

ILLINOIS POLLUTION CONTROL BOARD
March 19, 1987

IN THE MATTER OF:)
) R84-13
PROPOSAL OF UNION OIL COMPANY)
OF CALIFORNIA TO AMEND THE WATER)
POLLUTION REGULATIONS)
)

ADOPTED RULE. FINAL ORDER.

FINAL OPINION AND ORDER OF THE BOARD (by J. Marlin):

This matter comes before the Board upon the April 25, 1984 filing of a proposal by Union Oil Company of California (Union) requesting relief from the 3 mg/l ammonia nitrogen effluent standard established in 35 Ill. Adm. Code 304.122(b). Union requests that instead it be required to meet the federal best available technology economically achievable (BAT) limitations set forth in 40 CFR 419.23 (1985). Union has calculated and the Agency has not disagreed that the allowable BAT ammonia nitrogen limits would be 775 lbs/day monthly average and 1705 lbs/day daily maximum (Exh. 9 at 5; see Exh. 8 App. C). For comparison purposes, 775 lbs/day is approximately 29 mg/l (R. 60). At hearing Union requested dissolved oxygen (DO) WQS relief in the event the Board determines that Union causes or contributes to a dissolved oxygen violation in the Illinois River.

Hearing was held on December 12, 1984 in Lemont, Illinois. The Department of Energy and Natural Resources (DENR) determined that an economic impact study was unnecessary and filed its negative declaration to that effect on May 13, 1985. The Economic and Technical Advisory Committee agreed with this finding, filing its concurrence on May 16, 1985. On July 8, 1985, the Agency submitted its brief recommending that relief be denied. The last brief, by Union prior to First Notice, was submitted on July 31, 1985. In response to a Board inquiry on the status of the Calumet wastewater treatment plant, Union filed on November 21, 1985, a letter which contained information obtained from the Illinois Environmental Protection Agency (Agency).

The proposed rule was sent to First Notice on March 14, 1986. Union and the Agency filed comments on First Notice on May 19 and June 27, 1986, respectively. The Agency comments included a USEPA review statement.

The Board adopted a Proposed Rule, Second Notice on January 8, 1987. The Second Notice period expired on March 2, 1987. At its March 4, 1987 meeting, the Joint Committee on Administrative Rules issued a certificate of no objection to the

proposed rule. The Board accordingly adopts as final the rule set forth in the Order herein.

Hearing Record

Union owns and operates a petroleum cracking refinery located in Lemont, Will County, Illinois which has a rated capacity of 154,000 barrels of crude oil per day. Some of the oil used is sour crude which is high in nitrogen content and which contributes to the high ammonia nitrogen levels in wastewater discharge. The record does not contain the percentage of Union's crude feedstock which could be classified as sour. The refinery draws from and discharges to the Chicago Sanitary and Ship Canal (Canal), a secondary contact stream, pursuant to NPDES Permit No. 0001589. Discharge is at river mile 296.5 which is 5.5 miles upstream of the Lockport Lock and Dam and 20 miles downstream of the Metropolitan Sanitary District of Greater Chicago's (MSD) West-Southwest and Calumet wastewater treatment plants (R. 75). After treatment in Union's wastewater treatment plant (WWTP), approximately 3.3 million gallons per day (MGD) of process wastewater and contaminated surface runoff are discharged. The WWTP consists of primary, secondary and tertiary treatment. Equipment includes a combined flow equalization and storm basin, two API separators, a primary clarifier, an activated sludge basin and a polishing pond. In-plant technology includes three sour water strippers, two stripper storage tanks, and the recycling and treating of all cooling water.

