

ILLINOIS POLLUTION CONTROL BOARD  
June 9, 1971

North Shore Sanitary District )  
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 v. ) PCB 71-36  
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 Environmental Protection Agency )  
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Mr. Murray R. Conzelman for the petitioner,  
Mr. Thomas Scheuneman for the respondent

Opinion of the Board (by Jacob D. Dumelle)

On March 4, 1971 the North Shore Sanitary District (District) petitioned the Illinois Pollution Control Board (Board) for a variance to be exempt from the operation of a certain regulation (R 70-6 Phosphorus Water Standards) adopted by the Board on January 6, 1971, amending SWB-7 and dealing with phosphorus as a water contaminant. The regulation is both a water quality and effluent standard as follows:

Water Quality Standard. Existing Board Regulations specifying water quality standards for Lake Michigan, Wolf Lake and the Calumet River (lakeward of the O'Brien Locks) are hereby amended to provide that the concentration of total phosphorus measured on unfiltered samples in these waters shall not exceed 0.02 mg/l as phosphate (PO<sub>4</sub>) or 0.007 mg/l as phosphorus (P).

Effluent Standard. Except for unavoidable combined sewer overflows during the interim period before their complete elimination, no effluent to the waters of Illinois listed in Section 1 above, shall include phosphorus in excess of 3.0 mg/l as phosphate (PO<sub>4</sub>) or 1.0 mg/l as phosphorus (P) after December 31, 1971. Dilution of effluents shall not be acceptable alternatives to treatment. Where water is added to streams of waste water and cannot be reasonably separated, then its quantity shall be measured and effluent concentrations recomputed to exclude its diluting effect.

The District requested that it be granted a variance for six of its seven lakeside plants to be allowed to discharge effluents with excessive phosphorus concentrations beyond the December 31, 1971 deadline. The District requested that the effective date for the effluent standard be extended to December 31, 1972 for all except its Waukegan plant.

The District has provided sewage treatment since 1914 and at present provides treatment for most of Lake County with treatment plants which discharge into Lake Michigan (R.7-8). The largest is the Waukegan Plant for which no variance is sought (R.17). Proceeding southward the plants and their capacities are as follows (R.8,30):

PLANT	TREATMENT PROVIDED	CAPACITY Gallons per day
North Chicago	Secondary (Trickling Filter)	3,500,000
Lake Bluff	Primary	300,000
Lake Forest	Primary	1,000,000
Park Ave. (Highland Park)	Primary	1,000,000
Ravine Drive (Highland Park)	Primary	500,000
Carey Ave. (Highland Park)	Primary	1,000,000

All except the Ravine Drive Plant are both organically and hydraulically overloaded (R.33-34). A witness for the District stated that it expects to divert the effluents from Lake Michigan by the middle of 1973 for all the plants for which the variance was sought (R.38).

Mr. Raymond Anderson, the District's Secretary and General Manager stated that although the District was ready to expand its facilities in 1963 it was prohibited from doing so by the Sanitary Water Board because of the Lake Michigan diversion case then being heard by the U.S. Supreme Court. The District proceeded with its expansion plans immediately upon the conclusion of the case in 1967 (R.9). A \$35,000,000 bond issue was passed upon by the voters in 1968 to allow the District to build new facilities and to improve the existing level of treatment (R.9-11).

Both Mr. Anderson and Mr. Herbert W. Byers, Chief Engineer of the District testified that in their opinion there would be no substantial detrimental effect on Lake Michigan as a result of the District continuing phosphorus inputs into the Lake (R.25-26, 63-64) Countering these opinions are the statements of Dr. Eugene Stoermer in League of Women Voters et al v. North Shore Sanitary District PCB 70-7, 12, 13, 14 (March 3, 1971) and the eloquent testimony of Dr. A.F. Bartsch at the Phosphorus Water Standards rule-making hearing (R 70-6) in which he concluded that, "If you like this Lake the way it is, then you ought to quit insulting it with all this junk you are putting in; and if you keep the level down to the lowest you can maybe you can even turn it back in time." (R 70-6,R.305). The Board has commented on the District's phosphorus discharges in another proceeding. In League of Women Voters et al v. North Shore Sanitary District (supra), the Board said:

"The standard in SWB-7...was that total phosphate shall not exceed 0.03 mg/l on an annual average basis and 0.04 mg/l on a single value or average. 65% of the samples taken exceeded the standard with the highest readings being taken in the area of the Lake used by the District. In fact, samples indicated a total phosphate content of as high as 3.9 mg/l, which is 90 times higher than the standard would allow. The standard has since been tightened by this Board to 0.02 mg/l..."

