BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
Petition of Emerald Performance	)	
Materials LLC for an Adjusted	)	AS 13-2
Standard from 35 Ill. Adm. Code	)	(Adjusted Standard)
304.122(b)	)	

NOTICE OF FILING

TO: Clerk, Illinois Pollution Control Board
State of Illinois Center
100 West Randolph Street
Suite 11-500
Chicago, IL 60601

Illinois Environmental
Protection Agency
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

PLEASE TAKE NOTICE that on **Friday, September 28, 2012**, we filed the attached **Petition for Adjusted Standard** with the Clerk of the Illinois Pollution Control Board, a copy of which is herewith served upon you.

Respectfully submitted,

Emerald Performance Materials LLC

Roy M Harsch

By: _____
One of Its Attorneys

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THIS FILING IS SUBMITTED ON RECYCLED PAPER

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Notice of Filing and Petition for Adjusted Standard** was filed by hand delivery with the Clerk of the Illinois Pollution Control Board and served upon the parties to whom said Notice is directed by first class mail, postage prepaid, by depositing in the U.S. Mail at 191 North Wacker Drive, Chicago, Illinois 60606 on **Friday, September 28, 2012.**

Roy M Harsch

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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Petition of Emerald Performance	)	
	)	AS 13-2
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Standard from 35 Ill. Adm. Code	)	
	)	
304.122(b)	)	

PETITION FOR ADJUSTED STANDARD

Emerald Performance Materials LLC. ("Emerald") through its undersigned attorneys, respectfully petitions the Illinois Pollution Control Board ("Board") for a renewal of the adjusted standard previously granted pursuant to 35 Ill. Adm. Code 104 and Section 28.1 of the Illinois Environmental Protection Act ("Act") in *Petition of Noveon, Inc. for an Adjusted Standard from 35 ILL. ADM. Code 304.122*, AS-2002-005 (Nov. 4, 2004) ("AS 02-5"). Specifically, Emerald requests an adjusted standard from the total ammonia nitrogen as nitrogen (N) effluent standard in 35 Ill. Adm. Code 304.122(b) for the effluent from the wastewater treatment plant at the Emerald chemical manufacturing facility located at 1550 County Road 1450 N., in Henry, Illinois ("Henry Plant"). As will be explained below, Emerald requests that this relief also be made applicable to PolyOne Corporation ("PolyOne").

INTRODUCTION

As more fully explained below, Emerald is the successor owner and operator of the specialty chemical facility at the Henry Plant which was originally built by B.F. Goodrich Company ("B.F. Goodrich"). In 1993 B.F. Goodrich divested its Geon Vinyl Division and

formed The Geon Company ("Geon"), a separate, publicly held company who thereafter owned and operated the poly-vinyl chloride ("PVC") resin portion of the B.F. Goodrich Henry chemical plant until it consolidated with the M.A. Hanna Company on August 31, 2000 forming PolyOne. PolyOne continues to own and operate the PVC resin production plant.

In February 2001 B.F. Goodrich sold the remaining assets of its chemical business, including the Henry Plant, to Noveon, Inc. ("Noveon") who in June of 2004 completed the December 23, 2003 sale of a portion of its specialty chemical operations, including the Henry Plant, to The Lubrizol Company ("Lubrizol"). Emerald has owned and operated the Henry Plant since Lubrizol sold the plant to a new owner on May 1, 2006. The new owner formed Emerald Performance Materials, LLC to own and operate five specialty plants, including the Henry Plant.

Both the PVC resin and specialty chemicals portions of the original B.F. Goodrich plant have remained mainly unchanged, despite this history of corporate ownership with only limited curtailment and replacement of individual products. Over the past twenty-one years there have been three cases filed with the Board regarding the Henry Plant discharge to the Illinois River that have concerned the application of ammonia nitrogen effluent limitations.

