

ILLINOIS POLLUTION CONTROL BOARD
September 18, 1997

IN THE MATTER OF:)
)
SITE SPECIFIC PETITION OF MOBIL OIL) R97-28
CORPORATION FOR RELIEF FROM) (Rulemaking - Water)
35 ILL. ADM. CODE 304.122, AMMONIA)
NITROGEN EFFLUENT STANDARDS)

Proposed Rule. First Notice.

OPINION AND ORDER OF THE BOARD (by R.C. Flemal):

This matter comes before the Board upon a petition for rulemaking filed by Mobil Oil Corporation (Mobil) on April 24, 1997. Mobil requests that the Board's effluent regulations, as applicable to Mobil's refinery near Joliet, be amended to provide site-specific ammonia nitrogen effluent standards for Mobil's discharge to the Des Plaines River.

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 et seq. (1996)). 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). More generally, the Board's rulemaking charge is based on the system of checks and balances integral to Illinois environmental governance: the Board bears responsibility for the rulemaking and principal adjudicatory functions; the Agency has primary responsibility for administration of the Act and the Board's regulations, including the regulations today proposed for amendment. The Agency has indicated that it supports adoption of the proposed amendments. Tr. at 12.

By today's action the Board adopts the proposed amendments for first notice, pursuant to the Illinois Administrative Procedure Act (5 ILCS 100/1-1 et seq. (1996)). Publication in the *Illinois Register* will follow today's action, whereupon a 45-day public comment period will begin during which interested persons may file public comment with the Board.

BACKGROUND

Mobil owns and operates a petroleum refinery (Joliet Refinery) located near the Des Plaines River in western Will County, approximately 10 miles southwest of Joliet. The refinery, which began operations in 1973, is Mobil's newest domestic refining facility. Pet. at 4. It has a rated capacity of 200,000 barrels of crude oil throughput per operating day and employs 575 persons. Pet. at 4. Products include motor gasolines and distillate fuel oil, kerosene jet fuel, propane, petroleum coke, sulfur, and some heavy fuel oil. Pet. at 4.

Water is used for various processes within the refinery. Waste process water, plus contaminated surface run-off, is processed through an on-site waste water treatment plant

(WWTP) at an average rate of approximately 1900 gallons per minute. Pet. at 5. Discharge is to the Des Plaines River via an outfall nominated Outfall 001. Mobil holds a National Pollution Discharge Elimination System (NPDES) permit for this discharge. The ammonia nitrogen concentration of this discharge is the subject matter of the instant proceeding.

REGULATORY BACKGROUND

The Board has promulgated various regulatory provisions that govern effluent discharges. Among these are provisions related to the discharge of ammonia nitrogen to the Illinois River, the Calumet River System, and parts of the Des Plaines River, as found at 35 Ill. Adm. Code 304.122. Subsection 304.122(b) contains the provision applicable to the Joliet Refinery. In pertinent part, Subsection 304.122(b) provides that:

Sources ... whose untreated waste load cannot be computed on a population equivalent basis comparable to that used for municipal waste treatment plants and whose ammonia nitrogen discharge exceeds 45.4 kg/day (100 pounds per day) shall not discharge an effluent or more than 3.0 mg/l of ammonia nitrogen.

The 3.0 mg/L standard of Section 304.122(b) applies to monthly average samples, as is specified at 35 Ill. Adm. Code. 304.104(a)(1).

In 1988 the Board granted Mobil a site-specific rule to supplant temporarily the Section 304.122(b) rule.¹ This site-specific rule, found at 35 Ill. Adm. Code 304.214, provided ammonia nitrogen discharge limits for Mobil's Joliet Refinery of 20 mg/L measured as a monthly average and 35 mg/L measured as a daily composite. Section 304.214 expired by its own terms on December 31, 1993. However, Section 304.214 has not been repealed, and thus still remains within the corpus of the Board's regulations.

