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STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
Petition of Noveon, Inc.)
)
)
)
for an Adjusted Standard from)
35 Ill. Adm. Code 304.122)

AS 02-5

NOTICE OF FILING

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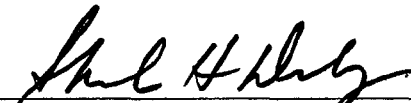
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PLEASE TAKE NOTICE that on Wednesday, July 14, 2004, we filed the attached **POST-HEARING REPLY MEMORANDUM OF NOVEON, INC.** with the Illinois Pollution Control Board, a copy of which is herewith served upon you.

Respectfully submitted,

NOVEON, INC.

By:



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POST-HEARING REPLY MEMORANDUM OF NOVEON, INC.

Noveon, Inc., f/k/a The BFGoodrich Company ("Noveon"), through its undersigned attorneys, respectfully submits this Post-Hearing Reply Memorandum in support of its Petition for an Adjusted Standard from the ammonia effluent standard set forth at 35 Ill. Adm. Code 304.122(b).

I. Summary of the Issues

In the Petition for Adjusted Standard and Noveon's opening Post-Hearing Memorandum, Noveon requested the Board to determine that Section 304.122(a) applies but does not require an effluent limitation for Noveon, because a population equivalent comparable to that used for municipal wastewater treatment plants can be calculated for Noveon's untreated waste load and that calculation yields a population equivalent less than 50,000 for all relevant parameters. If the Board concludes that Section 304.122(b) applies, as contended by Illinois EPA and strongly disputed by Noveon, Noveon seeks relief from its effluent limitation and requests as part of the relief that the Board also grant Noveon a mixing zone and zone of initial dilution ("ZID") properly calculated in accordance with federal and state regulations.

Should an adjusted standard be necessary, Noveon has met its burden of proof. Noveon provided evidence at the hearing that it does provide source control measures to reduce ammonia, but Noveon has conducted extensive assessment of numerous treatment technologies

and has concluded that no technology is available to Noveon for treatment of ammonia in its effluent that is both economically reasonable and technically feasible to allow it to achieve compliance with 35 Il. Adm. Code 304.122(b). Finally, Noveon has provided all information necessary for calculation of a mixing zone and ZID. The Board has all the information necessary to decide the questions before it and issue a complete decision.

II. Statement of Facts

Noveon and Illinois EPA each provided complete statements of facts in their respective briefs, and the parties agree on most facts before the Board. It is therefore unnecessary for Noveon to repeat the facts, but it is necessary to correct or respond to specific areas where Illinois EPA has misstated a fact or argued in error.

In Noveon's opening memorandum, Noveon explained the crux of its conclusion and the case presented to the Board, which is that there are no options available for treatment of ammonia at Noveon's facility that are both affordable and technically feasible. Illinois EPA cannot refute this conclusion. Illinois EPA claims in its statement of facts, however, that "[a]fter 10 years of study, Noveon concluded that no affordable compliance options were available." Illinois EPA's Response Memorandum ("Resp. Mem.") 2. This statement is troubling because in the attempt to simplify Noveon's extensive, lengthy and costly investigation, Illinois EPA entirely misconstrues the point of Noveon's conclusion. This proceeding is not simply about affordability, although economics are indeed an issue. It is also about the state of the current technology and its ability to treat Noveon's unique wastewater to achieve consistent compliance with the effluent limit of 35 Il. Adm. Code 304.122(b). This will be discussed in more detail in Noveon's response to Illinois EPA's claims concerning the treatment alternatives.

Noveon provided a thorough explanation of its treatment facility accompanied by a flowchart. In Illinois EPA's description of the treatment facility, it misstated or misunderstands certain aspects of Noveon's state-of-the-art treatment facility, for which a good understanding is necessary for purposes of evaluating the treatment Noveon provides and Noveon's request for relief. Illinois EPA states that Noveon upgraded its wastewater treatment facility in 1998 in order to expand production. Resp. Mem. 6. The other reason for the upgrade, omitted by Illinois EPA, was to provide greater operational flexibility. *See* Tr. 107-08. The upgrade was not a tankage increase only. It was also designed to provide greater treatment process redundancy. Noveon has explained that the holding ponds are used for stormwater, non-contact cooling water, and utility waters. Illinois EPA stated that these waters are pumped from the holding ponds to the wastewater treatment process to add flow. *See* Resp. Mem. 4. The pond water is pumped into the wastewater treatment process to enhance treatment, and not simply to add additional flow. Pet. Ex. 7 at 7, 8. The reason for diverting the water to the activated sludge system is to enhance both the treatment performance of the activated sludge system and the sand filter which treats the remaining water in the holding ponds. The addition of this flow enhances biological treatment by providing reduced concentrations of bio-inhibitors. This same addition reduces the loading on the sand filters so that they perform better in providing treatment.

Noveon also pointed out in its written testimony and opening memorandum that its plant meets the Ten-State Standards as well as the conditions in Illinois regulations at 35 Il. Adm. Code 307.1210 and 370.920 for the design and operation of nitrifying facilities. Pet. Ex. 7 at 9. Nitrification is the conventional treatment for ammonia, and these standards are used by regulators to critique wastewater treatment facility designs to ensure they are adequate to support complete nitrification. Notwithstanding this high degree of treatment, Noveon's wastewater

treatment facility does not achieve nitrification. Illinois EPA states that this is because of “a variety of reasons, including: inhibition of growth of nitrifying bacteria by specific inhibitory compounds in Noveon’s wastestream, insufficient oxygen due to poor oxygen transfer rates and the need for additional alkalinity to be chemically added.” Resp. Mem. 5. Illinois EPA statement is only half correct. As compared to the requirements for nitrifying facilities, Noveon’s wastewater treatment plant maintains ample oxygen and alkalinity to initiate and sustain a degree of nitrification. Tr. 108-114; 165. The specific inhibitory compounds in Noveon’s waste stream, however, do not allow nitrification to occur even with ample oxygen and alkalinity.