BACKGROUND OF PRIOR BOARD PROCEEDINGS

On January 24, 1991, B.F. Goodrich filed an appeal of renewed NPDES Permit No. IL0001392 governing the wastewater discharge from the Henry Plant in which the Illinois Environmental Protection Agency ("Agency") included an ammonia (N) effluent limitation of 3.0 milligram per liter ("mg/L") for ammonia (N) based on 35 Ill. Adm. Code 304.122(b) that had not been included in previous permits ("PCB 91-17"). B.F. Goodrich's principal argument in this appeal was that Subpart (a) not (b) of Section 304.122 was applicable to the Henry Plant

because the plant's untreated waste load could be readily calculated under 35 Ill. Adm. Code 304.122(a) on a population equivalent ("PE") basis.[1]

Following the conclusion of two hearings in November and December of 1991, it was agreed that the appropriate course of action would be for B.F. Goodrich to file a variance petition with the Board. This would enable B.F. Goodrich to review and evaluate process modifications and treatment alternatives that might reduce the level of ammonia in the wastewater discharge. Consequently, Permit Appeal PCB 91-17 was stayed by agreement of the parties through a series of decision deadline waivers, with periodic status reports to the Board. A variance petition was filed on October 30, 1992 by Noveon which had by then purchased the Henry Plant from B.F. Goodrich. This petition was accepted by the Board and docketed as PCB 92-167. The variance proceeding was also similarly stayed by agreement.

While both these petitions were pending, different aspects of ammonia reduction and treatment technologies that could possibly reduce the ammonia concentration in the Henry Plant discharge continued to be reviewed and evaluated. In addition, internal studies of possible actions to eliminate, recover or recycle the precursors to total ammonia contained in the Henry Plant wastewater were carried out. Over the next seven plus years a number of meetings with the Agency were held to review this work. Based on this work and the evaluation of the various options reviewed, it was concluded in 1998 that none of the available treatment technologies were both economically reasonable and technically feasible to implement in order to

[1] Ammonia (NH_3), ammonia (N), ammonia as N, total ammonia nitrogen as N, ammonia nitrogen (NH_3 expressed as N), total ammonia nitrogen, total ammonia nitrogen (as N: STORET Number 00610) and total ammonia-nitrogen (NH_3 plus NH_4^+ expressed as N) are used interchangeably throughout the petition and standard and they all refer to the subject of the rule-total ammonia-nitrogen as N.(NH_3 plus NH_4^+ expressed as N).

significantly reduce the ammonia in the wastewater from the Henry Plant to a level that would achieve compliance with Section 304.122(b). Because a variance relief requires eventual compliance with the standard from which relief was requested, it was agreed that pursuing an adjusted standard from the Board was appropriate and this was communicated to the Board during a status conferences in July of 1998. Discussions continued with the Agency regarding the adjusted standard relief while review of possible technical solutions continued to be conducted and an initial draft adjusted standard petition was prepared and sent to the Agency for review and comment. A Petition for an Adjusted Standard was filed on May 22, 2002 which was accepted by the Board and docketed as AS 02-5. Withdrawal of the Variance Proceeding PCB 92-167 was approved on June 20, 2002. Discussions continued for the next six months regarding the Adjusted Standard in an attempt to resolve the remaining Agency concerns. By the end of 2002, it was determined that differences regarding ammonia relief could not be resolved. Accordingly, in January 2003 the parties reported in status conferences that neither the Permit Appeal PCB 91-17 nor the Adjusted Standard AS 02-5 would settle and hearings would be required. The Agency filed its Recommendation in opposition to the requested Adjusted Standard in June of 2003 and discovery proceeded. Three days of separate hearings were held on February 17, 18 and 19, 2004 in the Permit Appeal, 91-17 and Adjusted Standard 02-05.

The Board issued its decision on September 16, 2004 in Permit Appeal 91-17 which upheld the Agency decision regarding the inclusion of ammonia (N) effluent limits in the NPDES permit finding that Section 304.122(b), not Section 304.122(a), applied to Noveon's discharge. The Board also found that Noveon had not shown that its level of treatment constituted Best Degree of Treatment ("BDT") and therefore, dilution was not allowed.

