

ILLINOIS POLLUTION CONTROL BOARD
September 1, 1994

IN THE MATTER OF:)
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)
)
PETITION OF AKZO CHEMICALS,)
INC. FOR AN ADJUSTED STANDARD) AS 93-8
FROM 35 Ill. Adm. Code 304.105) (Adjusted Standard)
and 302.208.)

MARK LATHAM AND ROY HARSCH OF GARDNER, CARTON & DOUGLAS APPEARED ON BEHALF OF THE PETITIONER;

MARGARET P. HOWARD APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by G. T. Girard):

This matter is before the Board on a request by AKZO Chemicals (AKZO) for an adjusted standard from the Board's water regulations at 35 Ill. Adm. Code 304.105 and 302.208. AKZO is seeking an adjusted standard for discharges of total dissolved solids (TDS), chloride, sulfate, and boron into the Aux Sable Creek from the AKZO facility located in Morris, Grundy County, Illinois.

AKZO filed the original petition in this matter on August 20, 1993. On November 12, 1993, an amended petition was filed, and on February 2, 1994, a second amended petition was filed. The Illinois Environmental Protection Agency (Agency) filed a response to the November 11 petition on January 12, 1994, and to the February 2 petition on March 17, 1994. Hearing was held on this matter on May 5, 1994, in Morris, Grundy County, Illinois, before the Board's hearing officer, Philip Van Ness. One member of the public, Mr. Lawrence Dunbar, made a statement on the record. The parties filed no briefs in this proceeding.

For the reasons discussed below, the Board will grant the adjusted standard as requested in the second amended petition.

ADJUSTED STANDARD PROCEDURE

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 et seq.). The Board is charged therein to "determine, define and implement the environmental control standards applicable in the State of Illinois" (415 ILCS 5/5(b)) and to "grant *** an adjusted standard for persons who can justify such an adjustment" (415 ILCS 5/28/1(a)). More generally, the Board's responsibility in this matter is based on the system of checks and balances integral to Illinois environmental governance: the Board is charged with the rulemaking and principal adjudicatory functions,

and the Agency is responsible for carrying out the principal administrative duties.

The Act provides that a petitioner may request, and the Board may impose, an environmental standard that is different from the standard that would otherwise apply to the petitioner as the consequence of the operation of a rule of general applicability. Such a standard is called an adjusted standard. The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act and within the Board's procedural rules at 35 Ill. Adm. Code Part 106.

Where, as here, the regulations of general applicability does not specify a level of justification required for a petitioner to qualify for an adjusted standard, the Act at Section 28.1(c) specifies four demonstrations that must be made by a successful petitioner:

- 1) Factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;
- 2) The existence of those factors justifies an adjusted standard;
- 3) The requested standard will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
- 4) The adjusted standard is consistent with any applicable federal law.

FACILITY DESCRIPTION AND DISCHARGE LEVELS

AKZO produces fatty acid nitrogen derivatives that are used primarily as surfactants in agricultural products, personal care products and detergents. (Am.Pet. at 4.)¹ The AKZO facility at issue is located in a rural area at Table Road, P.O. Box 310, Morris, Illinois. Constructed in 1973, the AKZO facility currently employs 129 people. (Id.)

¹ The petition will be cited as "Pet. at ___"; the November 12, 1993, amended petition will be cited as "Am.Pet. at ___"; the February 2, 1994, amended petition will be cited as "2Am.Pet. at ___"; the Agency's response to the November 12, 1993, amended petition will be cited as "Res. at ___"; the Agency's response to the February 2, 1994, amended petition will be cited as "2Res. at ___".

The production process at the AKZO facility results in the generation of several wastewater streams which are treated by differing means prior to discharge. (Am.Pet. at 4.) Main process wastewater is collected, biologically treated and stored in a concrete reservoir for use in crop irrigation. (Id.) The excess from this process is discharged through outfall 001 to Aux Sable Creek. Outfall 002 is the discharge of wastewater from the steam generating boilers, water softener regeneration operations and stormwater runoff. (Id.) A pH adjustment station was installed on the discharge line from the boiler house to outfall 002 in 1984 to adjust the pH to within the limits imposed by AKZO's NPDES permit. (Id.)

