ILLINOIS POLLUTION CONTROL BOARD
October 7, 1993

IN THE MATTER OF:	)	
	)	
MARATHON OIL COMPANY'S PETITION	)	R91-23
FOR SITE-SPECIFIC RULE CHANGE TO	)	(Rulemaking)
35 ILL. ADM. CODE 303.323	)	

Proposed Rule. First Notice.

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

On August 19, 1991 Marathon Oil Company (Marathon) filed this proposal for site-specific rulemaking. Marathon seeks to amend the limits contained in the current site-specific rule at 35 Ill. Adm. Code 303.323 pertaining to chlorides.

The Board's responsibility in this matter arises from the Illinois Environmental Protection Act (Act) (415 ILCS 5/1 et seq. (1992)). The Board is charged therein to "determine, define and implement the environmental control standards applicable in the State of Illinois"[1]. 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, whereas the Illinois Environmental Protection Agency (Agency) is responsible for carrying out the principal administrative duties. The latter's duties include administering any regulation that may result from action in the instant proceeding.

A petition for variance, docket PCB 91-173, was filed by Marathon on September 17, 1991 involving the same facility and discharge. That petition is currently before the Board on remand from the appellate court[2]. On December 19, 1991 the Board granted Marathon's motion to incorporate the record of the variance proceeding into this proceeding[3,4]. Hearing was held

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[1] Act at Section 5(b).

[2] Marathon Oil Company v. IEPA and PCB (5th Dist. 1993), 242 Ill.App.3d 200, 610 N.E.2d 789, 182 Ill. Dec. 920. See also the Board's opinion and order of this date in PCB 91-173.

[3] In the Matter of: Marathon Oil Company Site Specific (December 19, 1991), R91-23, 128 PCB 899.

before hearing officer Karen Rosenwinkel on this site-specific petition on September 10, 1992 in Robinson, Illinois. No members of the public attended. Briefs were filed by petitioner on April 12, 1993 and respondent on May 17, 1993.

Today the Board proposes for first notice an amended version of Marathon's proposal. The Board notes that pursuant to the Illinois Administrative Procedure Act (5 ILCS 100/1-1 et seq. (1992)) interested persons will have 45 days from publication of this proposed amendment in the Illinois register to file public comments[5]. The Board further notes that since it has been nearly one year since the close of the hearing record, interested persons filing comments should update the Board on developments that have affected this matter since the closing of the hearing record.

REGULATORY HISTORY

The Board's general effluent regulations do not include a specific limitation for chloride. However, they do prohibit any discharge that would cause or contribute to a violation of a water quality standard. (35 Ill. Adm. Code 304.105.) The pertinent water quality standard for chloride is the 500 mg/L General Use Water Quality Standard found at 35 Ill. Adm. Code 302.304.

Marathon initially petitioned this Board for temporary exemption of its receiving waters from the 500 mg/L water quality standard in PCB 80-102. On October 2, 1980 the Board granted this petition for variance, under condition that chloride effluent concentrations not exceed 700 mg/L, effective through October 2, 1985.

In PCB 85-83 Marathon petitioned for extension of the PCB 80-102 variance with respect to chloride. On January 23, 1986 this petition was granted effective for the period October 2, 1985 through October 2, 1990.

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[4] Citations to the record will indicate transcript references as "Tr.", petition as "Pet.", exhibits as "Pet. Exh." or "Resp. Exh.", and briefs as "Pet. Br." or "Resp. Br.". Citations to the site-specific and variances records will be distinguished where necessary by prefacing the citations with "SS" for the site-specific record and "V" for the variance record; e.g., "SSPet. at XX."

[5] See hearing officer order of this date for filing particulars.

On January 28, 1987 Marathon filed a site-specific rulemaking petition seeking, among other matters, to make permanent its exemption from causing or contributing to violations of the 500 mg/L water quality standard under the continuing provision that its effluent discharge not exceed 700 mg/L. On September 13, 1989[6] the Board responded to Marathon's petition by promulgating a new rule at 35 Ill. Adm. Code 303.323. The new rule generally tracked Marathon's proposal, except that the Board added a 550 mg/L limit on in-stream chloride concentrations as recommended by the Agency. Accordingly, the currently applicable rule is as follows:

> Section 303.323 Sugar Creek and Its Unnamed Tributary
>
> a) This Section applies only to Sugar Creek and its unnamed tributary from the point at which Marathon Petroleum[7] Company's outfall 001 discharges into the unnamed tributary to the confluence of Sugar Creek and the Wabash River.
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> b) 35 Ill. Adm. Code 304.105 shall not apply to total dissolved solids and chlorides discharged by Marathon Petroleum Company's Outfall 001, so long as both of the following conditions are true:
>
> 1) Effluent from Marathon Petroleum Company's Outfall 001 does not exceed 3,000 mg/l total dissolved solids or 700 mg/l chlorides,
>
> 2) The water in the unnamed tributary does not exceed 2,000 mg/l total dissolved solids or 550 mg/l chlorides.