"It is obvious from the facts recited above that inadequately treated discharges by the District into Lake Michigan, particularly with regard to bacteria, viruses, phosphates, and unsightly floating matter, have created a nuisance and rendered the waters of the Lake injurious to public health and to domestic, recreational, and other legitimate uses, and therefore, that the district has caused and continues to cause water pollution in violation of Section 12(c) of the Environmental Protection Act, as defined by section 3(n). It is equally obvious that these discharges have also caused violations of the numerical standards of Rule and Regulations SWB-7, Rule 1.02, with respect to bacteria, floating solids and debris, total phosphates, ammonia nitrogen, and MBAS." [Opinion at 5,7-8, emphasis added.]

We cannot say that the continued input of phosphorus from the lakeside plants for at least another year or year and a half is de minimus. The nominal hydraulic capacity of the five smallest plants is 3,800,000 gallons per day. Using the commonly accepted concentration of 10 mg/l of phosphorus in domestic sewage the total daily input of phosphorus without any reduction is 335 pounds or 122,000 pounds per year. While it is true that such a quantity might have little impact on the accelerated eutrophication of the Lake if the input were evenly distributed it is also known that the mixing of in-shore and deep water areas is a slow process. Local problems could occur in the shoreline areas which are used for recreation and other important purposes. The already very high concentrations of phosphorus along the North Shore beaches indicate that this area can ill afford the risk of any continued additions. Compliance now may be what is needed to prevent a more serious algae problem in the area.

The premise for this variance request is that in order to provide the treatment for phosphorus removal which the regulation requires the District would have to construct temporary facilities and provide chemicals for addition to the treatment process at what the District considers unreasonable cost. The District's Chief Engineer outlined the program as to needed facilities, and chemical and labor costs. Buildings would have to be constructed at the various sites for an estimated aggregate cost of \$350,000 including tanks and associated

hardware. The cost of chemicals was estimated at \$153,000 per year. It was stated that additional sludge handling would annually add \$127,000 to the District's operating costs and labor costs would be increased \$12,000 annually (R.51-58). The cost to the District for the first year for the temporary phosphorus treatment facilities was thus estimated to be \$654,000 while the annual expenditure thereafter was estimated to be \$292,000 (R.58). The salvage value of the temporary facilities was estimated to be minimal (R.59-60, 83-84).

Beyond cross-examination the above cost estimates were not challenged at the hearing on April 6. However, at a later hearing on April 29 in connection with the compliance schedule resulting from the previously cited case (PCB 70-7, 12, 13, 14) the District made a representation which substantially changes this variance request and results in a very substantial lowering of the above cost estimate. Through Mr. Matthew Riddell, a consulting engineer for the District, the District withdrew its request for a variance for the North Chicago plant. Mr. Riddell stated that the 3.5 MGD of sewage treated at that plant would be in compliance with the regulation (PCB 70-7, 12, 13, 14; R.1451-2).

The Board takes official notice of this statement made under oath at a public hearing in a matter dealing with the same facilities. The District in effect sought to amend their petition to remove the North Chicago Plant from the variance request and we allow this amendment which removes almost half of the hydraulic capacity from the District's request. To make some realistic appraisal of the cost of phosphorus removal we must now re-evaluate the District's testimony as to cost. Before we do so several considerations not fully discussed at the hearing should be dealt with such as the magnitude of the building and hardware cost estimates, the chemical costs and the zero salvage value. It was estimated to cost \$50,000 per site for a building, tank and metering pump and associated hardware. The necessity for the various proposed buildings was not shown in any instance. Questions such as the use of existing buildings or insulated tanks were not addressed. Neither was the seemingly exorbitant cost of \$50,000 per site broken down in any detailed way.