The boron contained in AKZO's discharge is naturally occurring with no boron added in the process. (Am.Pet. at 5.) The process does add TDS, chloride, and sulfate to that which is naturally occurring in the water. (Id.) The process at AKZO's facility concentrates these constituents in the discharge. The average daily level of boron discharged over the last 28 months has been 0.78 mg/L, with a maximum of 1.4 mg/L, and eight readings of 1.0 mg/L or more. (Am.Pet. at 5.) The average daily TDS discharge concentration over the same period was 3,000 mg/L, with a maximum of 6,180 mg/L, and 15 readings of greater than 3,000 mg/L. (Id.)

According to the petition, recent samples show the levels of chloride and sulfate averaged at 1,566 mg/L and 286 mg/L, respectively, and maximum levels of 2,960 mg/L of chloride and 574 mg/L of sulfate. (Am.Pet. at 5.) Further, samples also indicate that the downstream and upstream levels of both chloride and sulfate are well below the stream standard of 500 mg/L. (Am.Pet. at 5-6.)

RULES OF GENERAL APPLICABILITY

The Board's general effluent regulations do not include specific limitations for either TDS² or sulfate. However, they do prohibit any discharge that would cause or contribute to a violation of any water quality standard (35 Ill. Adm. Code 304.105); there are water quality standards for both TDS and sulfate.

² The Board at one time adopted an effluent standard of 3,500 mg/L for TDS (R70-18, 3 PCB 419, January 7, 1972), but later repealed it after recognition that the treatment processes for TDS are expensive, consume large amounts of energy, and produce dry solids or brines, that themselves require disposal. (see Board's opinion in R76-21, 43 PCB 367, September 24, 1981, with final action at 44 PCB 203, December 3, 1981.)

In the instant case, the pertinent water quality standards are in the Board's General Use Water Quality Standards found at 35 Ill. Adm. Code 302.208. The General Use Water Quality Standard for TDS is 1000 mg/L and for sulfate is 500 mg/L. The General Use Water Quality Standard for boron is 1.0 mg/L and for chloride is 500 mg/L. The intent of these standards is to protect aquatic life and to safeguard the quality of water of the state for consumptive uses, including public water supply. These standards apply in Aux Sable Creek.

RELIEF REQUESTED

AKZO is requesting an adjusted standard from Sections 304.105 and 302.208 of the Board's water quality regulations. Specifically those regulations apply to the discharge of total dissolved solids (TDS), chloride, sulfate and boron from AKZO's Morris, Illinois, facility into Aux Sable Creek. (Am.Pet. at 1.)

AKZO in the second amended petition proposed the following adjusted standard language for adoption by the Board to effectuate the requested relief:

- 1) This rule shall apply to discharges from an existing facility owned and operated by AKZO Chemicals Inc. and located on Table Road, P.O. Box 310, Morris, Illinois.
- 2) This rule shall apply to discharges from outfall 002 to Aux Sable Creek. Such discharges shall not be subject to Section 304.105 as it applies to the water quality standards of 35 Ill. Adm. Code 302.208 for boron, chloride, sulfate and total dissolved solids.
- 3) Instead of the standards set forth in 35 Ill. Adm. Code 302.208 for those constituents in (2) above, the discharge from outfall 002 shall not exceed the following limitations:

CONSTITUENTS	STORET NUMBER	CONCENTRATION mg/L
Boron	01022	2.0
Chloride	00940	1000.
Sulfate	00945	1000.
Total Dissolved Solids	70300	3000.

- 4) AKZO Chemicals Inc. shall conduct a chronic whole effluent toxicity test on the discharge from outfall 002 within six (6) months of the effective

date of this rule and shall report the results to the Agency.

- 5) AKZO Chemicals Inc. shall conduct a stream survey in the vicinity of outfall 002. The stream survey shall sample aquatic macroinvertebrates to evaluate biological communities and evaluate water quality upstream and downstream of AKZO's discharge. The stream survey shall be conducted within six (6) months of the effective date of this rule and repeated in five (5) years. The results of the stream surveys shall be reported to the Agency.

The adjusted standard shall apply from outfall 002 to the confluence of Aux Sable Creek and the Illinois River.
(2Am.Pet. at 3-4.)

COMPLIANCE ALTERNATIVES

AKZO has investigated numerous alternatives for compliance with Sections 304.105 and 302.208. Specifically, AKZO investigated operating the boiler at an abnormally high blowdown rate. (Am.Pet. at 6.) This alternative would increase consumption of natural gas by the rate of 0.14 cubic feet per day or 51 million cubic feet per year in order to compensate for the heat lost in the excessive blowdown water. (Id.) As a result, operating cost would increase due to the added costs of fuel and boiler wear which would require additional maintenance on the boiler. (Id.)