Union has been granted five previous variances from the ammonia nitrogen effluent limitation found at Section 304.122(b):

PCB 77-163, September 29, 1977;	27 PCB 511
PCB 78-168, September 21, 1978;	31 PCB 499
PCB 80-124, September 4, 1980;	39 PCB 438
PCB 82-87, October 5, 1982;	49 PCB 43
and December 2, 1982;	50 PCB 57
PCB 84-66, February 20, 1985.	63 PCB 75

The variance in PCB 84-66 imposed a monthly average ammonia nitrogen effluent limitation of 625 lbs/day and a daily maximum of 1,160 lbs/day based on Union's expectation that its expanded delayed coker unit and its new needle coker complex would increase the ammonia nitrogen of its effluent by 73 lbs/day under specified process conditions (PCB 84-66, February 20, 1985 slip op. at 2). For comparison purposes, 625 lbs/day is approximately 23.4 mg/l (R. 60).

A Union witness testified regarding the best available technology economically achievable (BAT) for refinery operations such as that at Union Oil. According to him, the USEPA defined a model plant which includes in-plant and end-of-pipe treatment. In-plant controls were sour water strippers, elimination of once-through barometric condenser water, segregation of sewers and elimination of once-through cooling water. End-of-pipe treatment

includes flow equalization, preliminary oil and solids removal (primary clarifier), biological treatment and polishing (Exh. 9 at 3,4). The witness testified that the Union refinery has all of these controls. In addition it has programs to minimize water usage, provide air cooling, has extensive stripping and provides thermal oxidation of stripper bottoms. While USEPA model plant sour water strippers were defined as providing ammonia removals of greater than 85 percent, Union represents that its combined long-term removal for the strippers averages 93 percent with monthly averages typically greater than 90 percent. Union claims it now currently exceeds the BAT requirements (Exh. 9 at 5).

As a part of its pollution control effort, Union uses water conservation. A 16 million gallon polishing lagoon which also serves as a holding lagoon provides the refinery with fire protection water when needed. The holding lagoon reduces the amount of water in Union's discharge. While under BAT guidelines it could discharge 42 gallons of water per barrel of crude refined, Union discharges only 28 gallons per barrel (Exh. 8 at 2-13). Of these 28 gallons, Union estimates that 6 gallons per barrel are from stormwater flows. Id. Union's current plant refines three times as much oil as its retired Lemont plant and uses one-twentieth as much water (R. 14).

This water conservation effort by Union in a sense penalizes it. While the federal BAT standards are based on mass loadings of ammonia nitrogen discharged in the effluent (40 CFR 419.23, 1985), the Board's ammonia nitrogen effluent limitation is based on concentration, which is mass per volume. While Union has reduced the volume of water in its discharge, the mass remains constant. Therefore, the mass of ammonia nitrogen is greater per unit of volume after recycling than if Union did not recycle, which in turn raises the concentration (mass/volume) of ammonia nitrogen in the effluent.

Alternative systems to meet the 3 mg/l ammonia nitrogen effluent standard were discussed by Union's consultants in the AWARE Report (Exhibit 8). According to the report:

The technical feasibility evaluation was made using existing plant data, available literature published by the USEPA and American Petroleum Institute, and AWARE's experience. Detailed studies were not undertaken. The information reviewed can only define the potential for ammonia removal and cannot define the long-term reliability of each process to continually discharge less than 3.0 mg/l of ammonia. All processes deemed feasible by this evaluation must undergo detailed testing to define the long-term reliability of the processes performance. (Exh. 8, p. 3-1).

Considered not technically feasible were single-stage activated sludge, single stage activated sludge with mutant bacteria, land application, ozonation, air stripping, and steam stripping (Aware Report at 3-22). Other systems considered which can meet the 3 mg/l ammonia nitrogen standards intermittently but not consistently include: single stage activated sludge with powdered activated carbon (PAC), two stage activated sludge, two stage biological treatment with activated sludge in the first phase and fixed media in the second stage, and ion exchange (Id. at 3-23). These alternatives and another, known as breakpoint chlorination, with their costs and problems are summarized below (from Exh. 8, Table 4-6).

