

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PROPOSED ADJUSTED STANDARD FROM)
AMMONIA NITROGEN DISCHARGE LEVELS AT)
35 Ill. Adm. Code 304.122 FOR CITGO PETROLEUM)
AND PDV MIDWEST REFINING, L.L.C.)

AS 2008-008
(Adjusted Standard)

RECEIVED
CLERK'S OFFICE

JUN 23 2008

STATE OF ILLINOIS
Pollution Control Board

ORIGINAL

NOTICE OF FILING

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PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the attached **AGENCY'S RECOMMENDATION** of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

BY: 
Sanjay K. Sofat, Assistant Counsel

Dated: June 20, 2008
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35 Ill. Adm. Code 304.122 FOR CITGO PETROLEUM)
AND PDV MIDWEST REFINING, L.L.C.)

**RECOMMENDATION OF THE ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY**

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA" or "Agency") by one of its attorneys, Sanjay K. Sofat, in response to the Petition for adjusted standard of CITGO Petroleum Corporation and PDV Midwest Refining, LLC (Hereafter, referred to jointly as "CITGO" or "Petitioner") from 35 Ill. Adm. Code 304.122(b) and pursuant to 35 Ill. Adm. Code 104.416, hereby recommends that the Pollution Control Board ("PCB" or "Board") **DENY** CITGO's request, as outlined in the petition. Specifically, the Agency recommends that the Board deny CITGO's request because it has not met its burden under Section 28.1(c) of the Illinois Environmental Protection Act ("Act") and the Board regulations. In support of its recommendation, the Illinois EPA states as follows:

I. INTRODUCTION

1. On March 18, 2008, CITGO filed an adjusted standard petition with the Board seeking relief from 35 Ill. Adm. Code 304.122, which requires that ammonia nitrogen discharges into the Chicago River System be limited to 3 milligrams per liter ("mg/L") as a monthly

average. Section 304.122 of the Board regulations applies to the CITGO's discharge from the petroleum refinery located at 135th Street and New Avenue in Lemont, Will County, Illinois.

2. On April 3, 2008, CITGO filed a Certificate of Publication with the Board pursuant to 415 ILCS 5/28.1(d)(2006) and 35 Ill. Adm. Code 104.408 and 104.410 certifying that notice of its adjusted standard petition was published in the GateHouse Media Suburban Newspapers in Lemont on March 21, 2008.

3. Illinois EPA is required to file a Recommendation with the Board within 45 days of the filing of a petition for adjusted standard or within 30 days before a scheduled hearing date, whichever occurs earlier. *See* 35 Ill. Adm. Code 104.416.

4. On May 7, 2008, the Illinois EPA filed a Motion for Extension of Time to File Recommendation requesting extension of the deadline to file its recommendation by 30 days. The Board granted this request on May 15, 2008.

5. On May 30, 2008, the Illinois EPA filed another Motion for Extension of Time to File the Agency's Recommendation requesting additional 14 days to file. In a June 3, 2008 order, the Hearing Officer granted the Illinois EPA's request for additional time to file its recommendation.

II. STATEMENT OF STANDARD OF GENERAL APPLICABILITY FROM WHICH PETITIONER SEEKS AN ADJUSTED STANDARD

6. Petitioner has requested an adjusted standard from 35 Ill. Adm. Code 304.122(b), limiting ammonia effluent for large dischargers to specified water bodies, including the Illinois River. The requirements of ammonia effluent limitations contained in Section 304.122 provide as follows:

Section 304.122 Total Ammonia Nitrogen (as N: STORET number 00610)

- a) No effluent from any source which discharges to the Illinois River, the Des Plaines River downstream of its confluence with the Chicago River System or the Calumet River System, and whose untreated waste load is 50,000 or more population equivalents shall contain more than 2.5 mg/L of total ammonia nitrogen as N during the months of April through October, or 4 mg/L at other times.
- b) Sources discharging to any of the above waters and whose untreated waste load cannot be computed on a population equivalent basis comparable to that used for municipal waste treatment plants and whose total ammonia nitrogen as N discharge exceeds 45.4 kg/day (100 pounds per day) shall not discharge an effluent of more than 3.0 mg/L of total ammonia nitrogen as N.
- c) In addition to the effluent standards set forth in subsections (a) and (b) of this Section, all sources are subject to Section 304.105

(Source: Amended at 26 Ill. Reg. 16948, effective November 8, 2002)

7. On December 17, 1998, the Board granted CITGO a site specific rule regarding total nitrogen ammonia in the Petitioner's discharge. 35 Ill. Adm. Code 304.213. This rule requires CITGO to meet ammonia nitrogen limits of 9.4 mg/L as a monthly average and 26.0 mg/L as a daily maximum. This rule also requires CITGO to meet the Best Available Technology Economically Available (BAT) limitations. 35 Ill. Adm. Code 304.213; *see* 40 C.F.R. 419.23(1992)¹.