The Board granted adjusted standard relief in AS 02-5 from the Section 304.122(b) ammonia effluent limitation on November 4, 2004. The Board found that the quality and composition of the wastewater produced in the Henry Plant manufacturing process was substantially and significantly different than wastewaters of other industries and POTWs because the presence of mercaptobenzothiazole ("MBT"), a chemical used in the manufacturing processes, inhibits the growth of nitrifying bacteria. The Board found that it had not anticipated the specialty chemicals manufacturing processes employed at the Henry Plant when it promulgated the ammonia (N) effluent limit set forth in Section 304.122(b). The Board found that Henry Plant's wastewater discharge was fundamentally different than that of the other industrial dischargers which it required to comply with Section 304.122(b) in 1972 because the MBT inhibited nitrification of the ammonia in its wastewater treatment system. The Board further held that the Henry Plant provided BDT and qualified for a mixing zone and zone of initial dilution ("ZID") pursuant to Section 302.102 of the Board's mixing zone regulations. However, the Board did not designate a mixing zone and ZID as part of the granted relief but rather directed this decision to be made by the Agency.

The Board found that no treatment alternative was both economically reasonable and technically feasible. The Board noted that while the costs per pound of ammonia nitrogen removed for the various alternatives investigated were significantly less than technologies investigated and implemented in other site-specific rulemakings by facilities that reduced their ammonia nitrogen effluent concentrations to more acceptable levels, the overall cost of reducing ammonia nitrogen would be significantly higher due to the large quantity of ammonia that must be removed to meet Section 304.122(b). The Board found that this overall cost would adversely impact the Henry Plant. Finally, the Board found that the Henry Plant's discharge of ammonia did not have an adverse environmental impact on the Illinois River. A copy of the Board's

November 4, 2004 Opinion and Order in AS 02-5 is included as Exhibit 1 to this Petition and is incorporated herein by reference.

The Board imposed a number of conditions including limiting the Henry Plant discharge to not more than a calculated total ammonia nitrogen concentration of 155 mg/L; installation of a multiport diffuser within one year after issuance of a revised NPDES Permit; after installation of the diffuser, demonstrate compliance with the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and ZID and monitor ammonia nitrogen in the Illinois River on a quarterly basis; continue to investigate alternatives to production methods and technologies that generate less ammonia discharge and where practicable substitute these for the current methods or technologies; perform any reasonable test of new technologically or economically reasonable production methods or materials applicable to the specialty chemicals manufacturing process which may reduce ammonia concentration in the discharge which the Agency specifically may request in writing; comply with environmental requirements; and submit annual reports to the Agency detailing the status of complying with these requirements. The Board set an expiration date of seven years for the relief.

While the Henry Plant proceeded to comply with the conditions imposed in the Board order, as will be described below, the Agency issued a Public Notice to Reissue NPDES Permit No. IL0001392 on December 27, 2006 and on February 9, 2007 issued a revised permit to Emerald which became effective May 1, 2007 with expiration on April 30, 2012. A copy of this NPDES Permit is included as Exhibit 2 to this Petition. The Agency completed an administrative modification to this NPDES Permit to approve the request by Emerald and

PolyOne to designate PolyOne as a co-permittee on April 27, 2010.[2] A copy of this modified NPDES Permit is included as Exhibit 3 to this Petition. A timely renewal of the modified NPDES Permit was submitted on November 1, 2011 which remains pending before the Agency.

EMERALD'S EFFORTS TO COMPLY WITH BOARD ORDER IN AS 02-5

Central to compliance with the terms and conditions of the Board's Order was the installation of the multi-port diffuser which was completed October 4, 2005, at a cost of over $1.3 million dollars. Installation occurred more than two years earlier than that required by the Board's Order which required installation within one year after issuance of a revised NPDES Permit, or February 9, 2008. On October 25, 2005, AquAeTer completed a dispersion study of the installed diffuser. Their report entitled "Diffuser Performance Evaluation" was submitted to the Agency on December 21, 2005 for approval. A copy of this AquAeTer report is included as Exhibit 4 to this Petition. The results showed that the ammonia discharge was fully mixed at the edge of the ZID with a dispersion of 47.9:1 (2% effluent) and a dispersion of 299.9:1 (0.3%) at the edge of the mixing zone. Accordingly, this evaluation showed that the acute total ammonia nitrogen as N water quality standard would be met within the ZID and that the chronic total ammonia nitrogen as N water quality standard would also be met within the total mixing zone. The Agency ultimately approved this work and granted a mixing zone and a ZID that was used as a basis for the reissuance of the NPDES Permit in 2007.