The activated sludge/PAC process has a capital cost of \$3,268,000 and operating and maintenance costs of \$568,000/yr. Needed facility modifications include addition of a 2.0 million gallon aeration basin, installation of new aeration system in existing aeration basin, and installation of a PAC addition facility. Potential problems include lack of proven process reliability, abrasion due to PAC which may require additional equipment modifications and alternate sludge disposal techniques.

The two-stage activated sludge process has a capital cost of \$3,535,000 and operating and maintenance costs of \$216,000/yr. Needed facility modifications include addition of a 0.73 million gallon aeration basin, installation of a new aeration system in existing aeration basin, and the installation of a new 125 foot diameter clarifier. Potential problems include no proven process reliability and poor settling of sludge in the second stage.

The two-stage activated sludge/fixed media process has a capital cost of \$3,195,000 and operating and maintenance costs of \$159,000/yr. Needed facility modifications include installation of a new aeration system in the existing aeration basin and the installation of 5.0 million square feet of RBC media. Potential problems include no proven process reliability.

The ion exchange process has a capital cost of \$10,800,000 and operating and maintenance costs of \$685,000/yr. Needed facility modifications include installation of a granular media filter and the ion exchange system. Potential problems include no proven process reliability, high attrition of exchange media, and organic fouling.

The chlorination/dechlorination (breakpoint chlorination) process has a capital cost of \$1,950,000 and operating and maintenance costs of \$932,000/yr. Needed facility modifications include the installation of the chlorination and dechlorination systems. While it is technically feasible, it may produce toxic chlorinated hydrocarbons and was thus discounted.

The Agency recommended that the request for relief be denied. It pointed out that BAT guidelines are less stringent

than the State's standards. The Agency contends that Union should have spent more effort in identifying the substance which inhibits nitrification and completed a more serious evaluation of adding second stage nitrification facilities. It also pointed out that the nearby 180,000 barrel per day Mobil Oil Joliet Refinery achieves a much higher quality effluent and in 1984 discharged only 58 pounds of ammonia nitrogen per day. The Agency argues that this indicates that Union could do a much better job of removing ammonia. (Agency Brief).

Union summarized its past compliance efforts and costs (Exhibit 1, Tables 2 and 3). The most recent efforts included the use of a sulfide-removing chemical and additional steam to enhance nitrification, full scale trial addition of Sybron/biochemical mutant bacteria to establish a nitrifier population, and the installation of permanent dissolved oxygen analyzers in the aeration basin. The additional steam and bacteria did not increase nitrification (PCB 84-66, February 20, 1985 slip op. at 4). Present design projects include adding hydrogen peroxide to the WWTP and final clarifier modifications. The total capital cost for Union's improvement program between 1977 and 1984 was \$1,023,000 while the total operating cost was \$1,274,000 (Exh. 1, Table 3). This amounts to a combined average of about \$300,000 per year. The Board notes that the nearby Mobil Oil refinery had average operating costs for ammonia reduction projects of \$1,660,000 per year. (Mobil Oil Company v. EPA, 60 PCB 97, at 98, September 20, 1984).

Water Quality

Chicago area wastewaters are collected by the North Shore Channel and channelized sections of the North and South Branches of the Chicago River, subsequently joining the Sanitary and Ship Canal (Canal). The Cal-Sag Channel, which also collects wastewaters, joins the Canal upstream of Union. The Canal ends approximately one mile below the Lockport dam where it empties into the Des Plaines River. The Illinois River is formed at river mile 272.86 at the confluence of the Des Plaines and Kankakee Rivers. It consists of eight navigation pools controlled by seven locks and dams on the waterway and the Alton dam on the Mississippi.

Chicago area wastewaters from three large MSD plants are discharged upstream of Union. The Northside plant discharges to the North Branch of Chicago River, the West-Southwest to the Canal, and the Calumet plant to the Cal-Sag. All Chicago waste and diversion flows are combined at the confluence of the Canal and the Cal-Sag upstream of Union.