Noveon stated that its wastewater contains degradable organic nitrogen compounds such as tertiary butyl amine and morpholine. When these compounds are degraded, they release ammonia nitrogen. Pet. Ex. 7, at 7, 9. Illinois EPA has repeatedly and inaccurately stated that these compounds are destructed. *See, e.g.*, Resp. Mem. 5. The ammonia is generated from biodegradation, not destruction of amines. Consequently, effluent ammonia-nitrogen concentrations increase as the presence of these compounds increase in the influent wastewater and as these compounds are more thoroughly biodegraded. This means that the majority of the effluent ammonia nitrogen at the Noveon Plant is due to thorough biological treatment of organic compounds. Pet. Ex. 7 at 16.

III. Argument

A. Illinois EPA’s Response Memorandum Is Insufficiently Substantiated

As an initial matter, Noveon objects to the manner in which Illinois EPA has made its arguments, which has made reply to Illinois EPA’s memorandum difficult. Illinois EPA spends large parts of its memorandum making arguments that do not derive from hearing testimony or

evidence. For example, Illinois EPA spends several pages proposing cost evaluations using municipal information that it presented in its recommendation. Resp. Mem. 19, 20. First and foremost, municipal plants do not treat wastewater anywhere near as complex as that of Noveon. More importantly, an agency recommendation is not evidence, and Noveon made this point at the hearing. Tr. 176-77. A recommendation is akin to an answer in a court proceeding, and its claims must be substantiated at a hearing by testimony from witnesses or admissible evidence. Illinois EPA did not substantiate these claims.

Illinois EPA also makes comparisons to other industrial facilities, the toxicity of other effluents and the treatments purportedly provided. Resp. Mem. 32. But all parties at the hearing agreed that it was inappropriate to bring in other industrial facilities, which cannot be evaluated without an assessment of the facts of each particular facility. Illinois EPA's claims are not admissible, and are not supported with citation and witness testimony. They are merely conjecture.

Finally, with respect to many of the questions now raised by Illinois EPA, Noveon has used as its guide for this proceeding existing regulations and written interpretations, both federal and state. It has had experts available for years, some over ten years. Noveon brought three experts to the hearing to respond to questions in all areas that are relevant, and these experts have been available and have met with Illinois EPA several times through the many years of this proceeding. While legitimate disagreement between the parties based on existing rules is one thing, the Illinois EPA should not be permitted to throw questions at the wall at the eleventh hour in an attempt to disparage the work of Noveon's experts or the evidence.

B. The Board Should Decide That Section 304.122 Does Not Require an Ammonia Limit

Noveon urged the Board to issue a complete decision, including deciding the threshold issue of whether an adjusted standard is necessary from Section 304.122(b) at all. While conceding that the Board has the authority to rule in this proceeding on the applicability of Section 304.122(a) or (b), Illinois EPA has implied, though not directly stated, that the Board should not so rule, relying instead on the permit appeal in PCB 90-7 to decide that issue. Given the posture of the case, the lapse of time, and the positions taken by Illinois EPA in PCB 90-7, Noveon is disturbed by Illinois EPA's suggestion to the Board to limit its decision in this proceeding. In the pending permit proceeding, Illinois EPA has been very clear that it does not believe any information subsequent to issuance of the 1990 permit should be considered by the Board, and has even claimed that the calculation of Noveon's population equivalents should not be addressed at all since Illinois EPA apparently did not perform a reliable calculation. But these issues have been considered and discussed in detail for over ten years between Illinois EPA and Noveon in an attempt to reach an agreement,¹ to no avail.

In its opening memorandum, Noveon provided calculations of the population equivalents based on Noveon's untreated wasteload, which showed that for all relevant parameters, Noveon's P.E. was less than 50,000. Noveon also explained that Illinois EPA's calculations of P.E. were inflated in that they were based on figures in a report prepared for Noveon by Baxter and Woodman, which did not represent Noveon's combined untreated wasteload. Instead, the Baxter and Woodman report provided the wasteload fed from the equalization tanks to the

¹ Illinois EPA states without supporting testimony that the dispute concerning the calculation of population equivalents was a relatively recent realization by the parties. This is not correct, as Noveon's comments to Illinois EPA as far back as the draft permit made clear that Noveon believed the P.E. to be less than 50,000.

primary clarifier, which contains wastestreams that are internal to the wastewater treatment facility, including primary clarifier sludge when sludge dewatering is not occurring, filtrate from sludge dewatering and backwash water from the tertiary (secondary clarifier effluent) filter. Pet. Ex. 7, at 12. These wastestreams add flow, biological oxygen demand (BOD) and total suspended solids (TSS), so that they are not representative of the untreated wasteload and their use amounts to multiple-counting of wastestreams which stay within the wastewater treatment facility. Illinois EPA acknowledged that it incorrectly performed this calculation and withdrew it at the hearing. Illinois EPA has not, however, provided a new calculation. Illinois EPA states that it “did not deem a P.E. calculation equivalent necessary or appropriate,” and Noveon cannot fathom why not given the clear disagreement between the parties. Nevertheless, without any basis, Illinois EPA’s Response Memorandum now challenges the calculations of Noveon’s expert.