III. IMPLEMENTATION OF FEDERAL LAW

8. The effluent standards of 35 Ill. Adm. Code Part 304 were adopted by the Board to implement, in part, the water quality standards of Section 303(a) of the Clean Water Act, 33 U.S.C. §1313(a), and the Illinois water quality standards of 35 Ill. Adm. Code Part 302.

¹ The US EPA BAT model is based on a wastewater treatment plant that includes the following treatment process: i) flow equalization; ii) Initial oil and solids removal (API separator or baffle plate separator); iii) Additional oil/solids removal (clarifiers or dissolved air flotation); iv) Biological treatment; and v) Filtration or other final polishing steps. SOURCE??. The BAT limitations are based on the best available technology at the time regulations were written. These regulations do not take into account treatment technology improvements or use of lower grade crude feedstocks.

IV. NATURE OF PETITIONER'S ACTIVITY

9. CITGO operates a petroleum refinery near Lemont, Illinois that was formerly owned by UNO-VEN. On May 1, 1997, PDV Midwest Refining L.L.C., purchased Lemont refinery from UNO-VEN and contracted with CITGO to operate the refinery. *Petition at 1-2; Technical Report at 1.* CITGO's discharge of ammonia nitrogen into the Chicago Sanitary and Ship Canal ("Ship Canal") is permitted pursuant to National Pollutant Discharge Elimination System ("NDPES") permit No. IL0001589. *Petition at 6.* The permit limits for ammonia nitrogen are consistent with the current site specific rule at 35 Ill. Adm. Code 304.213, 9.4 mg/L as a monthly average and 26.0 mg/L as a daily maximum. CITGO's NPDES permit was modified by the Agency on June 22, 2007, and will expire on July 31, 2011. *Id.*

10. The Lemont refinery was constructed in 1967 through 1970. According to the Petitioner, the maximum daily production at this facility is approximately 168,000 barrels per day. *Petition at 5.* CITGO refines both domestic and foreign crude oil to produce gasoline, kerosene, home heating oil, aviation fuel, diesel oil, petrochemical solvents, and petroleum coke. *Petition at 5, Technical Report at 3.*

11. Both the crude oil and the Ship Canal have experienced declining trends in ammonia concentrations. The most recent data presented by CITGO shows that the nitrogen content of the crude oil has declined by 10 percent from the levels seen in the late 1990's and early 2000's. *Technical Report at 3.* The average ammonia concentration in the intake has also declined since 1999. *Technical Report, Figure 3-3, at 13.* According to the data collected in 2006, the average concentration of ammonia in the Canal is 0.7 mg/L. *Technical Report at 13.*

12. The original design of the CITGO's wastewater treatment plant included two oil-water separators, a flow equalization tank, a primary clarifier, activated sludge system, and a

polishing pond prior to discharge. *Petition at 6.* The amount of ammonia nitrogen present in a wastewater facility's effluent depends on several factors including nitrogen content in the crude oil, crude oil throughput, influent BOD5, TSS, and oil loadings, and degree of nitrification being achieved in the wastewater treatment plant. *Petition at 10.* The four sour water strippers used by CITGO to remove ammonia from the process wastewater achieve an average of 95% to 96.8% of removal efficiencies. *Petition at 3, Technical Report at 12.*

13. The Petitioner provides a list of improvements of upgrades that have been made to the wastewater collection and treatment system since 1987. *Petition at 13-14.* However, not all of CITGO's listed improvements or upgrades were installed to remove ammonia. Some of these improvements, such as sour water stripping and nitrifier inhibition testing, were made for ammonia removal. However, the addition of a second clarifier, an induced gas flotation system, and clean closure of a stormwater basin appear not to be directly related to ammonia removal. Other modifications such as aeration improvements and control and chemical feed improvements can have multiple benefits. CITGO's installation of the Purge Treatment Unit is also unrelated to historic ammonia removal issues as it was installed specifically to treat wastewater from the new FCC scrubber. Thus, the Petitioner's claim that CITGO and its predecessors have spent nearly \$75,000,000 to upgrade and improve the wastewater treatment facilities is not directly related to removal of ammonia nitrogen from the effluent. *Petition at 4.* It is not unusual for facilities to upgrade wastewater treatment facilities to replace aging systems or to account for new wastestreams present in the effluent. Although CITGO claims that more than \$45,000,000 has been spent in the last ten years on capital projects related to ammonia control and reduction, it does not explain exactly which projects were included in the capital project total. Also,

CITGO does not sufficiently define how each project was designed to improve ammonia removal.

V. GENERAL LEVEL OF JUSTIFICATION REQUIRED

14. The regulation of general applicability at 35 Ill. Adm. Code 304.122 does not specify a level of justification or other requirements necessary for this type of adjusted standard. Accordingly, the general level of justification provided in Section 28.1 of the Act is applicable here. That subsection provides:

[T]he Board may grant individual adjusted standards whenever the Board determines, upon adequate proof by petitioner, that:

- 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 and 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.
- 415 ILCS 5/28.1(c) (2006); *See also* 35 Ill. Adm. Code Section 104.426.