Different water quality standards (WQS) apply in the various streams. The Canal and the Des Plaines River from its confluence with the Canal are secondary contact waters up to the I-55 bridge southwest of Joliet. This reach includes the Union refinery. The waters below the I-55 bridge, which include a 17 mile stretch

of the Des Plaines River and the Illinois River are classified as general use waters.

The ammonia nitrogen WQS for secondary contact waters are 2.5 mg/l April through October and 4.0 mg/l November through March (Section 302.407). The dissolved oxygen (DO) WQS for secondary contact water is 4 mg/l (Section 302.405).

The secondary WQS in the Canal for ammonia nitrogen and DO are being exceeded. The ammonia nitrogen secondary WQS is being violated downstream of Union at the Agency's only Canal sampling station, Lockport (Exh. 5, Table 3-1 at 3-4). Union's monitoring of influent ammonia nitrogen at its plant upstream of Lockport shows ammonia nitrogen WQS violations in the Canal (Id., Figure 3-2). Violations of the DO secondary WQS are also occurring at the Lockport station (Id., Table 3-2).

The general use ammonia nitrogen WQS ranges from 1.5 mg/l to 15 mg/l based on temperature and pH (Section 302.212). The general use minimum DO WQS is 5 mg/l, but DO may not be less than 6 mg/l during at least 16 hours of any 24 hour period (Section 302.206). Both the general ammonia nitrogen and DO WQS are sometimes exceeded in the Illinois River (R. 120, Exh. 5 at 3-13, Table 3-5 at 3-14; B-18, Table 3-8 at 3-19, 3-25). Monitoring data generally show compliance with the WQS in the Illinois River. Between 1978 and 1983, however, a DO WQS violation rate of one to three percent existed in the Illinois River (Exh. 4 at 6). For example, Agency data shows one violation at Lacon in 1980 (Exh. 4 at 6, Table 3). During the same 1978 to 1983 period, total ammonia nitrogen WQS violations declined from eleven percent to zero (Exh. 4 at 6). The latest Agency monitoring data show that between January and September 1984 there were no DO or ammonia nitrogen WQS violations in the river. Id.

The Illinois State Water Survey (ISWS) modeling study (Exh. 7) concluded that at 7-day, 10-year low flow conditions there would be DO WQS violations in the Peoria pool of the Illinois River. The modeling study was based on data collected in the summer in 1971, 1972, 1978, and 1979 and based on 1971 and 1980 waste loadings (R. 86; Exh. 7). The minimum modeled DO level in the Illinois River was 3.1 mg/l in the Peoria Pool at river mile 180 (Exh. 4; Table 4). It is expected that this level will increase to 3.7 mg/l once the MSD Calumet plant achieves nitrification. Id.

Using the ISWS model data as a starting point, Union's consultant calculated Union's DO contribution at the Peoria pool during low flow as 0.017 mg/l (Exh. 4, Table 4).

The ammonia nitrogen WQS violations are expected to decline in the Canal and be eliminated in the Illinois River once the MSD's Calumet Treatment Plant achieves an effluent quality of 7 mg/l BOD and 2 mg/l ammonia nitrogen (R. 119-121). This assumption by Union is based on the historical decrease in

ammonia loadings between 1971-1980 (Exh. 5 at 3-25). Whether the ammonia nitrogen WQS will be achieved in the Canal will depend on the degree of nitrification maintained at both the Calumet and WSW treatment plants (R. 120). The Calumet plant is expected to achieve nitrification by January 1987 (Huff letter dated 11-6-85 rec'd 11-21-85).

While the additional nitrification at the Calumet plant should improve the DO concentration of the waterways, violations are expected to continue. As the Illinois State Water Survey pointed out, "the bottom sediments alone will cause significant oxygen depletion in all pools above the Peoria Dam....The SOD [sediment oxygen demand] rates below the Dresden Island Dam will continue to exert ambient demands irrespective of what is done in the Chicago area to eliminate storm overflows or to improve treatment plant efficiencies." (ISWS Contract Report 324, July 1983 as cited at R. 122).