Prior to the expiration of Section 304.214, Mobil petitioned the Board for a variance from the underlying regulation at Section 304.122. The Board granted the variance on March 3, 1994.² This variance was scheduled to terminate on March 3, 1998, and, among other matters, required that if Mobil were to seek new and permanent site-specific relief, it do so by May 3, 1996. During the period of this variance, ammonia nitrogen discharges were capped at a maximum of 13 mg/L measured as a monthly average and 26 mg/L measured as a daily maximum.

¹ In the matter of: Proposal of Mobil Oil Corporation to Amend the Water Pollution Regulations (January 7, 1988), R84-16.

² Mobil Oil Corporation v. Illinois Environmental Protection Agency (March 3, 1994), PCB 93-151.

On August 15, 1996 the Board granted Mobil a variance modification that extended the end date of the variance until March 3, 1999 and extended the date for filing for standards alternative to those at Section 304.122(b) until May 3, 1997.³ With the filing of the instant petition, Mobile has complied with the filing date requirement.

In the instant proposal Mobil requests that ammonia nitrogen effluents limits applicable to the Joliet Refinery be permanently set at 9.0 mg/L measured as a monthly average and 23.0 mg/L measured as a daily maximum. Mobil further requests that this proposal be effectuated by reactivation of Section 304.214, with the new effluent limits replacing the old, and with the old expiration date deleted.

PROCEDURAL HISTORY

A public hearing in this matter was held before hearing officer Audrey Lozuk-Lawless in Bolingbrook, Illinois, on July 2, 1997. Mobil presented three witnesses: Lilliana Gachich, Environmental Advisor employed by Mobil; James E. Huff of Huff & Huff, Inc.; and John H. Koon of Parsons Engineering Science, Inc.

Mobil filed a post-hearing brief on July 28, 1997. The record in this matter was scheduled to close on July 28, 1997. On August 6, 1997, the Environmental Bureau of the Illinois Attorney General's office filed a motion for leave to file comments instanter and accompanying comments. PC 1. On August 11, 1997 the hearing officer issued an order granting the motion instanter and accepting the comments. Given the technical nature of the comments, and to allow response from the Agency and Mobil, the hearing officer extended the time the record would remain open until August 25, 1997.

On August 11, 1997 Mobil filed a motion for leave to file additional comments and accompanying supplemental post-hearing comments. The Board grants Mobil's motion for leave to file. On August 25, 1997, the Agency timely mailed a response to the Attorney General's comments, which was filed with the Board on August 29, 1997. PC 3.

JUSTIFICATION

Environmental Considerations

Mobil believes that the environmental impact of the proposed ammonia nitrogen load in the Des Plaines River will be insignificant. Pet. at 12. Mobil presented a study conducted by Huff & Huff, Inc. indicating that at the proposed standards, continued discharge of ammonia nitrogen would not significantly change the levels of ammonia nitrogen in the Des Plaines or Illinois Rivers, nor would it threaten water quality or the aquatic community in those rivers.

³ Mobil Oil Corporation v. Illinois Environmental Protection Agency (August 15, 1996), PCB 96-218.

Mobil's contention is based principally on the relatively large amount of dilution that is available in the receiving waterway, the relatively small size of the discharge plume, and speed with which mixing occurs. Exh. 5. On this basis, Mobil concludes that discharge under the terms of the proposed site-specific standards will not cause violation of the in-stream water quality standards either at the point of discharge or downstream. Pet. at 12-13.

It is noteworthy that at the point at which discharge to the Des Plaines River occurs, the river is classified as a secondary contact waterway. 35 Ill. Adm. Code 303.441(i). The applicable water quality standard for secondary contact waters is 0.1 mg/L of un-ionized ammonia nitrogen. 35 Ill. Adm. Code 302.407. Mobil contends that it could discharge total ammonia nitrogen at concentrations as high as 70 mg/L in the summer and 243 mg/L during the winter, and still maintain compliance with the water quality standard at the edge of a mixing zone. Exh. 5 at 17-18.

The secondary contact portion of the Des Plaines River extends downstream as far as the I-55 bridge (35 Ill. Adm. Code 303.441(i)), which is approximately 1,000 feet downstream from Mobil's 001 outfall (Tr. at 53). Mobil contends that its proposed discharges would not cause violation of the ammonia general use water quality standards applicable downstream from the I-55 bridge. Tr. at 52.