For the reasons outlined below, the Illinois EPA asserts that the Petitioner has failed to satisfy the burden of proof specified in Section 28.1(c) of the Act:

A. FUNDAMENTALLY DIFFERENT FACTORS

15. CITGO must prove that the “factors relating to the petitioner are substantially different from the factors relied upon by the Board in adopting the general regulations.” *See* 415 ILCS 5/28.1(c). When first adopted by the Board, the provisions at issue in this proceeding were

codified as Rule 406. On January 6, 1972, the Board adopted the language currently in Section 304.122(a) in the combined dockets of R70-8, R71-14, and R71-20. There was extensive testimony as to the availability of methods for reducing ammonia in effluents. It was determined that nitrification can be satisfactorily accomplished for a reasonable price by a second stage of biological treatment. *Id.* at 3-406. The Board concluded that,

[T]he evidence is clear that for too long the oxygen demand exerted by ammonia in domestic wastes has been over-looked in the emphasis on reduction of five day BOD. The State Water Survey has conclusively shown that reduction of ammonia from larger sources feeding the Illinois River is necessary if existing standards for dissolved oxygen, essential to adequate fish population, are to be met. *Id.* at 3-406.

In 1973, the Board adopted the language currently found in Section 304.122(b), from which CITGO seeks relief, In *In the Matter of Effluent Criteria, (SWB-14), R70-8, R71-14, R71-20, (January 6, 1972)*. This rule requires sources discharging to any of the water listed in Rule 406 and having an untreated waste load that could not be computed on a population equivalent basis and discharging ammonia nitrogen in excess of 100 pounds per day, could not discharge an effluent containing more than 3.0 mg/L of ammonia nitrogen after December 31, 1974. *Id.* The Board's basic intent in adopting the effluent requirements in the above-mentioned rulemaking was to provide a uniform baseline of treatment technology to be employed by all facilities discharging into waters of the State. At this point, CITGO is the only oil refinery discharging to the Ship Canal that has yet to meet the ammonia nitrogen standard at 35 Ill. Adm. Code 304.122(b).

16. CITGO identifies several factors that they believe are substantially and significantly different from the factors relied on by the Board in adopting the ammonia nitrogen standard. Specifically, CITGO cites to the Board's previous adjusted standard proceedings and claims "the Board has already found the situation to be unique and site specific relief." *See e.g.,*

In the Matter of Petition of UNO-VEN, R93-8, Opinion and Order of the Board (December 16, 1993), *In the Matter of Petition of PDV Midwest Refining, LLC*, R98-14, Opinion and Order of the Board (December 17, 1998). The Board made no such specific findings in these Board opinions. While the Board has granted CITGO relief from the ammonia nitrogen standard in the past, the focus was on requiring the Lemont Refinery "... to make continued efforts to reduce the ammonia nitrogen concentrations in its wastewater." *R98-14 at 4*.

17. CITGO also claims that the Board did not consider the costs of treatment for ammonia in a refinery wastewater discharge. *Petition at 19*. Contrary to CITGO's assertions, the Board did consider the cost of ammonia treatment to be reasonable. Specifically, the Board was "convinced that nitrification can be satisfactorily accomplished for a reasonable price...." *In the Matter of Effluent Criteria, (SWB-14), R70-8, R71-14, R71-20, (January 6, 1972) at 3-406*.

18. CITGO further claims that the discharge from the refinery does not pose any threat to human health or the environment and is not significantly greater than the environmental impact that the Board was trying to control when it adopted the ammonia nitrogen rule. Since Section 304.122(b) is a technology based standard, not a water quality standard, CITGO's assertion is irrelevant to the issue at hand as there exist removal technologies that are economically reasonable and technically feasible.

19. CITGO contracted with AWARE Environmental Inc. ("AWARE") to prepare a report, Technical Review of Ammonia Treatment at the Wastewater Treatment Plant- CITGO Petroleum Corporation, Lemont Refinery, which evaluates the current conditions at the refinery. In this report, AWARE also describes the wastewater practices at the three other oil refineries in Illinois: Conoco-Phillips, Roxana, IL; Exxon-Mobil, Joliet, IL; and Marathon, Robinson, IL . CITGO opines that while there are no treatment technology differences between the refinery and

other refineries in Illinois, there are however differences in specific design details. *Petition at 19.* With the exception of CITGO, the remaining three oil refineries in Illinois are capable of meeting the ammonia nitrogen limits required in 35 Ill. Adm. Code 304.122(b). Marathon Oil Refinery has permit limits requiring lower, water quality standard based limits, which it regularly meets. Conoco-Phillips Refinery does not have water quality based limits due to its location on the Mississippi River, however, nitrification is known to occur on a regular basis given the ammonia levels measured in the effluent and the results of whole effluent toxicity testing.