The WQS violations differ in each pool and the causes include sediment oxygen demand, benthic demand and dissolved biochemical oxygen demand. The latter includes the effect of ammonia loading as an oxygen consuming material. The concentration of oxygen in the water also depends on the extent of aeration in each pool.

The impact of Union's discharge on stream biota was also analyzed. By determining the species number and diversity, the stream can be classified as to the extent of pollution.

Grab samples were taken of the Canal bottom at locations upstream and downstream of Union's discharge on two different days (Exh. 5, Table 5-3 at 5-16). The results of the September 8, 1983 sampling revealed tubifex worms present along the near shore of Union's property, both upstream and downstream of Union (Exh. 5 Fig. 5-5 at 5-18). None were found in the middle or at the far shore because of a lack of bottom sediment (the Canal, whose bottom for a great length is bedrock, lacks sediment in places where barge traffic has scoured it clean). The results of an October 7, 1983 sampling included tubifex (sludge) worms, leeches and Chironomid midges above and below Union's discharge in the near shore sediments. The number of each and their location are indicated in Exhibit 5, Table 5-4 (At 5-20).

The tubifex worms were abundant above and below Union's outfall on both days (Fig. 5-5 and 5-6). Given their tolerance to polluted water, their abundance in this segment of the Canal indicates a polluted stream segment (Exh. 5 at 5-15, 5-17, Fig. 5-5).

Another method of stream classification involves use of a diversity index. The October 7 results were used to calculate a Shannon diversity index value of less than 0.16 at each sampling site (Exh. 5, Table 5-4 at 5-20). This indicates a polluted stream segment (Id. at 5-21).

The results of Exhibit 5 are in agreement with the Agency's own benthic studies of 1978, 1979 and 1980 which showed that the waterway is polluted upstream of Union's outfall at approximately the Lockport Lock (Exh. 5 at 5-21). The authors conclude that there is no change in the diversity or the number of organisms due to the effects of Union's discharge.

The concentration of ammonia nitrogen was also sampled during the two benthic sampling days in order to calculate the un-ionized ammonia concentrations which are toxic to fish at certain levels. Un-ionized ammonia concentrations were calculated at a pH of 7.4, 4.0 mg/l ammonia nitrogen, and at temperatures of 21° C and 26° C. At the two temperatures, the un-ionized values were 0.042 mg/l and 0.060 mg/l, respectively. Reviewing another study, the authors conclude that these levels would not be acutely toxic to carp, noting that the above calculated un-ionized values occur after the mixing area of less than 100 feet downstream of Union's discharge (Exh. 5 at 5-22).

The authors of Exhibit 5 did not perform actual fish population counts. They did rely on a 1974 MSD fish study wherein carp, goldfish and a green sunfish were caught downstream of Union's outfall at the Lockport Lock and Dam (Exh. 5 at 5-21). Eleven miles upstream of Union's outfall between Laramie Avenue and Willow Springs Road there were no fish. Id. The authors conclude that the lack of fish diversity indicated by the MSD study is a result of the physical features of the Canal, the lack of spawning habitat and the low DO levels in the Canal. Id.

Effluent Standard Relief

Union offers three main reasons why it cannot at this time comply with the 3 mg/l ammonia nitrogen effluent standard. First, its water conservation practices contribute to higher concentrations of ammonia nitrogen in its discharges, although the pound loadings remain constant (R. 24-5). Therefore, using a concentration limitation instead of a mass limitation penalizes Union. The Board notes that Union would be in violation even if it did not conserve water. Second, the increase in use of sour crudes, those with high sulfur and nitrogen contents, will increase the ammonia nitrogen in the effluent (Exh. 1, Fig. 1; R. 169-70). Union noted that since 1979 the nitrogen content of its crude oil has doubled (R. 16). The increased use of sour crudes appears to be an industry trend (Id., Attach. 1; R. 16-17). Third, the WWTP is only accomplishing sporadic nitrification due to an inhibitory effect of an unknown substance or substances on the nitrifying bacteria population (R. 150, 168, 42-3; See 164-166). While some attempts have been made to identify the substance or substances, they have not been identified (R. 40-1). Union asserts that no technically feasible alternatives which are also economically reasonable have been shown to exist.