Notwithstanding that Illinois EPA’s calculations are incorrect and inflated, its flow and BOD calculations were still substantially below 50,000.² Noveon disputed Illinois EPA’s calculation for TSS, however, which shows this P.E. based on Noveon’s untreated wasteload is 24,955. With respect to Illinois EPA’s withdrawn calculation for TSS, which was above 50,000, Illinois EPA now implies that Noveon improperly withheld this calculation from the Board. Resp. Mem. 14. But Illinois EPA’s witness responsible for making the P.E. calculations admitted that he incorrectly calculated the population equivalents. *See* Tr. 426-28, 442. Because

² Illinois EPA points out that it made a typographical error, disclosed at the hearing, which showed its calculation of the P.E. based on flow should have been 9,160, and not 916. This is far below the 50,000 P.E. required for application of an effluent limitation. Illinois EPA states that Noveon’s use of Illinois EPA’s typographical error “calls into question what flow P.E. Noveon thinks is the proper value as it relied entirely on the Agency’s calculations.” This is a peculiar argument for the Agency to make, as Noveon was clear that it was not going to dispute a calculation by Illinois EPA that has no consequence in that it is below 50,000.

Illinois EPA's calculation was withdrawn, the point of Illinois EPA's argument is unclear. It appears that Illinois EPA once again believes that its withdrawn calculations have some validity, and that the discrepancy between Noveon's calculation and that of Illinois EPA is of some importance. The only calculations concerning the P.E. for TSS in the record are those of Noveon. The Illinois EPA's statements on this subject are not based on evidence in the record.

The TSS figure used for Illinois EPA's calculation was 53,000 lbs/day, while the TSS figure used by Mr. Flippin was 4,991 lbs/day. Pet. Ex. 7, at 13. As noted, Illinois EPA based its calculation of P.E. on a wasteload with wastestreams that are internal to the wastewater treatment facility. Illinois EPA now states that the discrepancy in the numbers used by it and by Mr. Flippin cannot be accounted for with these internal streams. With an understanding of the wastestreams, however, an explanation of the discrepancy can easily be given. The diversion of primary sludge to the PVC tank, the primary internal stream affecting Illinois EPA's calculation, is a daily occurrence. This diversion is required anytime the filter press used for sludge dewatering is not being operated and when the filter press is not capable of receiving the entire discharge of the primary clarifier (at end of filter press cycle). The primary clarifier sludge is withdrawn continuously to prevent over-torquing of the clarifier rake mechanism.

Mr. Flippin testified that he did not include the pond water in the calculation of TSS. Nevertheless, because all wastestreams expected to have any significant levels of TSS were included, Mr. Flippin testified that his calculation of population equivalents was accurate to within 25 percent. Tr. 486-88. Illinois EPA states in its response brief that "Petitioner expects the Board to accept that this calculation might be off by no more than 25 percent of the total influent wasteload," so that the P.E. would still be substantially below 50,000. Why shouldn't the Board accept the testimony of Noveon's witness, when it is reliable and unrefuted?

Illinois EPA claims the Parkson sand filter backwash wastestream should also have been included in the TSS untreated waste load. Resp. Mem. 16. The Parkson filter backwash water is an external wastestream for the purpose of calculating population equivalents. The quantity of stormwater and utility waters entering the holding ponds, which were accounted for by Mr. Flippin, must be equal to the summation of waters exiting the ponds. The water exiting the ponds is equal to the backwash water discharging to the activated sludge treatment system, the pond water being pumped back to the activated sludge treatment system and the water that is treated by the Parkson sand filter and discharged directly to the permitted outfall (the 800,000 gpd referenced).

Illinois EPA claims without citation that Noveon has used flows that are inconsistent with past information. Resp. Mem. 17. The flows discussed represent different averaging periods. As is obvious, there is no one flowrate since the Noveon production is a batch process that varies daily. Production and the associated wastewater flowrates vary based on market demand.

Finally, in an attempt to circumvent the calculation of Mr. Flippin, Illinois EPA states that "there can be no dispute that when calculated [the P.E.] value does not correspond to the enormous ammonia loading Petitioner's facility is discharging to the Illinois River as would be represented by a P.E. value for a POTW." Resp. Mem. at 17. This statement is again unsupported by citation to the record and is therefore not credible. In addition, the claim is incorrect. The Noveon-Henry Plant discharges an effluent ammonia-nitrogen load less than exempted by the Board in 304.122(a). A Population Equivalent of 50,000 people would generate 1,450 lbs/day of TKN and 950 lbs/day ammonia-nitrogen based on factors of 0.029 lbs/day per capita TKN and 0.019 lbs/day per capita ammonia-nitrogen according to Metcalf and Eddy, Inc, Wastewater Engineering: Treatment and Reuse, Fourth Edition. Pet. Ex. 7, at 13. The Board

would not have excluded “enormous” discharges from the regulation. The Noveon Henry Plant’s untreated wasteload would yield a population equivalent of 20,263 for ammonia nitrogen and 35,793 for TKN, which are well below 50,000 if those parameters were used to calculate P.E. Pet. Ex. 7 at 13.

C. Noveon Has Met the Factors for Issuance of an Adjusted Standard

Noveon meets each element of 35 Il. Adm. Code 104.427 for the Board to grant the requested adjusted standard. Ammonia from Noveon’s plant is not removed by the conventional treatment, nitrification, considered by the Board in adopting Section 304.122(b), and there is no economically reasonable and technologically feasible alternative available to Noveon for ammonia treatment. Nevertheless, Noveon’s wastewater will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting Section 304.122(b), and specifically will not adversely impact dissolved oxygen in the Illinois River. Finally, the adjusted standard is consistent with federal law in that Section 304.122(b) is purely a state effluent standard and there will be no violation of water quality standards if the relief requested is granted.