20. All refineries have preliminary oil separation followed by an additional oil-water separator using a gas flotation process. The biological treatment is activated sludge. According to CITGO, the operating parameters such as sludge age, food-to-microorganism ratio, aeration levels, pH, and temperature are all within appropriate ranges to provide nitrification, yet it cannot meet the ammonia nitrogen standard. It seems to the Agency that CITGO needs to investigate whether its equipment is properly sized and operated for the current needs of the facility. Neither the petition nor the supporting documents address the adequacy of residence time in the aeration basins to ensure that consistent nitrification is occurring.

Table 4-6 of the CITGO's technical review document compares the detention times of the activated sludge treatment processes at each Illinois refinery. *AWARE at 58.* CITGO's wastewater treatment plant aeration basins have the lowest detention time of the four refineries in Illinois. The detention time in CITGO's aeration basin is shown as 7.7 hours (0.32 days) as compared with Exxon-Mobil at 10.9 (0.45 days). The table also shows that Exxon-Mobil is upgrading their system which will result in a detention time of 19.4 hours (0.81 days). *Id.* Additionally, the detention time for Conoco-Phillips and Marathon are 1.31 days and 1.54 days respectively. These longer detention times may be at least partially responsible for the more

effective and more consistent nitrification achieved at these facilities. While various options for increasing the biological treatment capacity of the treatment facility were considered, CITGO did not consider the construction of an additional aeration basin and/or an associated additional clarifier to provide a longer detention time, more in line with other refineries.

21. ExxonMobil is subject to the same Section 304.122(b) limits as CITGO and had previously received the Board relief as has CITGO. ExxonMobil is now forgoing further Board relief and will have the Section 304.122(b) dictated permit limits in their next renewed permit. ExxonMobil, which processes roughly 245,000 barrels per day, notified the Agency in an April 28, 2008 letter that it will meet the lower 3mg/L and 6 mg/L effluent limits. *See Attachment 1.* The facility which specializes in heavy sour crude primarily from Canada, but also from the U.S. Gulf, discharges 4.32 MGD of treated process wastewater and 10.47 MGD of non-contact cooling water to the Des Plaines River. The treatment system consists of two API separators and air flotation units for oil and solids removal, activated sludge and clarification for biological treatment, and 4.9 MG polishing pond for tertiary treatment. On March 19, 2007, Illinois EPA issued a state construction permit (2007-EN-2703) to Exxon-Mobil. *See Attachment 2.* This construction permit allows the construction of additional clarifiers in an amount to add 6,400 square feet of surface area, to work in parallel with their existing treatment plant, to give a total surface area of 16,453 square feet. This will result in a detention time of roughly 19 hours and 262 GPD/square feet of clarifier overflow. While it not clearly stated in the AWARE report, Exxon-Mobil's upgrade may be at least partially responsible for meeting the applicable ammonia limits.

22. CITGO also references that it is having difficulty maintaining adequate nitrification because of a higher percentage of heavy crude in recent years. *Petition at 3,*

AWARE 30, 33. The Illinois EPA does not consider the uncertainty associated with the crude to be of any notable significance. CITGO is receiving its crude supply from the same pipeline system that feeds to other refineries in Illinois. Based on the information provided by other refineries, it is clear that other facilities have or are making changes to process higher amounts of heavy crude. Further, these refineries have no difficulty meeting the applicable ammonia limitations.

B. ENVIRONMENTAL IMPACT

24. CITGO claims that granting adjusted standard relief from Section 304.122 will not result in any adverse environmental impacts. *Petition at 6.* CITGO further claims that the ammonia water quality standard will be met at the edge of the mixing zone. The Illinois EPA disagrees that the relief from the ammonia nitrogen standard would not have any adverse environmental impacts. By seeking a relief from Section 304.122 ammonia standard, CITGO is subjecting a portion of the Ship Canal to experience much higher ammonia concentrations, 6.9 mg/L as a monthly average and 10.61 mg/L as a daily average. As ammonia is a toxic substance, aquatic life will not inhabit affected areas where the effluent mixes with the receiving water. The Ship Canal will thus have an area that is effectively unavailable as habitat for sensitive forms of aquatic life. Requiring CITGO to meet the Section 304.122 ammonia standard would not only reduce the area currently unavailable for aquatic life, but also help to improve the dissolved oxygen conditions in the Ship Canal.