The Board finds that the existence of an alternative that can consistently meet the 3 mg/l ammonia nitrogen effluent standard at Union which is technically feasible and economically reasonable is not apparent based on the record. The evidence does show that there are alternatives available which would approach this goal. Additionally, the Board notes that the current impact of Union's discharge on the waterway is minimal.

The Board will grant Union relief from the ammonia nitrogen effluent standard located at 35 Ill. Adm. Code 304.122(b). Union will have to meet the BAT limitations at 40 CFR 419.23 for ammonia nitrogen.

Water Quality Standard Relief

Union has requested relief from the DO WQS through the operation of 35 Ill. Adm. Code 304.105 (R. 9-11) in the event that the Board determines that Union causes or contributes to a DO violation downstream in the Peoria pool of the Illinois River (Pet's Memorandum at 4,5). The issue of whether relief is needed stems from the ISWS modeling study of DO concentrations in the Illinois River at 7-day, 10-year low flow conditions, discussed above. The Agency contends that the general use ammonia nitrogen WQS of Section 302.212 and the secondary contact ammonia nitrogen WQS of Section 302.407 also apply to this proceeding (Agency Brief at 4).

The Board agrees that in the theoretical situation described, Union would arguably be contributing to the modeled DO violation at low flow in the Peoria pool of the Illinois River. However, Union's contribution to this theoretical violation is de minimus. No relief is needed at this time. This applies only to the Peoria Pool DO model violation and shall not be construed as applying to any other existing or potential WQ violation. Theoretically, any upstream ammonia nitrogen discharge contributes to that DO violation. The Board will consider actual violation on a case by case basis. For the Board to rule otherwise would trigger a mass of variance and site-specific requests for relief from theoretical WQS violations.

Even if one assumes that WQS relief is necessary in this situation, the mention of that possibility occurred at hearing and in briefs. There was no adequate public notice of an intention to change a WQS pursuant to 40 CFR 131.20(b) (1985). The relief in this proceeding will be confined to the effluent discharge.

Conclusion

The First Notice proposed rule granted relief and proposed that the rule terminate on December 31, 1995. Comments received during the First Notice period will be addressed below.

Union objected to the rule terminating the rule at a certain future date. It contended that it had adequately made a case for permanent relief, that it is not a major contributor to the waterways pollution load, and that other factors such as agriculture, the MSD and potential diversions from Lake Michigan can all have a significant effect on the attainment of water quality goals. Union also asked the Board to delete or in the alternative modify subsections (d), which required continued efforts to reduce the ammonia nitrogen concentration and monthly reporting, and (e) which required reporting of the ammonia nitrogen content of its feedstocks reported on a monthly basis.

The Agency again argued that the Illinois technology based standard should not be replaced in this instance by the less stringent Federal BAT limitations:

The Agency's previously stated position emphasizes that while a technology-based standard may seem burdensome to isolated and individual dischargers, and of seemingly dubious benefit to water quality, it is nonetheless appropriate in the specific context of this regulatory scheme. The fact that Section 304.122(b) is more stringent than BAT guidelines cannot be considered as justification for granting relief therefrom. The water quality of the Illinois River system is affected by far too many dischargers to detect and quantify the impacts attributable to individual dischargers even though such may contribute substantial loadings. (Agency Comments at 2).

The Agency also requested that, "a legitimate evaluation of two-stage biological nitrification, preferably including a pilot study, should be required during the 'sunset' period if relief is granted." (Id.) The Agency also suggested that the sunset period should be shortened and include review of existing rather than new technology. The Agency objected to any inference that it has the burden to dispute or discredit a regulatory proposal. The Agency concluded by recommending a more limited level of relief than that proposed at First Notice. (Id.)