D. No Treatment Technology Is Technically Feasible and Economically Reasonable

Noveon pointed out in its opening memorandum that, in adopting Sections 304.122(a) and (b), the Board explicitly found that “present technology is capable of meeting this limit and should result in the removal of much ammonia nitrification oxygen demand (NOD) from the stressed waterways,” and explicitly cited nitrification as the treatment method it considered. *See Order of the Board*, R 72-4 (Nov. 8, 1973); *See Order of the Board*, R 70-8, 71-14, 71-20 (Jan. 6, 1972). The factors that govern ammonia-nitrogen removal at the Noveon-Henry Plant are

substantially and significantly different from those relied upon by the Board in adopting the general regulation. As presented at the hearing, these factors are that the Noveon-Henry Plant:

- has a unique wastewater. There are only three other plants in the nation that make the same product line. Only one of these facilities has a direct discharge of treated wastewater to a receiving stream and this at a much lower contribution of this wastewater. The other two plants discharge to a Publicly Owned Treatment Works (POTW) at a low flow contribution.
- uses a compound as a building block in the Noveon plant's production (MBT) that is known for preventing nitrification (biological conversion of ammonia-nitrogen to nitrate-nitrogen). This quality has led to the use of this compound in fertilizers to prompt greater use of nitrogen by plant life and not bacteria in the soil. There is no substitute for this compound in the production process.
- requires pretreatment upstream of the activated sludge process to remove bio-inhibiting compounds so that adequate BOD removal can be accomplished and to remove solids that would pass-through the activated sludge process. This requirement renders the activated sludge process subject to upset and noncompliance with effluent BOD and TSS limits. This characteristic of the Noveon wastewater renders a wastewater treatment facility less reliable in its performance than anticipated by the Board when adopting 304.122.
- exhibits a net increase of ammonia-nitrogen through the wastewater treatment process by conversion of organic nitrogen compounds to ammonia-nitrogen. Consequently, as the degradation of organic nitrogen compounds increase through the wastewater treatment process (a desired outcome), the effluent ammonia-nitrogen increases (an undesirable outcome).
- contains compounds in its wastewater that reduce its oxygen transfer capacity to approximately half that experienced in a POTW. Consequently, the Noveon-Henry Plant provides about twice the amount of aeration equipment required by a POTW to satisfy the same oxygen demand of the wastewater.
- would be required to add the bulk of alkalinity consumed if nitrification were provided at the facility. This is in contrast to a POTW where essentially all the alkalinity required for nitrification is found in the wastewater.
- has an effluent whose primary toxicant, in addition to ammonia-nitrogen, is salt. All treatment processes that provide significant ammonia-nitrogen removal require either salt addition or salt release. Thus, an attempt to reduce one effluent toxicant, the concentration of the other effluent toxicant is increased.

- has used practically all power available to the wastewater treatment facility. Any additional power requirements will need to be supplied by a new line from a substation located approximately 0.5-mile away.

Pet. Ex. 7, at 15-17. Combined, the above factors make ammonia-nitrogen removal at the Noveon-Henry Plant much more complex and expensive than the Board envisioned when adopting Section 304.122, and more complex and expensive than suggested by the Illinois EPA.

With respect to source control, Noveon pointed out in its opening memorandum that it has implemented source control measures that have reduced ammonia-nitrogen in its final effluent, although the exact amount of ammonia removed cannot be quantified, and Noveon has received numerous Annual Governor's Awards for Pollution Prevention and a Governor's Citation Award for Pollution Prevention. Pet. Ex. 6, at 6-10; Pet. Ex. 7, at 28. Combined this work led to removal of approximately 377,000 lbs/year of organic nitrogen-containing material from the sewer. Illinois EPA claims that because a correlation between these removal efforts and ammonia reduction cannot be made, it is misleading to connect these efforts with an effort to reduce ammonia levels. This accusation is not supported by fact. The fact is, without these source control efforts, a portion of this material would have been removed through primary treatment as a solid or lost to the atmosphere as a volatile in the treatment system. A portion (if not all) of the material entering the activated sludge system would have been bio-hydrolyzed to ammonia-nitrogen and discharged as ammonia-nitrogen in the final effluent. One of these projects involved reducing the tertiary butyl amine (a soluble compound) loss to the sewer by 185,000 lbs/year. Assuming all of this material remained in solution (not lost to the atmosphere), the ammonia-nitrogen that would be generated in the activated sludge treatment system was reduced by approximately 35,500 lbs/year or 97 lbs/day or 15 mg/L at a flow rate of 800,000 gpd. The other 192,000 lbs/year of product recovery would have also reduced the ammonia-

nitrogen generated in the activated sludge treatment system and subsequently discharged in the final effluent. The extent of this effluent ammonia-nitrogen reduction is related to the nitrogen content of the material, volatility of the organic nitrogen present, phase that the material is present (soluble or solid), solubility of the material in water, and ease of bio-hydrolysis of the material. With these factors influencing the fate of organic nitrogen, Noveon has not attempted to develop correlations in product recovery and effluent ammonia-nitrogen. Further, Illinois EPA completely writes off Noveon's efforts, again without supporting testimony, by claiming that Noveon's efforts were more likely intended to assure compliance with BOD and TSS limits than reduce ammonia-nitrogen. The fact that Noveon has undertaken these measures and that these measures have reduced effluent ammonia-nitrogen seems to have no importance to Illinois EPA. The Board should take no notice of Illinois EPA's argument, which does not challenge the relevance of Noveon's efforts to the relief requested.