C. CONSISTENCY WITH FEDERAL LAW

25. Section 303(d) of the Clean Water Act requires the Illinois EPA to identify water quality limited waters (also called impaired waters), the pollutants causing impairment to those waters, a priority ranking for the development of Total Maximum Daily Load (“TMDL²”). 33 U.S.C. §1313(d). According to the Agency’s Illinois Water Quality Report 2006, the Ship Canal is impaired for indigenous aquatic life use with dissolved oxygen as a cause. Other causes of impairment are: polychlorinated biphenyls (PCBs) iron, oil, grease, total nitrogen, and total phosphorus. The federal regulations require states to conduct a TMDL for pollutants causing impairment. *See* 40 C.F.R. 130.7. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. Thus, a TMDL is the sum of the allowable loads of a single pollutant from all contributing sources. *Id.* Also, the federal regulations require that a TMDL “shall be established for all pollutants preventing or expected to prevent attainment of water quality standards.” *See* 40 C.F.R. 130.7(c). Although ammonia nitrogen is not one of the listed causes, it has a direct impact on the dissolved oxygen levels in the Ship Canal. Ammonia is an oxygen demanding substance. As a result, discharge of higher ammonia by CITGO will remove more dissolved oxygen from the Ship Canal. For a waterbody that is already listed as impaired for the dissolved oxygen water quality standard, adding higher ammonia discharge levels would only further prevent attainment of dissolved oxygen standard. This would be in a direct conflict with the mandates of the Clean Water Act. Requiring CITGO to reduce the ammonia to levels required by Section 304.122 would ensure that a source of oxygen demanding waste to the Ship Canal has been eliminated.

VI. ADDITIONAL JUSTIFICATION FACTORS

26. The Board regulation at 35 Ill. Adm. Code 104.426 requires the Board to review Petitioner's justification for an adjusted standard consistent with Section 27(a) of the Act, 415 ILCS 5/27(a)(2006). This Section requires the Board to take into account five specified factors when promulgating regulations, including adjusted standards: i) the existing physical conditions; ii) the character of the area involved including surrounding land use; iii) zoning classifications; iv) nature of the receiving water body; and v) the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution. As explained below, it is the Illinois EPA's conclusion that CITGO has not satisfactorily proven the necessity of continued relief.

A. EXISTING PHYSICAL CONDITIONS

27. CITGO's outfall is located at river mile 296.5 on the Ship Canal, 5.5 miles upstream of the Lockport Lock and Dam. The receiving waterway has a 7-day, 10- year low flow ("7Q10") is 850 MGD or 1315 cubic feet per second ("cfs"). *Petition at 7*. In addition to CITGO's discharge, three major water reclamation plants, combined sewer overflows, non-point source runoff, and industrial charges also discharge to the Ship Canal. *Petition at 5*. The existing water quality conditions with respect to ammonia and dissolved oxygen have been monitored by the Illinois EPA, the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), and the U.S. Geological Survey (USGS), and Midwest Generation, LLC.

B. CHARACTER OF THE AREA INVOLVED, INCLUDING SURROUNDING LAND USES

² A TMDL is the sum of the allowable loads of a pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality.

28. Petitioner did not provide any information regarding the area involved or the surrounding land uses for this requested relief.

C. ZONING CLASSIFICATIONS

29. Petitioner did not provide any information regarding the zoning classifications for this requested relief. The Agency believes that the Lemont Refinery is located in a zoning area classified as Industrial use.

D. NATURE OF THE RECEIVING BODY

30. Under Title 35: Environmental Protection; Subtitle C: Water Pollution, Chapter I: Pollution Control Board; Part 303; Subpart C, the Ship Canal is classified as a Secondary Contact water. The Chicago Waterway is designated as a Secondary Contact water up to the Des Plaines River at the I-55 Bridge. Below the I-55 Bridge, the Des Plaines River is designated as General Use water. The General Use waters begin 18.5 miles below the CITGO's outfall. *Petition at 7.* The water quality standards for un-ionized ammonia and dissolve oxygen are 0.1 mg/L (maximum) and 4.0 mg/L (minimum), respectively. However, the Agency has proposed to amend the water quality standards applicable to the Ship Canal. *See R 08-09.* Under this proposal, the Agency is amending the ammonia water quality standard to be similar to the General Use ammonia water quality standard. *See 35 Ill. Adm. Code 302.212(e).* Recently, the Agency has assessed the overall Ship Canal as non supportive for fish consumption and aquatic life, based on polychlorinated biphenyls (PCBs) iron, oil, grease, D.O., total nitrogen, and total phosphorus. *See Illinois Water Quality Report 2006.*

E. TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

31. The Petitioner considered the following four removal technologies: 1) Activated sludge with powdered activated carbon addition (PACT); 2) Activated sludge with a fixed media system; 3) Activated sludge with membrane bioreactor; and 4) Activated sludge with breakpoint chlorination and dechlorination. *AWARE at 41.*

32. Activated sludge with powdered activated carbon addition: The annualized cost for this alternative is \$3,630,000 per year, assuming a capital recovery factor for 10 years at 8 percent interest. *AWARE at 46.* The cost estimate includes facilities for carbon regeneration and sludge disposal. The AWARE report outlines some concerns regarding the use of this technology. *AWARE at 46.* AWARE notes that powdered activated carbon process can improve biological nitrification, yet it concludes that this alternative cannot assure compliance with the 3 mg/L ammonia nitrogen criteria. *Id.*

33. Activated sludge with a fixed media system: The total annual cost for this option is \$3,220,000 per year. *AWARE at 47.* Aside from the cost estimates, AWARE raises two concerns for this alternative: i) the sensitivity of the nitrifiers, and ii) chemical incompatibility. *Petition at 17.*