On August 19, 1991 Marathon filed this site-specific rulemaking proposal, seeking to amend the chloride provisions of Section 303.323. The new proposal would increase the effluent chloride limitation from 700 mg/L to 1000 mg/L and the chloride water quality standard from 550 mg/L to 700 mg/L.

As stated earlier, on September 17, 1991 Marathon filed a petition for variance, docket PCB 91-173. In that proposal

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[6] In the Matter of: Marathon Petroleum Company Site-Specific, R87-2, 103 PCB 133.

[7] Marathon Oil Company is the successor in interest to Marathon Petroleum Company (VResp. brief at 1).

Marathon requests as variance conditions the same 1000 mg/L and 700 mg/L effluent and water quality limitations that it proposes as amendments to Section 303.323. Therefore, Marathon now seeks to make permanent the relief requested in the variance.

FACILITY DESCRIPTION

Marathon operates a petroleum refinery located on the outskirts of the City of Robinson, Crawford County, Illinois. The refinery processes some 205,000[8] barrels of oil per day and employs approximately 650 persons (SSPet. 1-2.)

Part of the refining process consists of removing chloride mixed with water from the crude oil. The quantity of chloride in the crude oil varies depending upon the nature of the pore fluids in the source rocks of the crude oil and the history of recovery, transportation, and storage of the crude oil. Because the Marathon facility receives crude oil from different sources, the chloride content of the crude processed at the facility likewise differs. Since 1988 the chloride content has varied on a monthly-average basis from a low of 29.2 pounds per million barrels to 104.5 pounds per million barrels; in the first ten months of 1991 chloride contents ranged from an average of 48.5 to 88.7 pounds per million barrels (VPet. Exh. 8.)

Marathon treats its wastewaters prior to discharging them. However, the treatment is not capable of producing significant reduction in chlorides. Marathon is in the process of designing an upgraded treatment facility that would allow it to increase treatment capacity, but this too would have only marginal effect on chloride discharge concentrations and does not contain any specific technology to remove chlorides (VTr. at 25-27.) The effluent chloride that the plant discharges is basically dependent on the salt content in the crude oil and the amount of water discharged to the creek. (SSTr. at 8.)

Discharge of the wastewaters is to an unnamed[9] tributary of Sugar Creek at approximately mile 5.0 of the unnamed tributary; Sugar Creek thence flows approximately five miles more to its mouth on the Wabash River (SSPet. 2, Attachment A; VPet. Exh. 1 at 8.)

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[8] The record contains different figures for the amount of crude processed per day at this facility. The figures range from 170,000 to 205,000 barrels per day. (SSPet. 1-2; VTr. 11; SSTr. 6, 23, 36; SSPet. Exh. A-1)

[9] Although not officially named, the creek is sometimes referred to as Robinson Creek (e.g., VPet. Exh., p. 6).

The unnamed tributary at the Marathon discharge has a drainage area of approximately eight square miles (VTr. at 15) and a natural 7-day 10-year low flow of zero (VTr. at 22). However, actual low flow in the unnamed tributary is controlled by wastewater and other manmade discharges. These include discharges located upstream from Marathon's discharge that aggregate an average of approximately 1.4 million gallons per day (MGD[10]) (SSPet. Exh. 1 at A3, VTr. at 15-6), of which the discharge of the City of Robinson's sewage treatment plant at 1.2 MGD is the largest. Marathon itself discharges an average of another 1.4 MGD, such that the low flow is approximately doubled due to Marathon's discharge.

TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

Compliance Efforts

Over the years Marathon has examined different treatment alternatives for chloride, including concentrating the chloride, removing it, and disposing of it underground by injection or in a dried form in landfills. Marathon has also examined transporting the effluent to a larger water body via pipeline and discharging it. Marathon argues that none of these alternatives is technically feasible or economically reasonable. (SSTr. at 8-9.)

Marathon currently uses storing techniques employing storm water impoundments. The storage process is described as total diversion of the effluent from the wastewater plant to storm water basins with later treatment of both collected stormwater and already once-treated, diverted effluent. Discharges from the plant are resumed again during periods of higher flow. (SSTr. at 10-11.)

Marathon maintains that the storage option, while technically feasible, does not work during periods where high chloride content in crude and storm events coincide. Marathon offers that preventing discharge that exceeds the limits is increasingly harder to maintain during such storm events. Furthermore, Marathon presents that the potential for discharging effluent that exceeds the limits will increase due to additional planned changes in the operation of the storm water diversion system.