Illinois EPA states that "Noveon has reviewed approximately eight potential post treatment compliance options." Resp. Mem. 19. This is incorrect. Noveon has actually reviewed, treatability tested (where needed), and developed conceptual level designs and cost estimates for eleven potential treatment alternatives, not eight, and not all were post-treatment alternatives. Pet. Exs. 7, 11, 13. Illinois EPA further claims that the evidence presented at the hearing shows that some of these alternatives are technically feasible alternatives available for the treatment of ammonia. Resp. Mem. 21. Noveon believes Illinois EPA is defining technical feasibility as simply whether a technology can be built. Resp. Mem. 21, citing Tr. 118. But technical feasibility as considered and testified to by Mr. Flippin involves more than the question of whether a technology can be installed. It also involves reliability, difficulty in operations and maintenance, costs, and benefits. Using these criteria, all processes considered had reliability

concerns, all were costly, none would achieve consistent compliance with the effluent standard of 35 Il. Adm. Code 304.122(b), and most importantly, would not impact the water quality of the Illinois River. Further, all treatment processes that provide significant ammonia-nitrogen removal require either salt addition or salt release. The attempt to reduce one effluent toxicant, ammonia, would increase the concentration of the other effluent toxicant, salt, for many of the treatment alternatives. See Pet. Ex. 13, Comparison of Removal and Reliability of Effluent NH₃-N Removal Processes.

Noveon's expert witness, Houston Flippin, also provided cost information for each treatment alternative evaluated, using both a ten-year and twenty-year lifespan. Pet. Ex. 13. Illinois EPA claims that "there are treatments available that could achieve at least partial compliance with 304.122(b) for an economically reasonable cost," although Illinois EPA declines to identify the treatments to which it refers. Resp. Mem. 22. Noveon does not agree, and Noveon submitted ample information to show that treatment alternatives were technically infeasible, economically unreasonable, or both, and the costs of treatment would have an adverse financial impact on Noveon's Henry facility and threaten its viability. See Pet. Ex. 11-13, 33, 35. Illinois EPA tries to criticize Mr. Flippin's credibility and expertise on the issue of cost estimates. Resp. Mem. 22. Such criticisms are baseless and unsupported by any evidence presented by Illinois EPA. In fact, none of Illinois EPA's witnesses has ever designed wastewater treatment technology, let alone developed capital and operating and maintenance costs for such systems.

Mr. Flippin has developed cost estimates throughout his entire 20-year career for wastewater treatment processes. He has worked with other Brown and Caldwell staff, vendors, and contractors (as needed) to develop these costs. He has run cost models and done "hands on"

cost estimating. For Noveon, Mr. Flippin was responsible for making sure that reasonable cost estimates were developed for the treatment alternatives. He used other Brown and Caldwell staff to gather information and literally run the cost models. Mr. Flippin provided the information on which the cost estimates were based, and understood and reviewed the work of his staff. As such, Mr. Flippin was more than competent to testify as the wastewater treatment expert witness in this case, and his testimony and supporting exhibits went virtually unchallenged at hearing. Tr. 120-21.

The figures Noveon used to arrive at the cost of each treatment alternative were based on specific, verifiable information that has been provided to the Board. Illinois EPA argues that Noveon's figures "serve[] to inflate the capital costs of these alternatives," yet Illinois EPA supplied no testimony on this issue. The cost figures used by Noveon were neither intended to nor resulted in an inappropriate or improper representation of the costs that would be incurred by Noveon for each treatment alternative. Illinois EPA implies that Mr. Flippin should have used a cost of labor figure of \$22/hour, instead of \$40/hour, because Noveon's hourly workers typically earn the lower figure. Guy Davids, who provided this figure to Mr. Flippin, explained how the \$40/hour figure was arrived at. Wastewater operators are the most senior staff so their salary is more than \$22/hour. Noveon also contributes to insurance, retirement, and other benefits. Tr. 287-88. To ignore these additional costs per employee would result in an inaccurate picture of the costs Noveon would incur.

Illinois EPA is also "disturbed" that Noveon has not taken into account that PolyOne typically contributes approximately 55 percent of the cost of operation of the wastewater treatment facility, and states that "it is unreasonable to ask the Board to assume that the former portion of the BF Goodrich plant now owned by a different corporate entity would not contribute

significantly to these costs and thereby reduce the economic burden on Noveon.” Resp. Mem. 24. In fact, any assumption to the contrary would be unreasonable. The cost that PolyOne currently pays for the wastewater treatment facility has already been taken into account in the information supplied by Noveon concerning the financial impact on the Henry Plant of the cost of various treatment alternatives considered by Houston Flippin, because Ms. Shaw used net figures in her analysis. Tr. 278-79. Illinois EPA entirely ignores the testimony on this point, which is that PolyOne is not obligated to pay the capital cost of any improvements to the wastewater treatment facility or any costs of additional ammonia removal. Tr. 299. Illinois EPA states without citation that “PolyOne also contributes to the high levels of ammonia in the final discharge.” Illinois EPA is wrong on this point. This claim ignores the testimony that the primary source of the levels of ammonia found in the effluent is the bio-hydrolysis of amines from Noveon’s processes, not from PolyOne, and it is primarily this amine-derived ammonia that is present in the final discharge, not the small amount of amount of ammonia discharged from PolyOne.

Illinois EPA’s Response Memorandum contains an economic analysis originally reported by Illinois EPA in its Recommendation. As stated above, Noveon believes this argument should be stricken because an unsupported agency recommendation is not evidence. Even if the Board considers this argument, and it should not, the Recommendation’s economic analysis was severely flawed. The Recommendation argued that Noveon’s costs were not economically unreasonable when considered on a per pound basis, based on the large amounts of ammonia being removed from the final discharge. Resp. Mem. 20. But the Illinois EPA analysis did not consider operating and maintenance costs, which represented between 49 percent and 94 percent of the present worth cost (using a 20-year life) depending upon the alternative selected. Pet. Ex.

13. The normalized cost for these treatment alternatives range from \$1.08/lb NH₃-N removed to \$18.90 per pound of ammonia removed (using a 20-year design life) as compared to a POTW surcharge of \$0.12 per pound of ammonia. This is a 9-fold to 157-fold difference. Illinois EPA did not conduct a proper cost analysis in concluding that the ammonia-nitrogen control options for the Noveon-Henry Plant are not economically unreasonable.