34. Activated sludge with membrane bioreactor: The annual operating cost for this removal technology is \$3,280,000. The total annualized cost for the membrane bioreactor alternative is \$11,400,000. *AWARE at 50.* AWARE identifies several concerns with this alternative, including limited data on MBR systems for biological nitrification applications in the refining industry, full scale MBR systems have experienced problems with foaming and fouling of membranes, and the resulting expensive cleaning and replacement operations. *Id.*

35. Activated sludge with breakpoint chlorination and dechlorination: The estimated annualized cost for the chlorination/dechlorination system is \$3,640,000. *AWARE at 56.* The main concerns with this alternative are: chlorine as well chlorinated organic by-products are generally toxic to fish as well as harmful to aquatic biota even at low concentrations.

36. AWARE concludes that the least expensive alternative is fixed media biological treatment unit. Although conceding that by upgrading the treatment plant with additional treatment steps, such as a fixed media biological treatment unit, additional ammonia removal may be achieved, AWARE ultimately concludes that it is uncertain whether upgrading the system with achieve consistent compliance with the 3.0 mg/L ammonia nitrogen standard. *AWARE at 59.*

37. Instead of pursuing one of the removal technologies outlined in the AWARE report, CITGO continues to believe that the ongoing optimization program at the Lemont Refinery is a better option to improve ammonia nitrogen removal. *AWARE at 59.* In essence, CITGO argues that even though there is a least expensive option available, it is not worth pursuing because there is an uncertainty regarding whether consistent compliance with the ammonia nitrogen standard can be achieved. CITGO thus claims that “there are no alternatives that are both technologically feasible and economically reasonable to achieve the ammonia reduction necessary to comply with 35 Ill. Adm. Code 304.122(b).” *Petition at 16.* The Agency disagrees with CITGO’s claim because other refineries in Illinois have been able to successfully apply these removal technologies to ensure consistent compliance with the ammonia nitrogen standard. The information provided by CITGO does not show that what is economically reasonable and technically feasible at other refineries in Illinois, is economically unreasonable and technically infeasible for the Lemont Refinery.

38. The limited nature of the economical analysis and marginal concerns makes it hard for the Agency to agree with CITGO's conclusion that the removal technologies are technically infeasible and economically unreasonable. The Agency believes that a serious look at these options would allow CITGO to select a technology that is not only economical but also is capable of ensuring consistent compliance with the ammonia nitrogen standard.

39. The requested relief focuses on monitoring the nitrogen content of the feedstock, to "continue it's efforts" to reduce ammonia, and to control and manage solids from it's crude oil supply. *Petition at 11*. CITGO fails to describe the nature of these efforts and the potential reductions in ammonia to the Ship Canal. To achieve compliance with the ammonia nitrogen standard, CITGO needs to do more than just monitor the nitrogen content of the feedstock. Along with considering removal technologies, CITGO should also focus on the performance efficiencies of its biological treatment process, and improvements to the solids handling process and the desalter. Instead of continuing to speculate on what might potentially work or not work at the Lemont Refinery, CITGO should perhaps duplicate technology designs of one of the other refineries, such as Exxon-Mobil, so that it can also comply with the applicable standard.

VII. HEARING

40. Pursuant to 35 Ill. Adm. Code §104.406(j), CITGO requests a hearing in this matter.

VIII. RECOMMENDATION AND CONCLUSION

41. The Petitioner has the burden of proof in an adjusted standard proceeding. *See* 35 Ill. Adm. Code 104.206. Petitioner must also justify their adjusted standard request consistent

with the requirements of Section 27(a) of the Act. Pursuant to 415 ILCS 5/28.1 and consistent with 415 ILCS 5/27(a), the Agency recommends that Petitioner's request for relief from effluent limitations concerning total ammonia nitrogen be DENIED.

The Part 304 effluent standards are the absolute minimum standards for point sources from which a relief should only be granted in rare and most extraordinary circumstances. In the past, the Board cautioned the regulated community that the Board will rarely grant relief from Part 304 standards. *In the Matter of: Petition for Site Specific Exception to Effluent Standards for the Illinois American Water Company, East St-Louis Treatment Plant, R85-11*, slip op at 11, February 2, 1989.

For thirty-one (31) years, or five variances and five adjusted standards later, Petitioner is essentially at the same place where they started in 1977—CITGO proposes to continue to monitor the nitrogen content and to “continue it's efforts” to reduce ammonia and to control and manage solids from it's crude supply. *Petition at 11*. CITGO has not established that factors relating to its Lemont refinery are substantially and significantly different from the other refinery located on the same discharge waterway. In fact, Exxon Mobil, a similarly situated oil refinery discharging to the Ship Canal, has updated its facilities in an effort to meet the ammonia nitrogen standard, rather than seeking continuation of its relief from the Board. The Petitioner has failed to demonstrate that the rule of general applicability is technically infeasible and economically unreasonable when applied to the Petitioner's facility. Consequently, CITGO's requested relief does not meet the requirements established under 35 Ill. Adm. Code Section 104.426 as well as Sections 27(a) and 28.1 of the Act. Therefore, the Agency urges the Board to deny the Petitioner's request for extending this relief.