AKZO also investigated installation of a reverse osmosis treatment system with offsite disposal. The installed cost for the system would be \$140,000 for boiler blowdown alone and would be an additional \$500,000 to \$700,000 for softening the larger boiler feed water stream. (Am.Pet. at 7.) This system would result in 25% to 33% of the discharge containing concentrated dissolved solids which would require offsite disposal and the levels of TDS, chloride, sulfate and boron would be even more elevated. (Id.) The cost of disposal offsite annually would range from \$4.4 to \$5.8 million for boiler blowdown and \$16.4 to \$21.5 million for boiler feed water. (Id.) AKZO also reviewed the possibility of evaporation instead of offsite disposal with the reverse osmosis system. (Id.) An evaporator would cost "approximately \$500,000 to \$1.0 million installed". (Id.)

AKZO evaluated the possibility of combining outfalls 001 and 002 and discharging the combined steam to the concrete reservoir for irrigation onto the spray field. (Am.Pet. at 8.) The additional wastewater would, however, overload the system and threaten the long term viability of the spray field because of the increased volume of salt and TDS. (Id.)

AKZO also reviewed modifying the existing softener regeneration system to allow isolation of the stream to recycle a portion of the brine rinse and slow rinse streams to reduce salt. (Am.Pet. at 9.) The capital costs for this option would be \$90,000 with an annual operating cost of \$65,000. (Am.Pet. at 10.) Also a possibility would be to allow for evaporation. (Id.) This option would have a capital cost of approximately \$300,000 and annual operating costs of \$115,000. (Am.Pet. at 11.)

AKZO examined two potential options for discharge to the Illinois River. The first involved using a pipeline to the river owned by a neighboring chemical plant at a cost of \$100,000. (Am.Pet. at 11.) However, the chemical plant will not allow any outside facilities to use its discharge pipes. (Id.) The second option involved AKZO building a discharge line to the Illinois river at a cost of \$400,000 and annual operating costs of \$35,000. (Id.)

AKZO's final option discussed was the demineralization of boiler feed water which would introduce additional hazards to the operation and would require piping of the regenerant streams to the existing pH neutralization system. (Am.Pet. at 12-13.) The cost of demineralization is approximately \$600,000 to \$750,000 plus annual operating costs on the order of \$50,000 to \$140,000. (Am.Pet. at 13.)

In support of its request AKZO argues that the cost of compliance is unreasonable. As indicated above, AKZO has studied numerous alternatives for compliance. Akzo argues that the alternatives are economically unreasonable and that some are also technically infeasible. (Am.Pet. at 6-13.)

The Agency indicated that it agrees that compliance with Sections 304.105 and 302.208 is "not technically feasible nor economically reasonable". (Res. at 1.) The Agency points out that AKZO has committed to recycling a portion of the high TDS waste stream from the water softener resin regeneration and will dispose of the highest TDS wastewater offsite. (Res. at 2.) However, despite AKZO's efforts at waste reduction and recycling the water quality standards may be exceeded. (Id.)

HEALTH AND ENVIRONMENTAL EFFECTS

In 1986, the Agency performed a biological survey on Aux Sable Creek. The survey entitled *Intensive Survey of Aux Sable Creek (DW) in the Vicinity of AKZO Chemie America Morris, Illinois* (Agency biosurvey) was performed in July of 1986. The survey indicates that "there was no apparent adverse impact in the vicinity of AKZO's discharge" to Aux Sable Creek. (Am.Pet. attachment 10 at 4.) Further, according to the survey, the stream has been classified by the Illinois Department of

Conservation "as a highly valued aquatic resource (Class B stream)" based on the fish data. (Id.)

The 1993 discharge rates from AKZO are higher than in 1986 (96,000 gallons per day versus 64,000 gallons per day); however, the average 1993 TDS concentrations and mass loadings are presently less than the 1986 levels because of a lower level of salt discharge. (Am.Pet. at 23.) AKZO indicates that there is no data on the discharge of sulfate, boron and chloride from its facility in 1986. However, AKZO also states that the process has not changed. Thus, it is unlikely that the discharge rate for those constituents would be significantly different. (Id.) AKZO also noted that based on historical sampling by the Agency from a sampling station located on Aux Sable Creek upstream of AKZO and samples collected by AKZO downstream, "the stream standards for TDS, Chloride, sulfate and boron should not be exceeded under normal creek flow." (Am.Pet. at 23.)