On the topic of POTWs, Mr. Flippin provided testimony to show that the cost for single stage nitrification per pound of ammonia removed for Noveon was vastly in excess of that for POTWs. This comparison was intended to put the costs Noveon would incur in context, providing further evidence of the economic unreasonableness of the various treatment options. Mr. Flippin cited from his experience the surcharge imposed by the Knoxville Utility District and that surcharges are intended to recover the cost of treatment. The surcharge rate of \$0.12/lb is 19-fold lower than the present worth cost (20-year design life) required by the Noveon-Henry Plant to achieve the same treatment (single stage nitrification). Illinois EPA claims, without citation to any support, that this comparison was "suspect" because a municipality surcharge takes into account a variety of factors including instituting a disincentive above the usual cost of treatment to discourage compounds that might overload the plant or a desire to encourage local industry through provision of infrastructure services. Mr. Flippin, however, testified that the purpose for a surcharge is to recoup costs. Tr. 115-116. Further, even in Illinois, the Illinois Sanitary District Acts allow a tax "for the purpose of paying the costs of operation of the chlorination of sewage, or other means of disinfection or additional treatment as may be required by water quality standards approved or adopted by the Pollution Control Board or by the court," and not as a disincentive. 70 ILCS 2205/17; 70 ILCS 2805/16.

Illinois EPA's neglect of operating and maintenance costs in its cost comparisons was a

gross oversight and produced a biased analysis. Illinois EPA argues that including operating costs for a 10-year and 20-year life span would have been offset by an attendant decrease in capital costs. This claim is not supported by testimony but in any case is not accurate. Mr. Flippin presented present worth cost estimates based on both 10-year and 20-year design basis in his testimony. Capital costs were presented throughout Mr. Flippin's testimony as present worth costs and, as such, did not change as a function of design life.

Illinois EPA also suggests that because nitrification of PVC tank wastewater would not generate a negative return on revenue and on net plant, property and equipment, it should be implemented, even if it would not result in compliance. However, this alternative provided only an estimated 27 percent reduction in effluent ammonia-nitrogen load, with a reliability rating of 8, so that 20% of the time it would not achieve this ammonia reduction. See Pet. Ex. 13, Comparison of Removals and Reliability, at Page 1 of 4. Noveon believes the Board has no reason to require such an inconsistent or substantially incomplete compliance alternative.

Illinois EPA states explicitly that granular activated carbon was dismissed too quickly by Noveon. Resp. Mem. 20-21. Noveon explained the reason for dismissing this alternative at the hearing. Tr. 165-67. If Noveon dismissed granular activated carbon too quickly, it was because this treatment method would have required removal of total suspended solids from Noveon's waste stream prior to placing it through a granular activated carbon column, and would have required a tremendous amount of carbon in the multiple tons per day. Compounding these problems, because of the nature of the wastewater, placing it in a carbon column would have caused sliming over of the column, as well as scaling from the salt. Tr. 167.

Noveon does not need to provide further reduction in effluent ammonia-nitrogen since it will meet all water quality criteria with the multiport diffuser it has agreed to install. And the

unrefuted testimony from Guy Davids is that, from a business standpoint, the cost of treatment would impact the long-term viability of this facility, and this facility would have a difficult time attracting new product lines. There is no need to provide treatment for "treatment's sake" alone. This is technically unjustifiable.

E. No Adverse Water Quality Effects Will Result from the Adjusted Standard

As part of the relief, Noveon provided expert evidence and verifiable information that the proposed relief will not have an adverse impact on water quality. Noveon also asked the Board to provide for a mixing zone. Noveon's evidence showed that ammonia water quality standards are met in the Illinois River with the existing diffuser and would be met in a similar downstream distance with the multiport diffuser, and Illinois EPA's testimony supports this. The Illinois EPA's witness on water quality, Mr. Robert Mosher, concluded that based on water quality data showing ammonia concentrations at a station down stream from Noveon at levels lower than the upstream station, it is possible that "the relatively small increase in ammonia concentration caused by BF Goodrich is naturally nitrified by the time the river flow reaches the next downstream station." Illinois EPA Ex. 1 at 3. Similarly, dissolved oxygen in the Illinois River is currently at or near saturation and the water quality standard for dissolved oxygen is being met. Noveon's expert evidence therefore provided conclusive evidence that the adjusted standard will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting the rule of general applicability. Pet. Ex. 16, at 3.

Illinois EPA's response on the issue of water quality is confusing and contradictory. On the one hand, Illinois EPA argues that it would not support relief from compliance with Section 304.122(c), which in turn requires compliance with the requirement in Section 304.105 that Noveon's effluent may not be permitted to cause a violation of water quality standards. Resp.

Mem. at 8, 9. Yet, Illinois EPA later states that “Petitioner nevertheless is asking the Board to go beyond granting adjusted standard relief from a technology based effluent limit of 304.122, to request a declaratory judgment that the Illinois EPA must accept the mixing zone and ZID calculated by Noveon and find that the water quality standards will be met.” Noveon believes it is entirely appropriate for the Board to grant a mixing zone, and indeed, based on the only credible evidence in the record, the Board must make the finding that water quality standards will be met. Noveon has presented a substantial and uncontroverted case that no water quality violation will occur if the requested relief is granted.