The chemical precipitant selected for the six plants for which the variance was sought was alum (R.59). Very little was said regarding the use of free waste pickle liquor at other than the Waukegan plant (R.78). At the Waukegan plant the District will be effecting phosphorus removal in time to meet the Phosphorus Water Standards December 1971 deadline. The process used at that plant is the application of waste pickle liquor obtained at no cost except transportation from a local steel processing plant (R.43-44). The phosphorus removal is accomplished at what Mr. Anderson described as "very nominal" cost (R.45). Why not free pickle liquor at the other plants instead of the annual expenditure of \$153,000 for chemicals?

The zero salvage value ascribed to the capital equipment by the District's witness appears to be unrealistic for at least two reasons. If, for the temporary facilities, the District chose tanks and pumps of a size which could be used in their expansion plans the equipment could not then be thought to have no salvage value. Additionally, if, as appears likely, phosphorus removal becomes a more widespread requirement throughout Illinois the District might find a willing buyer for its used system in a nearby Sanitary District or other municipality.

Upon reappraisal of the District's cost estimate by elimination of those costs related to the North Chicago plant the estimate of capital costs is decreased from \$350,000 to \$250,000. The other costs are virtually cut in half. The District's estimate of the first year costs is thus reduced to \$396,000. Use of the free chemical supply (waste pickle liquor) and a realistic view of the salvage value and sludge handling costs would put the District's costs within the usual range of cost for treatment for phosphorus removal. At its rule-making hearing regarding Phosphorus Regulations, the Board heard testimony that phosphorus removal can easily be accomplished at a cost in the range of 2-4¢ per 1000 gallons. In that proceeding the Board concluded that the costs of operation were quite minor in relation to the amounts of phosphorus that treatment will keep out of the Lake. Nothing in the District's case indicates that operating costs will be more burdensome for them than for anyone else. Operating costs are not increased by the need to abandon a capital investment in a couple of years; the only unique hardship element in the District's case is the capital cost that allegedly cannot be recovered. Even if the District is right in every one of its cost estimates including operating costs, the total cost involved is peanuts in the context of an overall \$95,000,000 program, especially since the total cost for phosphorus removal is only one or two dollars per capita. To spend \$95,000,000 to clean up the Lake while begrudging \$1 to \$2 per capita to avoid worsening the Lake's most serious problem in the meantime would be foolish indeed.

The District's prediction of a maximum of one year's use from the temporary facilities is tenuous at best. On the record we have no assurances that the effluents for which the variance is sought will be diverted by the end of 1972. We have the District's representation that it intends that this be so but we know also that many of the District's recent activities have been stymied by litigation. Thus we can have no real confidence that if we grant a variance in this case we would not be in a similar position a year from now being asked to grant an extension of the variance. This is a significant aspect of our decision to deny this request for variance. In fact, the District, itself has stated at the later hearing on April 29, that it would not be until August 1973, at the earliest, that the five small plants could be diverted to the Clavey Road Plant (PCB 70-7, 12, 13, 14; R. 1340, 1343, 1358).

We have considered the legal arguments of res adjudicata and collateral estoppel raised in this case by the Environmental Protection Agency. The Agency asserted that the issues raised in this case had been litigated in League of Women Voters et al v. North Shore Sanitary District (supra) and further that the standard by which the variance request must be judged could have been raised as a defense in the prior cited case. The Board has not made its decision on considerations inherent in the doctrines of res judicata and collateral estoppel such as identity of claims and issues and identity of parties.

Res judicata or collateral estoppel, that body of law which prevents the relitigation of the same issue in a different proceeding, was deemed inapplicable in this case. The regulation from which the variance was sought was not in existence before the start of the previously cited case. The determination of that case can therefore not make the instant proceeding superfluous and a nullity. There are intimate connections between the two matters and we have had occasion to reference some of these; nonetheless we have decided this case not on procedural grounds but on the merits of the issues.

The District adopted a resolution on November 28, 1970 in which the Board of Trustees unanimously recognized that "excessive growth of algae and aquatic plants accelerates the aging of Lake Michigan, reduces its attractiveness for recreational uses, adversely affects fish and aquatic life, and interferes with the quality and procurement of public water supplies," and that "excessive discharges of phosphates to the Lake contributes to excessive growth of algae and aquatic plants." Further, the District admitted recognition of the fact that "synthetic detergents are a major source of phosphate in sewage effluents discharged to the Lake." By that resolution the District recommended "that municipalities within the District consider the adoption of...ordinances" to limit and ultimately ban the use and sale of high phosphate detergents.