The USEPA review comments concluded that the "sunset" provision "appears appropriate", and that granting relief would not appear to "result in significant influence with respect to acute or chronic water quality criteria." The comments included the following statement:

Because the technology-based standard is clearly more stringent than BAT and appears more stringent than dictated by water quality concerns, applicability is appropriately a State decision. The philosophy and rationale

for applying the technology-based limitation is adequately and appropriately presented by the Illinois Environmental Protection Agency (IEPA) in the Board record.

The Board believes that in certain situations site specific rules should terminate or "sunset" at a date certain. The Board first proposed such a sunset provision in its First Notice Opinion and Order of In re Sanitary District of Decatur, R85-15, January 23, 1986. Although the Second Notice Opinion and Order did not retain the sunset provision, the Board found that it did have the authority to impose such a provision. This authority stems from the broad rulemaking power granted to the Board by Section 27(a) of the Act. In its Second Notice Opinion the Board stated:

[S]unsetting may prudently be viewed as within the scope of Board authority to make different provisions as required by circumstances for different contaminant sources and for different geographical areas. Therefore, the Board determines that it presently does have authority to promulgate sunset provisions in rulemakings, as circumstances may warrant.

Second Notice Opinion, In re Sanitary District of Decatur, R85-15, slip op. at 6, April 10, 1986.

In addition, the Board stated that its defined role under the Act allows for the imposition of a provision which terminates a regulation on a particular date. Quoting Section 5(b) of the Act, the Board stated that the Board "is the entity in Illinois to 'determine, define and implement' environmental control regulations." The Board concluded that since "the relief could only emanate from the Board initially, it is appropriate that the Board determine the continuing validity of that relief in the future." Id. at 7. A sunset provision is merely the product of such a determination.

The Board will retain the sunset provision in this rule for a number of reasons which taken together make permanent relief at this time inappropriate. The water quality of the receiving stream is expected to change in the near future. This change is expected to occur after the MSD Calumet plant achieves nitrification in 1987 and as a result of the TARP project. Union's output of ammonia nitrogen per unit of production is expected to vary considerably over time as it utilizes feedstocks from different parts of the world in response to the turbulent oil market. At the end of the sunset period, it may be possible to more accurately predict the sources of crude oil the plant will utilize and frame a rule accordingly. The BAT limitation can change as processes are added or deleted at a facility. The

sunset provision will allow review of any such changes in a timely manner. In addition, the Board believes that, given some effort, Union can improve its effluent quality. Granting permanent relief would remove any incentive for such efforts. Union at hearing made it clear that it would take no substantial steps to decrease its ammonia nitrogen discharge if relief is granted (R. 53, 54, 61). The Aware Report's evaluation of alternatives was not detailed enough to conclusively rule out all alternatives. More detailed testing would be required for such a determination. Existing technology can significantly reduce the discharge even if it cannot consistently meet the standard. These factors taken together suggest that the conditions present today will almost certainly be changing in the foreseeable future and that the rule should have a built-in provision for review. Based on the record, the Board at this time is not willing to accept the current level of performance as suitable for permanent relief.

The rule will terminate on December 31, 1993 rather than the 1995 date proposed at First Notice. This is consistent with the Agency's request that relief be more limited. The Board believes that this will give the MSD adequate time to bring its Calumet improvements on line and debug them. The remaining time will allow the river to respond to the changes implemented by MSD and for Union to investigate ways to improve its effluent quality. At that time, the Board will be able to better evaluate the appropriateness of a permanent rule. Subsections (d) and (e) are modified to take into account Union's statement that the reporting was too frequent and a new (f) is added for the same reason. The monitoring and reporting requirements for ammonia nitrogen can be more appropriately addressed in the permit. Subsection (e) is corrected by replacing the word "ammonia" with "nitrogen".