WHEREFORE, for the reasons stated herein, the Illinois EPA recommends that the Pollution Control Board **DENY** the adjusted standard Petition of CITGO.

Respectfully Submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY



BY: _____

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Division of Legal Counsel

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ATTACHMENT 1

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT****LOG NUMBERS:** 2703-06**PERMIT NO.:** 2007-EN-2703**FINAL PLANS, SPECIFICATIONS, APPLICATION
AND SUPPORTING DOCUMENTS****DATE ISSUED:** March 19, 2007**PREPARED BY:** Huff and Huff, Inc.**SUBJECT:** EXXONMOBIL OIL CORPORATION -- Construction/Modification to WWTP - ExxonMobil Oil Corp. Joliet Refinery WWTP tributary to Des Plaines River - NPDES Permit No. IL0002861**PERMITTEE TO CONSTRUCT**

ExxonMobil Oil Corporation - Joliet Refinery
Joliet Refinery
25915 S.E. Frontage Road
Channahon, IL 60410

Permit is hereby granted to the above designated permittee(s) to construct and/or operate water pollution control facilities described as follows:

A modification to the WWTP located at the Joliet Refinery consisting of the addition of a Purge Treatment Unit, which consists of a combined reactor/clarifier (22 ft diameter, 74 ft high) and heat exchanger system located within the Fluidized Catalytic Cracking Unit area and the addition of an Integrated Biological System (102 ft diameter, 28 ft high), which consists of an anoxic and outer aeration zone with recirculation, a de-aeration transition flocculation chamber, eight internal integrated clarifiers (6,400 sq. ft. of surface area) to work in parallel with the two existing BIOX Basin Clarifiers (16,453 total sq. ft. of surface area), and all of the pumps, piping, blowers, indicators, meters, sampling equipment, and appurtenances necessary to discharge to the Joliet Refinery WWTP for treatment before discharging to the Des Plaines River under NPDES Permit No. IL0002861

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

SPECIAL CONDITION 1: All sludges generated on-site shall be transported for disposal at an Illinois Environmental Protection Agency permitted facility using the Agency's Supplemental Permit and manifest system in accordance with the Environmental Protection Act. If the sludge is a hazardous waste, the generator must comply with all applicable requirements of 35 Ill. Adm. Code Parts 702, 703, 705 and 720 to 725.

SPECIAL CONDITION 2:

A. Accumulation of hazardous waste at this facility (if generated) shall be carried out in accordance with 35 Ill. Adm. Code, Chapter 1, Subtitle G, Part 722: Standards Applicable to Generators of Hazardous Waste.

Page 1 of 2**THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.**

SAK:MEL:270306.wpd

DIVISION OF WATER POLLUTION CONTROL

cc: EPA - Des Plaines FOS
Huff and Huff, Inc.
Records - Industrial
Binds


Alan Keller, P.E.
Manager, Permit Section

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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LOG NUMBERS: 2703-06

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**FINAL PLANS, SPECIFICATIONS, APPLICATION
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B. Transport of all special waste to a permitted treatment, storage or disposal site shall be carried out in accordance with Title 35 Ill. Adm. Code, Chapter 1, Subtitle G, Part 809: Special Waste Hauling.

SPECIAL CONDITION 3: This Permit is issued with the expressed understanding that there shall be no surface discharge from these facilities, except for those otherwise approved under NPDES Permit No. IL0002861. If such discharge occurs, additional or alternate facilities shall be provided. The construction of such additional or alternate facilities may not be started until a Permit for the construction is issued by this Agency.

SPECIAL CONDITION 4: The operational portion of this permit shall be governed by NPDES Permit No. IL0002861.

SPECIAL CONDITION 5: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

ATTACHMENT 2

ExxonMobil
Refining & Supply Company
Joliet Refinery
P.O. Box 874
Joliet, Illinois 60434-0874

ExxonMobil
Refining & Supply

VIA CERTIFIED MAIL

April 28, 2008

Mr. Alan Keller
Manager, Permit Section
Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, IL 62702

Re: NPDES Permit Renewal NPDES Permit No. IL0002861

Dear Mr. Keller:

I write on behalf of ExxonMobil Oil Corporation's Joliet Refinery (Refinery), located near Joliet, Illinois.

As you are aware, ExxonMobil's Joliet Refinery (Joliet Refinery), under a Consent Order with the State of Illinois and the federal government, is in the process of installing facilities to reduce sulfur dioxide air emissions by approximately 80%. In anticipation of the installation of this equipment, a site-specific rule change for Total Dissolved Solids (TDS) was requested and has been approved by the Illinois Pollution Control Board, and the Illinois Environmental Protection Agency (EPA) has issued the necessary construction permits for this project. Hydrostatic testing and acclimation of the new equipment is scheduled to begin this spring and summer, operating under the existing NPDES permit.