With the Board's order today denying the requested variance we are acting with the purpose expressed in the District's own resolution. We are acting also in furtherance of the purposes of the Environmental Protection Act which in part are "to restore, maintain, and enhance the purity of the waters of this State in order to protect health, welfare property, and the quality of life, and to assure that no contaminants are discharged into the waters without being given the degree of treatment or control necessary to prevent pollution".<sup>1]</sup>

Further the act admonishes the Board to grant variances only in cases wherein an arbitrary or unreasonable hardship resulting from the application of the rule from which the variance is sought is shown. Mere imposition of a money cost standing alone cannot be considered an

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1] Environmental Protection Act, Section 11.

unreasonable hardship. In Springfield Sanitary District v. EPA, PCB 70-32 (January 27, 1971) we denied a variance which requested this Board to sanction the open bypass of 10 million gallons per day of raw sewage during a period during which sewer repairs were performed. The Springfield Sanitary District was compelled to undertake the project at approximately double the cost which it had estimated had the variance been granted and the District been allowed to bypass the raw sewage. The phosphorus effluent standard from which the exemption is sought imposes no arbitrary hardship on the District. Technology to cope with the problem is readily at hand. Several alternative ways are open to the District aside from its planned use of alum precipitation. Apart from its own successful experimentation with pickle liquor other chemical precipitation methods are available. To ask if the amount required for capital expenditures and other costs is a reasonable one is the same as asking as to the worth of Lake Michigan.

There is a bonus to be derived from phosphorus removal that was only touched upon at the hearing. On cross-examination Mr. Byers stated that increased suspended solids removal would be accomplished with treatment for phosphorus removal (R.80-81). This is of course well known and should not be overlooked in this case of greatly overloaded facilities. When alum is added to sewage it forms a flocculent precipitate which enmeshes and adsorbs both the suspended particles and colloidal matter. Such chemical treatment by enhancing coagulation of suspended solids has the effect of increasing the capacity of the treatment facilities thus allowing the overloaded facilities to provide more nearly complete treatment.

The instant case appears to be the kind of situation which a prominent civil engineer was particularly referring to recently when he addressed his fellow engineers:<sup>2]</sup>

I am ashamed to admit that...the old "pros" in the field of water pollution control appear to be lagging. The people...appear to have swept by us. We seem willing to settle for too little... . We build [sewage] treatment facilities-but we fear expenditures that exceed what is absolutely necessary to maintain minimum stream quality. We tolerate poor operation. We are satisfied with less than modern treatment techniques, and confine our new, advanced, waste treatment technology to pilot plants and research laboratories... . We take some enforcement actions, but we do not make "unreasonable" requests. Is "reasonableness" an excuse for weakness, and "prudence" another word for timidity? The cases in which a major [polluted] stream or lake has actually been restored can be counted on one hand... .

2] Eugene T. Jensen, Operations Chief, Water Quality Office, Federal Environmental Protection Agency, in an address to the American Society of Civil Engineers National Specialty Conference, Los Angeles, 1971; quoted in Saturday Review, May 1, 1970, p. 47.

The problem will not be solved merely by enactment of legislation, no matter how well conceived or how expertly drawn... . We, the professionals in the field of water pollution control, are going to have to change ourselves, our concepts, and our way of doing things... . First and foremost perhaps, we must stop being satisfied with yesterday's technology. New technology is available. Until it is transferred into actual treatment facilities, it is of little value. Just because we have relied on trickling filters and activated sludge plants in the past does not mean that we should continue to do so today.

If we are going to clean up, if we are going to stop pollution, if we are going to save Lake Michigan -- let's do it. Let's not be satisfied with doing only the absolute minimum which is forced upon us. And let us do it now.

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

I concur:

David P. Currie  
Samuel P. Eldridge  
John D. Dumelle  
Wm. D. Kepit  
Carl Kuntz

I dissent:

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I, Regina E. Ryan, Clerk of the Illinois Pollution Control Board, certify that the Board adopted this Opinion on this 9th day of June, 1971.

Regina E. Ryan  
Regina E. Ryan, Clerk  
Illinois Pollution Control Board