Ms. Lilliana Gachich also testified that the water conservation efforts at the Joliet refinery inevitably result in more concentrated effluent. PC 1. Mobil lessens the water discharge to the sewer by increasing in-plant water reuse and increasing cooling tower recycling. PC 1. This highly concentrated effluent may impede the treatment because there is less dilution in the discharge water as compared to other plants of a similar nature. Tr. at 15. However, environmentally speaking, Mobil believes it is behooved to practice water concentration. Tr. at 15.

The Agency did not comment specifically on the environmental considerations of Mobil's proposed standard.

Economic Considerations and Alternative Technologies

Mobil has not been able to consistently comply with the Board's effluent standards due to an unstable nitrification process. Pet. at 2. However, Mobil has not found a technologically reasonable and economically feasible ammonia nitrogen treatment system to meet the required standard consistently.

Mobil evaluated alternative technologies to meet the Board's ammonia nitrogen standard, and found that each has significant capital and operating costs. Mobil has already expended \$7.78 million on an Ammonia Optimization Study and related equipment upgrades to its treatment facility to meet the Board's effluent standards. Pet. at 13. Those expenditures have cost Mobil an average of \$16/lb of ammonia removed. However, the incremental cost to remove ammonia beyond the upgraded BAT system would be disproportionate, costing \$421/lb. Mobil estimates that this would increase capital costs \$920,000, and increase

operating costs \$1.4 million. Pet. at 14. Furthermore, Mobil claims that “the other technologies will not be effective since the inhibition appears to arise also within the wastewater treatment system itself and not as a result of other waste streams”. Pet. at 13.

Breakpoint Chlorination Alternative

The Attorney General contends that the Board should not grant Mobil its requested adjusted standard because “technology exists which is both technologically feasible and economically reasonable to effectively control excess ammonia in the effluent.” PC 1 at 1. Specifically, the Attorney General contends that Mobil has failed to identify that breakpoint chlorination is a generally recognized and accepted treatment, and is in fact one of the most effective treatment technologies for ammonia in wastewater effluent. AG Com. at Attachment A, citing Metcalf & Eddy, Inc., *Wastewater Engineering, Treatment, Disposal, and Reuse*, (3d ed. 1991). The Attorney General argues that the capital cost of breakpoint chlorination is “minuscule”, and the cost of operating is minimized by the fact it is only used when ammonia is expected to approach the standard limits. He also states that Mobil has not adequately evaluated the discharge’s impact on the receiving stream, and therefore Mobil’s claim of no negative impact has not been demonstrated conclusively. PC 1 at 2. Lastly, the Attorney General argues that one of the reasons for the high ammonia discharge is the fact that Mobil buys crude oil with a high sulfur and high nitrogen content at a cheaper cost. However, that economic benefit should not be a detriment to the People of Illinois. PC 1 at 3.

Mobil points out that it did evaluate breakpoint chlorination as a possible alternative treatment strategy (Exh. 3, pp. 4-11-4-17), but that the disadvantages outweigh the advantages. The several substantial disadvantages include: high operating costs, the potential formation of chlorinated organics, handling/safety hazards with chlorine gas, required dechlorination, the potential for an increase in TDS, high chlorine residuals which are toxic to aquatic organisms, and trihalomethane formation in the waste water. Exh. 3, p.4-14. When considering that chlorine is highly toxic, and the fact that additional treatment would not produce any environmental benefit, installing breakpoint chlorination is not beneficial. Mobil disagrees with the characterization that the \$2.2 million capital cost is “minuscule”. Also, there is nothing in the record to show that the equipment could be used only sporadically. Addressing the operating costs, Dr. Koon calculated that the incremental cost of removing one pound of ammonia at \$163/lb. Exh. 4 at 10.

Addressing the impact on the receiving stream, the Des Plaines River, Mobil states that the levels sought to be discharged are significantly below the level necessary for compliance with the Secondary Contact or General Use water quality standards.