Noveon also provided detailed information at the hearing and in its opening brief using established scientific procedures to show how the mixing zone actually works in the Illinois River. Given the rapid mixing that physically occurs in the Illinois River, Noveon’s discharge is effectively dispersed into the Illinois River, and there is no impact to aquatic life from Noveon’s discharge. Pet. Ex. 16 at 4, 6. Noveon believes that the standard for an adjusted standard requires just that: an examination of *actual* environmental and health effects. An understanding of the actual mixing zone is also important because the “regulatory” mixing zone can be presumed to be intended to get at exactly how mixing zones work in fact. Illinois EPA responds with concern that a discussion of the actual mixing zone might “confuse[] the reader” with respect to “regulatory mixing zones.” Resp. Mem. 27. Noveon believes the opposite is true. An understanding of the actual mixing zone can only serve to assist the Board in understanding why this regulatory provision is necessary and appropriate, and how it should be applied.

In addition to modeling work, Noveon performed an in-stream study in 1989 to determine effluent dispersion into the Illinois River using conductivity, or salt, as a surrogate to project effluent effects on the river. Tr. 218, 219. Illinois EPA claims that Noveon completed no in-

stream studies. The claim completely ignores the 1989 work. Resp. Mem. 26. This study provides additional evidence that Noveon's discharge has no adverse impact on the river within a short distance downstream from the existing effluent diffuser.

The purpose of Noveon's request for a mixing zone is to provide the condition for the Board to make the finding that no adverse effects on the environment will result from the Board's grant of an adjusted standard. With respect to the "regulatory mixing zone," Noveon meets the requirements at 35 Il. Adm. Code 302.102 for the Board to grant a mixing zone, and also meets the requirements of U.S. EPA's and Illinois EPA's regulatory guidance documents. *See Technical Support Document for Water Quality-Based Toxics Control* (U.S. EPA March 1991) ("TSD"), Hearing Officer Ex. 1; *Illinois Permitting Guidance for Mixing Zones* (April 23, 1999), Ex. to Resp. Mem.

Noveon argued that, with respect to the initial requirement for a mixing zone, Noveon provides "best degree of treatment" (BDT) of wastewater. The prior sections of this memorandum address Noveon's efforts to address ammonia. The Illinois EPA seems to be arguing that the Board may not grant a mixing zone because Noveon has done nothing to address ammonia and therefore does not provide BDT. This is not the case. Noveon has completed substantial source reduction by reducing amines, and has constructed a fully equipped nitrifying facility, meeting the technology requirements of the Ten State Standards and Illinois regulations at 35 Il. Adm. Code 307.1210 and 370.920. See Tr. 420. Through no absence of equipment or flaw in design, the wastewater treatment facility simply does not perform the treatment that it would absent influent bio-inhibiting compounds. Furthermore, Noveon does provide treatment at the source to recover product and materials from the production wastewaters. This treatment does reduce the ammonia in the final effluent. Nitrification is the objective standard for

ammonia treatment, and by this fact alone, the Board can find that Noveon is providing BDT. But Illinois EPA's claims with respect to how BDT is determined, that a facility must provide treatment, are incorrect as a matter of practice (Noveon does provide treatment) and law.

The determination of the Zone of Initial Dilution (ZID) continues to be a matter of dispute between the parties. The Board's regulations require "rapid and immediate mixing." See 35 Il. Adm. Code 302.102. The Board's regulations also state that mixing zones can only take up to 25% of the width of the river. Noveon's proposed ZID meets these requirements. Illinois EPA has added an additional requirement to the Board's regulations, claiming that the ZID is limited to 10% of the 25% allowable width of the ZID, by adding a TSD limitation for ZIDs to 10% of the mixing zone on top of the Board regulations for ZIDs, so that Mr. Mosher calculates that the ZID is limited to 2.5 percent of the width of the river. This results in a ZID of 22.5 feet. Tr. 341-42; 384-87.

Noveon disagrees with Illinois EPA's peculiar application of the Board's regulations to U.S. EPA's TSD to derive this width limit. Noveon pointed out that its method to calculate mixing zones is based on Board regulations and has precedent in several past Illinois EPA grants of mixing zones in which Noveon's expert was involved. Illinois EPA claims in its memorandum that the regulatory mixing zones cited by Noveon were for high-rate multiport diffusers which meet the 3 m/sec port exit velocity. Resp. Mem. 28, 29. The regulatory language for both a high-rate multiport diffuser and a diffuser that does not meet the 3 m/sec port exit velocity are the same, and they do not allow Illinois EPA to apply a different methodology or unique interpretation for a single port diffuser. Illinois EPA also claims that it has been very consistent in its interpretation of mixing zones over the last 12 years. Resp. Mem. 30. To evaluate this statement would require extensive investigation, but it does not appear to be the

case based on other mixing zones Illinois EPA has granted, as described in Mr. Corn's testimony and not refuted by the Illinois EPA. Tr. 221.

Illinois EPA's most grossly misleading statement is that "[i]f adopted by the Board, the interpretation of the federal TSD used by Noveon would allow for a larger ZID in a smaller river, while the Agency's method allows larger ZIDs in larger rivers and the smaller the river the smaller the ZID." This is simply false. For small streams, the TSD has a limit of the mixing that can be used for mixing zones with multipoint diffusers, and there are other more limiting requirements for diffusers that meet less than 3 m/sec port exit velocity. TSD, Hearing Officer Ex. 1 at 70, 71. There are limits on the size in Illinois EPA's mixing zone guidance document depending on the size of the stream. Resp. Mem. Ex. 1. Noveon's interpretation is both legally and factually correct and consistent with protecting small streams.