The Board notes that Union's estimate that its BAT limitation is 775 lbs/day monthly average appears to be based on the plant's maximum practical capacity. Forty CFR 122.45 (b) (2) (1985) specifies that "calculation of any permit limitations, standards, or prohibitions which are based on production (or other measures of operation) shall be based not upon the designed production capacity but rather upon a reasonable measure of actual production of the facility." In accordance with this provision, the Board expects any permit issued to Union by the Agency to take into account the variability of actual production. One way of achieving this would be to specify maximum limitations for increments of 10 to 20 thousand barrels per day of production over monthly periods. While Union's capacity is about 155,000 barrels per day its production between 1979 and 1983 averaged 120,000 barrels per day and was between 80 and 100,000 for months at a time (AWARE Report, Table 2-3).

The Board does not necessarily agree with the sweeping assertions contained on page 2 of Union's comments on First Notice. As noted in the First Notice opinion, the Board is aware

that the Sanitary and Ship Canal and Illinois River have a number of pollution problems. The Board agrees with the Agency that these problems are serious and that existing poor water quality should not be used to justify additional or continued long-term pollution even by seemingly small sources. In the instant proceeding the Board has determined that given the overall situation the Union discharge of ammonia nitrogen at BAT levels will cause minimal additional environmental harm over the term of this rule. That Union's ammonia nitrogen discharge is not "measurable" or readily distinguishable from the discharge of other sources at downstream locations does not change the fact that it is an undesirable addition to the aquatic ecosystem. The waterways must be cleaned up to provide a suitable medium for diverse populations of aquatic life. The Board notes that the water quality of the waterways has been improving over the years, and intends that trend to continue.

The Board agrees that the Agency is not required to dispute or discredit a regulatory proposal. A proposal is to rise or fall on the strength or weakness of the record in the proceeding. In this proceeding, however, the Agency has suggested that the Board compare Union's performance with that of Mobil Oil Company, but provides little information other than that the plants are apparently similarly situated and Mobil very nearly meets the standard. The record does not contain factual information about the design, equipment, processes and feedstocks that would provide the Board with a basis for a valid comparison. The Board is aware that the Agency has limited resources, but again emphasizes the need for participants to place their concerns and information into the record in a form suitable for use in reaching a decision.

ORDER

The Board hereby directs the Clerk to cause the filing of the following final, adopted rule with the Secretary of State.

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

PART 304
 EFFLUENT STANDARDS

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

Section 304.213 Union Oil Refinery Ammonia Discharge

- a) This Section applies to discharges from Union Oil Company of California's Chicago Refinery, located in Lemont into the Chicago Sanitary and Ship Canal.

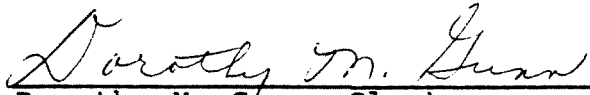
- b) The requirements of Section 304.122(b) shall not apply to the discharge. Instead Union must meet applicable Best Available Technology Economically Achievable (BAT) limitations pursuant to 40 CFR 419.23 (1985) incorporated by reference in subsection (c).
- c) The Board incorporates by reference 40 CFR 419.23 (1985) only as it relates to ammonia nitrogen as N. This incorporation includes no subsequent amendments or editions.
- d) Union shall continue its efforts to reduce the concentration of ammonia nitrogen in its wastewaters.
- e) Union shall monitor the nitrogen concentration of its oil feedstocks and report on an annual basis such concentrations to the Agency.
- f) Union shall submit the reports described in subsection (e) no later than 30 days after the end of a calendar year.
- g) The provisions of this Section shall terminate on December 31, 1993.

(Source: Added at 11 Ill. Reg. _____,
effective _____)

IT IS SO ORDERED.

B. Forcade dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Opinion and Order was adopted on the 19th day of March, 1987 by a vote of 5-1.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board