In further support, AKZO reviewed extensive scientific literature, including the Agency biosurvey, which demonstrates that the requested adjusted standard would have "little or no adverse environmental impact". (Am.Pet. at 24.) Specifically AKZO found that bluegill, carp, fathead minnows and certain types of bass are present in Aux Sable Creek and are among the fish for which toxicity information is available. (Am.Pet. at 14.) One study reviewed by AKZO is authored by Paula Reed and Ralph Evans entitled *Acute Toxicity of Chlorides, Sulfates and Total Dissolved Solids to Some Fishes in Illinois*. That study concludes that:

Maximum permissible concentrations of 800 mg/L chloride and 1,000 mg/L sulfate (TL50 concentrations divided by 10) are more reasonable standards than the 500 mg/L Illinois stream standard. In addition, the study suggested that the maximum permissible concentration of TDS was 1,300 mg/L to 1,500 mg/L where chloride was the principal constituent and 1,400 mg/L to 1,750 mg/L where sulfate was the principal constituent.

(Am.Pet at 15.)

AKZO argues that based on the results of the literature search it has performed, sufficient data exists to support the conclusion that the adjusted standard for TDS, chloride and sulfate requested will not harm aquatic life. (Am.Pet. at 20.)

The Agency agrees that the literature reviewed by AKZO indicates that the requested adjusted standard will not be toxic to most fishes. (Res. at 2.) The Agency also agrees that the adjusted standard will not have an adverse impact on the environment. (Res. at 3.) The Agency states that AKZO's effluent has not had a discernible impact on the receiving stream

over the years of operation prior to the 1986 survey. (Res. at 5.) Further, the requested adjusted standard is a decrease in the discharge from the past and is supported by the Agency. (Id.) The Agency recommends that chronic toxicity testing be a condition of the adjusted standard as well as a requirement that AKZO perform studies similar to the Agency biosurvey. (Res. at 5-6.)³

CONSISTENCY WITH FEDERAL LAW

Both the Agency and petitioners agree that the Board's water quality standards have been approved by U.S. EPA and are consistent with the requirements of the Clean Water Act. Thus, the Board's standards exist pursuant to Section 303(a) of the Clean Water Act. (Am.Pet. at 3; Res. at 1.) AKZO does not believe that the granting of the requested adjusted standard would be violative of any provisions of the Clean Water Act. The requested relief is predicated solely upon potential violations of the TDS water quality standard and the standard for sulfate. There are no applicable federal or state TDS or sulfate effluent standards. (Am.Pet at 25.)

The adjusted standard is also consistent with federal law in that under 40 C.F.R. 131.4, "states are responsible for reviewing, establishing and revising water quality standards". In turn, pursuant to 40 C.F.R. 131.5, "EPA is to review and to approve and disapprove the State-adopted water quality standards". These standards are to be protective of the designated uses (§131.5(b)) and, where those uses are not protected, this must be supported by "appropriate technical and scientific data and analyses". (§131.5(d).) A state is allowed to remove a designated use, which is not an existing use, if it "can demonstrate that attaining the designated use is not feasible" because of several enumerated causes. (40 CFR 131.10(g).) Petitioners believe that the granting of this adjusted standard will not impair any beneficial use of the receiving stream. This, they believe, has been established by the Agency biosurvey. (Am.Pet. at 25.)

Federal Procedural Requirements

The Board's grant of the adjusted standard requested herein arguably requires some mechanism for public participation pursuant to 40 C.F.R. §131.20(b). However, AKZO does not believe that a hearing is necessary and agrees with the U.S. EPA's

³ The second amended petition amended the request for adjusted standard to include the chronic toxicity testing condition and the condition requiring studies be performed.

current position that if authorized states follow approved state procedures, those procedures are federally acceptable.

Under federal law, public participation includes a public hearing for the purpose of reviewing the proposed standard in accordance with the provisions of state law, the U.S. EPA's water quality management regulation (40 C.F.R. 130.6(b)) and the U.S. EPA's public participation regulation (40 C.F.R. Part 25). Notice of such hearing must be well-publicized and must be given at least forty-five (45) days prior to the date of the hearing. The notice must identify the matters to be discussed and should include a discussion of the Board's tentative determination on information. Reports, documents and data relevant to the discussion at the public hearing must be available to the public at least thirty (30) days before the hearing. 40 C.F.R. §25.5(b). At the hearing, the Board must inform the audience of the issues involved, considerations the Board will take into account, and information which is particularly solicited from the public. 40 C.F.R. §25.5(e).