The Agency does not support the Attorney General’s comment to install a breakpoint chlorination and de-chlorination system at the Joliet Refinery. The Agency points out disadvantages not cited by Mobil including the process’ pH sensitivity and the elevation of dissolved solids concentrations in effluent. The Agency maintains that the Board should grant Mobil the adjusted standard as requested and not require breakpoint chlorination.

The Board agrees with the Agency and shares some of the same concerns with utilizing breakpoint chlorination at the Joliet Refinery. The Board is particularly concerned that the potential formation of trihalomethanes would constitute an unjustifiable environmental hazard. The Board is persuaded by the comments of the Agency, including the following:

The Illinois EPA has been concerned about breakpoint chlorination over the past twenty-five years due to the formulation of trihalomethanes during the process. Trihalomethanes are toxic and, when found in public water supplies, are considered to be carcinogenic to humans. For this reason, the Illinois EPA has, as a general practice, disallowed the process. The Illinois EPA has only permitted the process at one or two facilities in the state. August 29, 1997
Agency Comments.

The only scientific evidence provided by the Attorney General for its request are two pages from the book, *Wastewater Engineering, Treatment, Disposal, Reuse*, listing the advantages and disadvantages of breakpoint chlorination. Metcalf & Eddy, Inc., *Wastewater Engineering, Treatment, Disposal, and Reuse*, (3d ed. 1991). However the pages list more disadvantages associated with breakpoint chlorination than advantages. The Attorney General also included an article from the Chicago Tribune (Attachment B) relating to the water quality of the Des Plaines River, based primarily upon observances by the Agency. However, the Agency has specifically commented to the Board on the appropriateness of installing breakpoint chlorination at the Joliet Refinery and clearly states that breakpoint chlorination is not appropriate. The Board is not persuaded by a newspaper article relating generally to the water quality of the Des Plaines River, when the Agency has filed specific comments with the Board contrary to the newspaper article. The Board finds that to require Mobil to install breakpoint chlorination as a prerequisite to granting the requested adjusted standard is inappropriate.

Sunset Provision

The Attorney General requests that, in the absence of outright denial of Mobil's requested site-specific rule, the Board alternatively "sunset" the rule. PC 1 at 4. That is, the Attorney General requests that a provision be written into the rule that would cause the rule to expire at some future date certain. The Attorney General requests that this date certain be one year from the effective date of the site-specific rule. PC 1 at 4.

The Board believes that the Attorney General's sunset recommendation warrants further consideration, and for that purpose the Board today proposes for first notice a variation on the Attorney General's suggestion. The variation is a proposal that the site-specific rule expire by its own terms ten years after the effective date of the rule.

The Board believes that a sunset provision may be appropriate in light of the history of this matter. In particular, it is of record that Mobil has been able to comply with progressively lower ammonia discharge limits over the roughly ten year history of this matter (e.g., 20 mg/L in the 1988 site-specific rule, 13 mg/L in the variance currently applicable, and 9 mg/L in the

instant proposal). Accordingly, the Board believes it would be appropriate to have this matter revisited as some future time to see whether today's requested discharge limits continue to be appropriate at that future time.

The Board further believes that ten years hence might be an appropriate time for the matter to be revisited. We accordingly today propose that the site-specific rule expire after ten years. We particularly request comment during the first notice period on this proposed term, as well as on all aspects of the sunset provision.

Federal Consistency

According to Mobil, the "Joliet Refinery's WWTP effluent parameters meet or are well below all federal effluent guidelines and standards for the appropriate petroleum refinery point source subcategory (40 CFR 419, Subpart B - Cracking Subcategory)." Pet. at 14. The flow rate used to derive the Best Available Technology (BAT) effluent values for a refinery the size and configuration of Joliet's is 5200 gallons per minute (gpm), where the Refinery's current flow rate is 1900 gpm, with a maximum hydraulic flow rate of 2500 gpm. The calculated BAT ammonia limit is 956 lbs/day monthly average and 2104 lbs/day daily maximum, where the Refinery's current is 205 - 270 lbs/day. Pet. at 14.