AquAeTer contacted the Agency in June of 2006 following approval of the dispersion study and negotiated an agreed-to monitoring program for Emerald's sampling of ammonia

[2]Based upon discussions with the Agency concerning this petition it was determined that PolyOne should be included as a named recipient of any relief granted by the Board so as to allow the Agency to reissue the Henry Plant NPDES Permit with such relief given that PolyOne has been listed as a co-permittee so that the Agency can reissue the current NPDES Permit with any relief ultimately granted. PolyOne has agreed to this and if necessary become a Party to this proceeding.

concentrations in the Illinois River as required by the Board Order in AS 02-5. This ammonia monitoring program was set forth in the AquAeTer letter of June 20, 2006. Following the issuance of the renewed NPDES Permit in February 2007, AquAeTer prepared a monitoring plan entitled "Quarterly Mixing Zone Sampling Guidance Manual To Meet NPDES Permit No. IL0001392 Special Condition 18" dated April 2007. This guidance document has been used by Emerald to monitor the Illinois River ammonia nitrogen levels on a quarterly basis to demonstrate that its discharge does not result in an exceedance of the water quality standard. A copy of the AquAeTer ammonia monitoring letter, the guidance document together with a summary of the results of this monitoring is included as Exhibit 5 to this Petition. As shown in Exhibit 5, the monitoring results have ranged from less than 0.10 milligrams per liter ("mg/L") to a high of 0.27 mg/l ammonia nitrogen with each individual sample result showing compliance.

Annual reports providing the results of the ammonia nitrogen monitoring have been prepared and submitted to the Agency by Emerald as required. In addition to providing the quarterly ammonia monitoring results for the Illinois River, these annual reports also provide a description of Emerald's work on projects that have the potential to reduce ammonia levels in the waste water discharge as well as other environmental activities. These annual reports are included as Exhibit 6 to this Petition. To date, Emerald has not had any response from the Agency to these annual reports and therefore has had nothing suggested by the Agency to review or test as required by the Order.

While Emerald has operated the wastewater treatment system in substantial compliance with the requirements of its NPDES Permit there have been permit exceedances from time to time that have been reported to the Agency and set forth in Emerald's Discharge Monitoring Reports ("DMRs"). Since the NPDES Permit was issued in 2007 there have been three instances

where the Agency issued Violation Notices. The first, W-2008-00092, was issued on February 29, 2008 regarding Total Suspended Solid ("TSS") effluent exceedances in October and December of 2007 and Biological Oxygen Demand ("BOD") and TSS effluent exceedances in January 2008. Following a meeting with the Agency, Emerald provided the Agency with a thorough response describing the problem that caused exceedances and their efforts, including the results of the various studies conducted by their consulting firm, that were undertaken to resolve the problem. On June 12, 2008 the Agency accepted a Compliance Commitment Agreement ("CCA"). A copy of the correspondence concerning this Violation Notice is included as Exhibit 7 to this Petition.

On November 20, 2008 the Agency issued W-2008-00364 regarding Methylene Chloride effluent limit exceedances. Following a meeting with the Agency, a timely response was submitted explaining that the May exceedance was the result of only one sample being taken which was above the monthly average concentration and efforts taken by Emerald to preclude a repeat of what had caused the process upset that resulted in a discharge of process water that caused the July exceedance. On March 10, 2009 the Agency approved a CCA. A copy of the correspondence concerning this Violation Notice is included as Exhibit 8 to this Petition.

On March 31, 2011 the Agency issued W-2011-30116 regarding TSS effluent exceedances in November and December of 2010 and January of 2011. Emerald submitted a response describing the problems with the solids removal processes and the steps it had taken which resulted in compliance. On June 20, 2011 the Agency accepted a CCA. A copy of the correspondence concerning this Violation Notice is included as Exhibit 9 to this Petition.

Emerald has prepared a summary of the monitoring results that it has reported to the Agency in its monthly DMRs for ammonia nitrogen as N, biological oxygen demand ("BOD"),

total suspended solids ("TSS"), flow, pH and temperature which is included as Exhibit 10 to this Petition for the time period of January 1, 2001 through January 31, 2012. This data shows that with the exception of a three-day period in August of 2011 when the concentration was reported to be 180 mg/L ammonia and a three-day period from August 30 to September 1, 2011 with concentrations of 170, 170 and 160 mg/L ammonia all other discharges have been in compliance with the 155 mg/L total ammonia nitrogen limit contained in the Board Order. Even with these higher concentration numbers, the NPDES permit daily maximum ammonia load limit of 1,848.6 pounds per day was not exceeded.