Per the Agency's request, ExxonMobil has reviewed carefully the historic performance of the wastewater treatment plant and the expected performance of the expanded facilities (i.e., wet gas scrubber). In spite of the additional flow, the Joliet Refinery has elected to retain its existing effluent loading limits for all parameters, with the exception of one, in the process wastewater effluent, 001. The single exception is ammonia, where the Joliet Refinery has not pursued renewal of its adjusted standard, and will meet lower 3 mg/L and 6 mg/L effluent limits and lower load limits. This will result in a net decrease in the permitted ammonia discharge.

Attached please find a revised draft permit, both in red-lined form and without the redlining for your consideration. Significant requested changes are listed below:

- The loadings are based on the new design average flow and design maximum flow for ammonia, as opposed to only the design maximum flow in the Agency's draft. This results in tighter ammonia monthly average load limits.
- The other load limits for Outfall 001 were based on the existing NPDES permit limits, and this is noted under the "Regulation" column.

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Page 2
NPDES Permit Renewal

- Moved the note regarding monitoring for chlorine to the appropriate location on the combined Outfalls 001, 002 and 003.
- Added a more complete description for Outfalls for 002 and 003.

The second attachment is a supplemental report that addresses the permit application requirements of 35 IAC §302.105 "Antidegradation", consistent with assuming the loading limits discussed above and the sodium sulfate discharge addressed in the site-specific rule for TDS.

The final attachment provides current Material Safety Data Sheets.

Please contact Brad Sims at (815) 521-7041, if there are any questions regarding this application addendum. As always, ExxonMobil is prepared to meet with the Agency to discuss any of the requested changes. We look forward to working with IEPA to finalize this permit.

Very truly yours,

Signature:



Name:

Rick E. Szalach

Officials Title:

Refinery Manager

Telephone No.:

(815) 521-5571

Date Signed:

4-28-08

Attach.

WBS/mzf

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WPC--Permit Log In

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NPDES Permit Renewal NPDES Permit No. IL0002861

bcc: Katherine Hodge
Hodge, Dwyer, Zeman
3150 Roland Avenue
Springfield, IL 62703

James E. Huff
Huff & Huff, Inc.
915 Harger Road, Suite 330
Oak Brook, IL 60523

R. E. Szalach
W. G. Sint
M. Cannon
J. L. Noga
G. R. Morris
H. F. Smith
W. B. Sims
J. G. Florez
R. D. Faford

STATE OF ILLINOIS)
)
COUNTY OF SANGAMON)

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JUN 23 2008

STATE OF ILLINOIS
Pollution Control Board

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached AGENCY'S RECOMMENDATION upon the persons to whom it is directed, by placing a copy in an envelope addressed to:

John T. Therriault, Assistant Clerk
Illinois Pollution Control Board
James R. Thompson Center
Suite 11-500
100 West Randolph Street
Chicago, IL 60601

Jeffery C. Fort
Ariel J. Teshler
Sonnenschein Nath & Rosenthal LLP
233 S. Wacker Drive
Chicago, IL 60606-6404

Bradley Halloran
Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center, Suit 11-500
100 West Randolph Street
Chicago, IL 60601

Bill Richardson, General Counsel
Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

Matthew J. Dunn
Division Chief, Environmental Enforcement
Illinois Attorney General
100 W. Randolph Street, 12th Floor
Chicago, Illinois 60601

and mailing it from Springfield, Illinois on June 20, 2008, with sufficient postage affixed as indicated above.

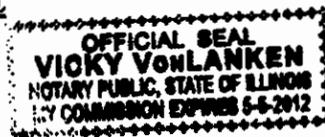
Meredith Kelley

SUBSCRIBED AND SWORN TO BEFORE ME

this day of June 20, 2008.

Vicky VonLanken

Notary Public



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
 DIVISION OF LEGAL COUNSEL
 1021 NORTH GRAND AVENUE EAST, POST OFFICE BOX 19276
 SPRINGFIELD, ILLINOIS 62794-9276
 TELEPHONE (217) 782-5544 FACSIMILE (217) 782-9807

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CLERK'S OFFICE

JUN 23 2008

STATE OF ILLINOIS
Pollution Control Board

DATE: 6/20/08

FACSIMILE TRANSMITTAL SHEET

PLEASE DELIVER THE FOLLOWING PAGES TO:

PARTY'S NAME: John Therriault

FIRM/COMPANY NAME: _____

FACSIMILE NO: _____

TELEPHONE NO: _____

FROM: Sanjay Sofat

RE: As 08-08

TOTAL NUMBER OF PAGES (INCLUDING THIS PAGE): 29

HARD COPY WILL _____ WILL NOT _____ FOLLOW

IF YOU DO NOT RECEIVE ALL OF THE PAGES, PLEASE CALL (217) 782-5544

COMMENTS: _____

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