CONCLUSION

The Board believes that Mobil has presented evidence warranting continuing consideration of this matter. Accordingly, we today find that the record before us justifies adopting the proposal for first notice.

The Board will again review the record in this matter upon completion of the first notice period, and determine then whether the record continues to support moving this matter towards adoption.

ORDER

The Board hereby proposes for first notice the following amendments to 35 Ill. Adm. Code 304.214. The Clerk of the Board is directed to file these proposed rules with the Secretary of State.

TITLE 35: ENVIRONMENTAL PROTECTION
 SUBTITLE C: WATER POLLUTION
 CHAPTER I: POLLUTION CONTROL BOARD

PART 304
 EFFLUENT STANDARDS

SUBPART A: GENERAL EFFLUENT STANDARDS

Section	
304.101	Preamble
304.102	Dilution
304.103	Background Concentrations
304.104	Averaging
304.105	Violation of Water Quality Standards
304.106	Offensive Discharges
304.120	Deoxygenating Wastes
304.121	Bacteria
304.122	Total Ammonia Nitrogen (as N: STORET number 00610)
304.123	Phosphorus (STORET number 00665)
304.124	Additional Contaminants
304.125	pH
304.126	Mercury
304.140	Delays in Upgrading (Repealed)
304.141	NPDES Effluent Standards
304.142	New Source Performance Standards (Repealed)

SUBPART B: SITE SPECIFIC RULES AND EXCEPTIONS NOT OF GENERAL
APPLICABILITY

Section	
304.201	Wastewater Treatment Plant Discharges of the Metropolitan Sanitary District of Greater Chicago
304.202	Chlor-alkali Mercury Discharges in St. Clair County
304.203	Copper Discharges by Olin Corporation
304.204	Schoenberger Creek: Groundwater Discharges
304.205	John Deere Foundry Discharges
304.206	Alton Water Company Treatment Plant Discharges
304.207	Galesburg Sanitary District Deoxygenating Wastes Discharges
304.208	City of Lockport Treatment Plant Discharges
304.209	Wood River Station Total Suspended Solids Discharges
304.210	Alton Wastewater Treatment Plant Discharges
304.211	Discharges From Borden Chemicals and Plastics Operating Limited Partnership Into an Unnamed Tributary of Long Point Slough
304.212	Sanitary District of Decatur Discharges
304.213	UNO-VEN Refinery Ammonia Discharge
304.214	Mobil Oil Refinery Ammonia Discharge
304.215	City of Tuscola Wastewater Treatment Facility Discharges
304.216	Newton Station Suspended Solids Discharges
304.218	City of Pana Phosphorus Discharge
304.219	North Shore Sanitary District phosphorus Discharges
304.220	East St. Louis Treatment Facility, Illinois-American Water Company
304.221	Ringwood Drive Manufacturing Facility in McHenry County

304.222 Intermittent Discharge of TRC

SUBPART C: TEMPORARY EFFLUENT STANDARDS

Section

304.301 Exception for Ammonia Nitrogen Water Quality Violations (Repealed)
 304.302 City of Joliet East Side Wastewater Treatment Plant
 304.303 Amerock Corporation, Rockford Facility

