Petitioner claims, and the Agency does not dispute, that the cost of compliance with the BOD<sub>5</sub>/TSS standard would impose an unreasonable economic burden for the Patoka community causing an arbitrary and unreasonable hardship (Pet. p3-8; Rec. p4).

In view of the difficulty and expense which would be involved for the Petitioner in this instance to demonstrate compliance with Rule 404(f)(ii)(B); the minimal effect of the discharge on dissolved oxygen levels in Lake Carlyle; and the cost of alternative methods

of disposal, the Board will grant relief from Rule 404(f)(ii)(B) provided that all other requirements of that rule, including effluent concentration limitations of 10 mg/l of BOD<sub>5</sub> and 12 mg/l of suspended solids are met.

The Board will direct the Agency to modify Petitioner's NPDES Permit IL 0028396 consistent with this Order pursuant to Rule 914 of Chapter 3 and to include interim effluent limitations as may be reasonably achieved through application of best practicable operation and maintenance practices in the existing facilities.

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

#### ORDER

1. The Village of Patoka is granted a variance for the operation of its wastewater treatment plant from Rules 203(c) and 402 of Chapter 3: Water Pollution Rules and Regulations regarding phosphorus until April 13, 1983, subject to the following conditions:

- a) This variance will earlier terminate upon adoption by the Board of any modification of the existing phosphorus water quality standards and effluent limitations and the Village shall comply with such revised regulations when adopted by the Board.
- b) Petitioner shall provide space in its design for storage of chemicals, and for mixing and dosing equipment capable of meeting a phosphorus effluent concentration of 1 mg/l, or to whatever alternative level may be established by the Board.
- c) In the event that grant funds become available during the period of this variance, the Village shall incorporate in any design and specification adequate provision for the installation of equipment for the removal of phosphorus which will provide the best practicable treatment technology for the removal of phosphorus over the life of the works.

2. The Village of Patoka is granted a variance from Rule 404(f)(ii)(B) of Chapter 3: Water Pollution Rules and Regulations until April 13, 1983, subject to the following conditions:

- a) Petitioner shall actively pursue construction grant funding to construct facilities as described in Exhibit 1 of the Petition for Variance and this Order or other such facilities which provide an equivalent degree of treatment.
- b) Petitioner shall meet all requirements of Rule 404(f)(ii) of Chapter 3 except those exempted by this Order.

3. Petitioner, within 30 days of the date of this Order, shall request Agency modification of NPDES Permit IL 0028396 to incorporate all conditions of the variance set forth herein.

4. The Agency, pursuant to Rule 914 of Chapter 3, shall modify NPDES Permit IL 0028396 consistent with the conditions set forth in this Order including such interim effluent limitations as may reasonably be achieved through the application of best practicable operation and maintenance practices in the existing facilities.

5. Within forty-five (45) days of the date of this Order, the Petitioner shall submit to the Manager, Variance Section, Division of Water Pollution Control, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois, 62706, an executed Certification of Acceptance and Agreement to be bound to all terms and conditions of the variance. The forty-five day period herein shall be suspended during judicial review of this variance pursuant to Section 31 of the Environmental Protection Act. The form of said certification shall be as follows:

CERTIFICATION

I, (We), \_\_\_\_\_ having read the Order of the Pollution Control Board in PCB 78-7, understand and accept said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

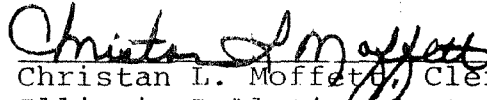
\_\_\_\_\_  
SIGNED

\_\_\_\_\_  
TITLE

\_\_\_\_\_  
DATE

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 27<sup>th</sup> day of April, 1978 by a vote of 5-6.

  
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Christan L. Moffett, Clerk  
Illinois Pollution Control Board