Marathon intends to divert storm water out of the ponds, close the ponds, and replace them with tanks. This would result in a diminished amount of water to dilute the effluent from the treatment plant. The amount of dilution water is diminished

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[10] One MGD equals 0.04381 cubic meters per second or 1.55 cubic feet per second (cfs).

because certain storm water runoff is not considered contaminated and is no longer to be diverted to be mixed with the contaminated storm water runoff. (SSTr. at 11-13.) The closure of the ponds may be necessary due to potential groundwater contamination and cleanup due to other contaminants present in the pond sediment (SSTr. at 67.)

ENVIRONMENTAL IMPACT

The environmental impact issues are twofold. One question involves Marathon's position, acceded to by the Agency, that the continued use of the current management practices, especially in light of the planned changes to the treatment plant, may result in a negative impact on the receiving waters. The second consideration consists of an unknown toxicity problem present in Marathon's effluent, and the Agency's concerns that increased chloride may additionally burden an already stressed aquatic population.

Storage Impacts

Marathon presents that the storage option of controlling chloride levels in the plant effluent, discussed above, has a potential negative environmental impact on the stream due to the greater chance of overflow during certain storm events. Marathon further states that the use of all the storm water retained in the ponds to dilute the chloride has historically resulted in greater swings in the concentration of chloride discharged, which Marathon believes is not beneficial to the fish population. (SSTr. at 70.)

The Agency basically concurs with Marathon's assessment of the environmental impact of the currently-employed management techniques, as described in the testimony of Dean Studer:

> Although unable to determine at this time if discharging a "more continuous but higher level of chlorides in the stream" is any less stressful [on the fish population], the Agency does believe that raising the water quality standard for chlorides in the receiving stream to allow Marathon to continually discharge effluent from outfall #001 is environmentally prudent. Such a change in the chloride water quality standard would minimize the potential stress from the cyclic changes in flow and water quality resulting from the alternating cessation and commencing of discharge. * * * Given the nature of the receiving stream and the unknown toxicity problem, if an emergency bypass were to occur, it is possible that the discharge would contribute to the degradation of the receiving stream. (SSExh. 4 at 7.)

Unknown Toxicity Problem

The unnamed tributary in question has been the subject of previous study. Marathon's environmental consultant, Radian Corporation, performed a study of the receiving stream in 1986, finding that, while there were no fish for a distance below the Marathon outfall, the water quality and stream sediment quality had improved since a study done in 1976 by the Agency. (VTr. at 47; VPet. Exhs. 1,2.) A study was also undertaken by the Agency in 1986 and published in 1988. (VPet. Exh. 1.) Marathon believes that the Agency's study reaches the same basic conclusions as the Radian Corporation study.

There are differences between the studies, mainly in scope, as the Agency study encompassed general stream quality while the Marathon study was limited to the Marathon discharge. (VTr. at 45-46.) In 1991, the Agency performed a survey of the fishes of the Sugar Creek Basin in the proximity of the Marathon discharge and some found improvement in the fish population since the two 1986 studies, as well as a lack of toxicity in the stream sediment. (VResp. Exh. 1.) The Agency reported fishless conditions for four (4) miles downstream of the Marathon outfall and concluded that "it seems very likely that the continued effluent toxicity from Marathon is the cause of impacts on the fish community". (Id.)

The 1991 study as well as the 1986 studies show that there continues to be an effect downstream of the Marathon discharge that is limiting or reducing the number of fish in the Sugar Creek Basin area. (VTr. at 49-50; VResp. Exh. 1.) As Robert Wallace, of Radian Corporation testified:

> [T]he [Agency] and, for that matter, Marathon, are at a loss to explain the stream degradation that is apparent from observation of the biological community in the stream, and there is some frustration on both sides because it can't be clearly shown what's causing it. Whether it's something in the discharge or not, we don't have identification of a chemical that's causing the observed toxicity. (VTr. at 50.)

Degradation was also attributed to the City of Robinson sewage treatment plant effluent, but there has been improvement downstream from that plant. (SSPetition at C 1-4, 2-2.)