AKZO understands that the U.S. EPA has recently changed its position regarding the federal requirement for a hearing in state proceedings involving the potential amendment of water quality standards. The U.S. EPA formerly took the position that hearings were required in all such proceedings. AKZO understands, however, that U.S. EPA's present position is that the fulfillment of the state requirements for notice and hearing is all that is required and that if the state allows for waiver of the hearing requirement, hearing can be waived without conflict with the federal laws. 35 Ill. Adm. Code 106.705(j) allows for waiver of hearing.

Finally, AKZO argues that requested adjusted standard will not violate federal law and is consistent with federal law. (Am.Pet. at 30-31.) The Agency agrees that the requested relief is consistent with federal law. (Res. at 5.)

CONCLUSION

AKZO is requesting that the Board grant an adjusted standard from the Board's water quality standards for discharge of TDS, chloride, sulfate and boron from outfall 002 to Aux Sable Creek at AKZO's facility. AKZO has presented in its amended petition a literature review of related studies including the 1986 Agency biosurvey. The literature review indicates that the levels of discharge requested would not adversely impact the receiving stream. Most significantly, AKZO has submitted the Agency biosurvey, which is an ecological study of the receiving stream which demonstrated no adverse environmental impact from the AKZO's discharge. AKZO has also lowered its discharge rate for salt from the rate of discharge in effect when the Agency biosurvey was conducted.

AKZO has demonstrated that of the possible compliance alternatives available to AKZO, none are technically feasible or economically reasonable. AKZO also established that the adjusted standard is consistent with federal law. The Agency supports granting the adjusted standard. The Agency agrees with the statements made by AKZO in the amended petition in all substantive areas and supports granting the adjusted standard.

The Board finds that petitioner, in cooperation with the Agency, has demonstrated that grant of the adjusted standard is warranted. The Board accordingly will grant the adjusted standard consistent with this opinion.

This opinion constitutes the Board findings of fact and conclusions of law in this matter.

ORDER

The Board hereby grants the following adjusted standard to AKZO Chemical:

- 1) This rule shall apply to discharges from an existing facility owned and operated by AKZO Chemicals Inc. and located on Table Road, P.O. Box 310, Morris, Illinois.
- 2) This rule applies to discharges from outfall 002 to Aux Sable Creek. Such discharges are not subject to Section 304.105 as it applies to the water quality standards of 35 Ill. Adm. Code 302.208 for boron, chloride, sulfate and total dissolved solids.
- 3) Instead of the standards set forth in 35 Ill. Adm. Code 302.208 for those constituents in (2) above, the discharge from outfall 002 shall not exceed the following limitations:

CONSTITUENTS	STORET NUMBER	CONCENTRATION mg/L
Boron	01022	2.0
Chloride	00940	1000.
Sulfate	00945	1000.
Total Dissolved Solids	70300	3000.

- 4) AKZO Chemicals Inc. shall conduct a chronic whole effluent toxicity test on the discharge from outfall 002 within six (6) months of the effective

date of this rule and shall report the results to the Agency.

- 5) AKZO Chemicals Inc. shall conduct a stream survey in the vicinity of outfall 002. The stream survey shall sample aquatic macroinvertebrates to evaluate biological communities and evaluate water quality upstream and downstream of AKZO's discharge. The stream survey shall be conducted within six (6) months of the effective date of this order and repeated in five (5) years. The results of the stream surveys shall be reported to the Agency.


The adjusted standard applies from outfall 002 to the confluence of Aux Sable Creek and the Illinois River.

IT IS SO ORDERED.

Board Member Marili McFawn concurs.

Section 41 of the Environmental Protection Act (415 ILCS 5/40.1) provides for the appeal of final Board orders within 35 days of service of this decision. The Rules of the Supreme Court of Illinois establish filing requirements. (But see also, 35 Ill. Adm. Code 101.246, Motions for Reconsideration.)

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 15th day of September, 1994, by a vote of 6-0.


Dorothy M. Gunn, Clerk
Illinois Pollution Control Board