Appendix A References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/13 and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 30, p. 343, effective July 27, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; amended at 4 Ill. Reg. 20, p. 53 effective May 7, 1980; amended at 6 Ill. Reg. 563, effective December 24, 1981; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 7 Ill. Reg. 3020, effective March 4, 1983; amended at 7 Ill. Reg. 8111, effective June 23, 1983; amended at 7 Ill. Reg. 14515, effective October 14, 1983; amended at 7 Ill. Reg. 14910, effective November 14, 1983; amended at 8 Ill. Reg. 1600, effective January 18, 1984; amended at 8 Ill. Reg. 3687, effective March 14, 1984; amended at 8 Ill. Reg. 8237, effective June 8, 1984; amended at 9 Ill. Reg. 1379, effective January 21, 1985; amended at 9 Ill. Reg. 4510, effective March 22, 1985; peremptory amendment at 10 Ill. Reg. 456, effective December 23, 1985; amended at 11 Ill. Reg. 3117, effective January 28, 1987; amended in R84-13 at 11 Ill. Reg. 7291 effective April 3, 1987; amended in R86-17(A) at 11 Ill. Reg. 14748, effective August 24, 1987; amended in R84-16 at 12 Ill. Reg. 2445, effective January 15, 1988; amended in R83-23 at 12 Ill. Reg. 8658, effective May 10, 1988; amended in R87-27 at 12 Ill. Reg. 9905, effective May 27, 1988; amended in R82-7 at 12 Ill. Reg. 10712, effective June 9, 1988; amended in R85-29 at 12 Ill. Reg. 12064, effective July 12, 1988; amended in R87-22 at 12 Ill. Reg. 13966, effective August 23, 1988; amended in R86-3 at 12 Ill. Reg. 20126, effective November 16, 1988; amended in R84-20 at 13 Ill. Reg. 851, effective January 9, 1989; amended in R85-11 at 13 Ill. Reg. 2060, effective February 6, 1989; amended in R88-1 at 13 Ill. Reg. 5976, effective April 18, 1989; amended in R86-17B at 13 Ill. Reg. 7754, effective May 4, 1989; amended in R88-22 at 13 Ill. Reg. 8880, effective May 26, 1989; amended in R87-6 at 14 Ill. Reg. 6777, effective April 24, 1990; amended in R87-36 at 14 Ill. Reg. 9437, effective May 31, 1990; amended in R 88-21(B) at 14 Ill. Reg. 12538, effective July 18, 1990; amended in R84-44 at 14 Ill. Reg. 20719, effective December 11, 1990; amended in R86-14 at 15 Ill. Reg. 241, effective December 18, 1990; amended in R93-8 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R87-33 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R95-14 at 20 Ill. Reg. 3528, effective February 8, 1996; amended in R94-1(B) at 21 Ill. Reg. 364, effective December 23, 1996; amended in R97-28 at ___ Ill. Reg. _____, effective _____.

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

PART 304
EFFLUENT STANDARDS

SUBPART B: SITE SPECIFIC RULES AND EXCEPTIONS
NOT OF GENERAL APPLICABILITY

Section 304.214 Mobil Oil Refinery Ammonia Discharge

- a) This Section applies to discharges from Mobil Oil Corporation's Refinery, located near Joliet, into the Des Plaines River.
- b) The requirements of Section 304.122(b) ~~shall do~~ not apply to Mobil's discharge. Instead Mobil's discharge ~~shall~~ may not exceed the following limitations:

CONSTITUENT	CONCENTRATION (mg/l)
Ammonia Nitrogen	
Monthly Average	20 <u>9.0</u>
Daily Composite <u>Maximum</u>	35 <u>23.0</u>

- c) Section 304.104(a) ~~shall~~ does not apply to this Section. Monthly average and daily composites are as defined in Section 304.104(b).
- d) Mobil shall monitor the nitrogen concentration of its oil feedstocks and report on an annual basis such concentrations to the Agency. The report shall be filed with the Agency by January 31 of each year.
- e) The provisions of this Section shall terminate on December 31, ~~1993~~ 2007.

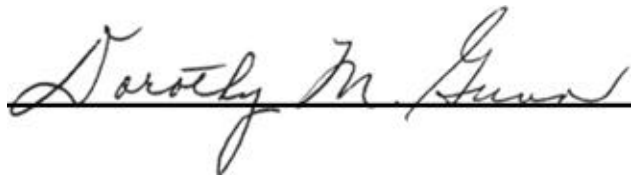
(Source: Amended at _____ Ill. Reg. _____, effective _____)

IT IS SO ORDERED.

Board Member Kathleen M. Hennessey abstained.

Board Member J. Theodore Meyer dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 18th day of September 1997, by a vote of 5-1.

A handwritten signature in cursive script, reading "Dorothy M. Gunn", is written over a solid horizontal line.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board