From a technical stance as well, the protective (conservative) basis of development of water quality criteria and resulting standards use "safety factors," ensuring that correctly assigned mixing zones and ZIDs are adequately protective of aquatic life. Illinois EPA, in its Response Memorandum, repeats Mr. Mosher's testimony that "when a mixing zone and ZID are granted, that means the standards won't be met. The standards are based on toxic effect to aquatic life . . . And when you allow those areas in the river to not meet the standards . . . there is an impact to aquatic life." Resp. Mem. 29. These statements on mixing zones and ZIDs are not based on sound science and regulatory practice. The protectiveness to aquatic life is the entire premise of the U.S. EPA's TSD. The water quality criteria and resulting standards are developed in a very prescriptive manner, using a sufficient database of many different aquatic life orders, families and genera, and are intended to be protective of fish, aquatic invertebrates (including clams and mussels) and even plants. The water quality standards that are developed are also

based on fully mixed situations, because toxicity is concentration and exposure time in concert. To evaluate toxicity you need to look at both together, which the Illinois EPA's approach fails to do.

F. The Toxicity of Noveon's Discharge Has Been Adequately Assessed by Noveon

At the hearing and in its Response Memorandum, the Illinois EPA also made the inflammatory and unsupported claim that Noveon's discharge is "the single most toxic discharge" to the waters of the State. Resp. Mem. 25. This statement was based only on the LC50 value. Besides being inflammatory and extremely objectionable, the claim is incorrect. Toxicity rankings can only be performed if you determine the toxicity at the edge of ZID and mixing zones to give the level of magnitude of toxicity on a normalized basis. Since Noveon's effluent is going to a large receiving stream, and is subject to considerable mixing, it cannot be "the most toxic." If so, the Illinois River would have routine fish kills, which no evidence supports has occurred. Illinois EPA's claim is a subjective statement that is not supported by the data.

Noveon provided information showing that it has performed complete testing to determine any toxic parameters in its effluent. Testing of the toxicity of Noveon's discharge was performed following established U.S. EPA protocol by Mr. William Goodfellow, Noveon's expert on toxicity. See Pet. Ex. 29, *Results of an Acute Toxicity Evaluation*, EA Engineering (March 1999), and Pet. Ex. 31, *Written Expert Testimony of William L. Goodfellow*. The testing included acute and chronic toxicity tests in two rounds of testing on Noveon's effluent, as well as a Toxicity Identification Evaluation (TIE) on the most toxic of the samples taken in order to characterize and potentially identify the specific toxicant in the effluent. The TIE provides

information on organic toxicity, ammonia toxicity, metal toxicity, oxidant toxicity, and reducible compounds. Tr. 248.

As Noveon reported to Illinois EPA, toxicity in the wastewater as determined by the TIE was associated not only with ammonia in Noveon's wastewater, but also with salinity, or total dissolved solids ("TDS"). Pet. Ex. 31 at 6-8; Tr. 247-48, 253-55. Illinois EPA has not addressed the fact that toxicity will remain for salinity even if ammonia could be removed, and there is no dispute that Illinois regulations do not require treatment for TDS in Illinois, since technically feasible methods are in general not economically reasonable, and the Illinois EPA agrees with this. Tr. 398. Pet. Ex. 36.

Mr. Goodfellow concluded that no other toxicants were determined from these standard test procedures to be "hiding in the weeds." Tr. 470-71. Illinois EPA's Response Memorandum implies that Noveon still does not understand the overall toxicity of the effluent and should have done more testing, citing Mr. Mosher's testimony that "when you do that kind of testing [performed by Mr. Goodfellow], you always take the trouble to do a definitive test; you always bring the dilutions down to the level of disappearance of toxicity." Resp. Mem. 25. Mr. Goodfellow performed the toxicity testing requested by Illinois EPA in the NPDES permit it issued to Noveon and testing approved and recommended by U.S. EPA. This testing was acute toxicity testing. To be even more protective than was required under the NPDES permit, longer exposure periods and more sensitive endpoints than only survival (growth and reproductive potential) were used to give better information as to the cause of the toxicity. Mr. Goodfellow testified that his testimony and professional judgment remains that the toxicity is ammonia and total dissolved solids. No additional toxicity was observed from heavy metals or organic compounds as determined in the TIE.

The fact that Mr. Goodfellow did not perform the testing sought by Mr. Mosher is moot, because Mr. Goodfellow was trying to determine the toxicants in the effluent by the process of parameter elimination or rendering the toxicant biologically unavailable. Mr. Mosher's claim that dilutions should be brought down to the level of disappearance of toxicity is true for compliance testing, where a test is run at the specific compliance point. The work that was done by Mr. Goodfellow was not compliance testing. Tr. 251. Mr. Goodfellow did perform the tests described by Mr. Mosher for the acute testing that was requested by the Illinois EPA. The chronic testing was only performed to get an even more sensitive signal of toxicity for the TIE and to make sure that the conclusions were very confident in the characteristics of the specific toxicants. Tr. 244-51.

IV. Conclusion

Noveon asked for the following relief to be granted by the Board:

Noveon, Inc. ("Noveon") is hereby granted an adjusted standard from 35 Ill. Adm. Code 304.122. Pursuant to this adjusted standard, 35 Ill. Adm. Code 304.122 shall not apply to the discharge of effluent into the Illinois River from the Noveon plant located at 1550 County Road, 850 N., in Henry, Illinois as regards ammonia nitrogen. The granting of this adjusted standard is contingent upon the following conditions:

- A. Noveon shall not discharge total ammonia nitrogen at concentrations greater than 225 mg/l from its Henry, Illinois plant into the Illinois River.
- B. Discharge into the Illinois River shall occur through a diffuser that is at least 15 ft. in length, with 9 two-inch ports, angled at 60 degrees from horizontal, co-flowing with the river, designed to achieve an effluent dispersion of 43:1.

Based on a plain reading of the regulation and the Board's opinions adopting Section 304.122(a) and (b), Illinois EPA's application of Section 304.122(b) to require an effluent limit was erroneous. The only credible and admissible evidence in the record establishes that Section