Effects of Higher Chloride Concentration

Marathon presented two recent studies prepared by its consultant, Radian Corporation, Marathon Oil Company Chloride Study of Robinson Creek, August 1992 (SSExh. 3), and Marathon Oil Company 7-Day Chronic Fathead Minnow-Larval Survival and Growth Test, July 1992 (SSExh. 2.) Based on these studies, Marathon's

witness, Robert C. Wallace concluded that "[t]he results of these studies indicate that a chloride limitation of 1600 mg/L in the effluent would result in an instream chloride concentration at low flow of less than 1,000 mg/L, a level shown to be non-toxic to aquatic life". (SS.Exh. 1 at 1.) The chronic toxicity test results are summarized as follows:

> A 7-day chronic fathead minnow test was conducted on synthetic effluent chloride levels of 700, 800, 900, and 1,000 mg/L while holding total dissolved solids (TDS) constant at 2,000 mg/L.
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> Results of the chronic toxicity test indicated that chloride concentrations up to 1,000 mg/L, the highest level tested, had no significant negative effect on fish survival. Larval survival in all chloride test solutions was greater than or equal to 93 percent. Biomass was higher in all chloride test solutions than in control groups. The no-observed effect concentration (NOEC) for the test was 1,000 mg/L chloride and the percent impairment concentration (IC25) was greater than 1,000 mg/L chloride. This would indicate that 1,000 mg/L chloride and 2,000 mg/L TDS do not produce toxicity to larval fathead minnows and should not be toxic to aquatic life in Robinson Creek. (SSExh. 2 at 1-1.)

The Agency does not dispute the results of these studies, *per se*, but rather continues to assert its position that the chlorides may constitute a stress factor:

> The Agency is concerned that raising the chloride water quality standard too high will stress the aquatic biota and exacerbate the existing toxicity problems in the waters below Marathon's outfall. Further, with the existing chronic toxicity problem in Marathon's effluent, any toxicity tests for chloride will be biased. Therefore, the only way to measure the effects due strictly to chloride is to use a synthetic effluent in toxicity testing. This technique, being the sole option open to petitioner for chloride toxicity testing at this time, was employed by petitioner in support of this proposal. This process, through its very nature, ignores the interaction of elevated chloride levels with the existing toxicity in Marathon's effluent and introduces a decree (sic) of bias in the results. (SSExh. 4 at 4.)

The Agency goes on to state that it believes that in all probability, this bias in the testing will increase as the chloride levels go higher; therefore, the Agency is skeptical of the toxicity results. (SSExh. 4 at 4-5.)

Parties' Positions

The Agency agrees that site-specific relief for chloride is necessary. However due to the toxicity problem, the Agency believes that the relief should be temporary, and that a toxicity reduction evaluation (TRE) should be required. Marathon is opposed to temporary relief in this site-specific rulemaking because of the time and effort that would be needed to complete another rulemaking in the future. Marathon also disagrees that a TRE should be required as a condition of the requested relief, pointing out that TRE's are usually imposed by the Agency in the course of the grant of an NPDES permit. (VPet. status report. at 3; see also, SSTr. at 50.)

CONCLUSIONS

The Board is persuaded, based upon an analysis of the record in this proceeding, that there is no alternative treatment method for Marathon that is simultaneously technically feasible and economically reasonable. The Board is also persuaded that the increase in chloride in Marathon's effluent as proposed here, is not a known limiting factor in the quality of the receiving waterway. Accordingly, the Board will today propose for first notice a rule which would provide the relief requested, as modified to comport with Administrative Code Division requirements.

The Board emphasizes that it shares the Agency's concern over the toxicity in the unnamed tributary. This toxicity needs to be characterized and eliminated. The toxicity issue would seem to be appropriately addressed in the NPDES permitting process. There the nature of the effluent in all its water quality aspects (including its possible toxicity) is a relevant concern[11].

The Board also notes that its support of Marathon's proposed amendment is predicated on the belief that chloride at the concentrations proposed is not a known notable contributor to degraded aquatic conditions in the unnamed tributary. Any evidence that would cause an opposite conclusion to be drawn at any time in the future would be grounds to reverse this support.

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[11] The Board notes that it is not prejudging the imposition of TRE's in the pending permit appeal, PCB 92-166, but only states that the issues are better raised in the permit context.

ORDER

The Board directs the Clerk of the Board to cause first notice publication of the following amendments in the Illinois Register.

Section 303.323 Sugar Creek and Its Unnamed Tributary

a) This Section applies only to Sugar Creek and its unnamed tributary from the point at which Marathon ~~Petroleum~~ Oil Company's outfall 001 discharges into the unnamed tributary to the confluence of Sugar Creek and the Wabash River.

b) 35 Ill. Adm. Code 304.105 shall not apply to total dissolved solids and chlorides discharged by Marathon ~~Petroleum~~ Oil Company's outfall 001, so long as both of the following conditions are ~~true~~ met:

1) Effluent from Marathon ~~Petroleum~~ Oil Company's outfall 001 does not exceed 3,000 mg/~~l~~L total dissolved solids or ~~700~~ 1,000 mg/~~l~~L chlorides, and

2) The water in the named tributary does not exceed 2,000 mg/~~l~~L total dissolved solids or ~~550~~ 750 mg/~~l~~L chlorides.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 7th day of October, 1993, by a vote of 7-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board