Based upon this record, Emerald has substantially complied with all of the terms the Board imposed in AS 02-5 as a condition to the grant of the relief. In addition, Emerald has conducted effluent toxicity testing and submitted the results to the Agency quarterly as required by their NPDES Permit. At the edge of the ZID, which was set at 20 feet downstream from the diffuser discharge in the approved mixing zone study, a dispersion of 39.8:1 was achieved which gives a LC_{50} of 2.51 percent by volume. Because all of the acute toxicity testing results to date have been the above this value, Emerald is meeting their toxicity limit for LC_{50} of greater than or equal to 2.51 percent by volume.

35 ILL. ADM. CODE 104.406 INFORMATIONAL REQUIREMENTS

Because the Board has previously determined that adjusted standard relief from Section 304.122(b) is appropriate for the Henry Plant discharge and because Emerald has shown that it has complied with the terms and conditions imposed by the Board in granting such relief, Emerald will rely upon portions from the petition filed in AS 02-5 to fulfill select informational requirements. Emerald will update each section, as appropriate, with the general caveat that

conditions have remained the same except as will be clearly stated. A citation to the record in AS 02-5 were the documents can be found is also included, as appropriate.

35 ILL. ADM. CODE 104.406 INFORMATIONAL REQUIREMENTS

I. Standard From Which Relief Is Sought – Section 104.406(a)

Emerald is seeking an adjusted standard from the total ammonia nitrogen as N effluent limit in 35 Ill. Adm. Code 304.122(b) which was adopted at 26 Ill. Reg. 16948, effective November 8, 2002 which states as follows:

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

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.

A. Total Ammonia Nitrogen as N Effluent Limitations

On January 6, 1972, the Board adopted Rule 406 of its water pollution rules, which limited the ammonia nitrogen level of certain dischargers to the Illinois River. That rule has since been amended and is now codified at 35 Ill. Adm. Code 304.122. The rule as promulgated was specifically intended to reduce the discharge of ammonia nitrogen to the Illinois River from large dischargers because at the time of adoption it was believed that those dischargers were impacting dissolved oxygen at some locations in the river.

B. Total Ammonia Nitrogen as N Water Quality Standards

In the Matter of: Triennial Water Quality Review Amendments, R94-1(B) (Dec. 19, 1996) (Final Order) the Board adopted revised total ammonia nitrogen as N water quality standards which consisted of four separate un-ionized total ammonia nitrogen as N standards: an acute summer standard, a chronic summer standard, an acute winter standard and a chronic

winter standard. 35 Ill. Adm. Code 302.212. The Board amended the ammonia water quality standards to change the acute and general use water quality standards for un-ionized total ammonia nitrogen as N at 26 Ill. Reg. 16931, effective November 8, 2002.

Emerald does not seek an adjusted standard from these ammonia water quality standards, because the effluent from the Henry Plant continues to meet these revised water quality standards through use of a ZID and a mixing zone which were approved by the Agency subsequent to the Board decision in AS 02-5.

C. Mixing Zone and ZID

The installation of the required high rate multi-port diffuser was completed on October 4, 2005. AquAeTer immediately performed a diffuser study and prepared a report and submitted it to the Agency on December 27, 2005. This report is included as Exhibit 4 to this Petition. The results showed that the ammonia discharge was fully mixed at the edge of the ZID with a dispersion of 47.9:1 (2% effluent) and a dispersion of 299.9:1 (0.3%) at the edge of the mixing zone; see Exhibit 4 to this Petition. The Agency approved this dispersion report as evidenced by its issuance of the renewed Emerald NPDES Permit in February 2007 that required compliance with the water quality standards at the edge of the mixing zone following discharge through the diffuser.

II. Specified Level of Justification – Section 104.406(c)

The regulation of general applicability from which Emerald seeks an adjusted standard does not specify a level of justification. Thus, the Board can grant the adjusted standard upon adequate evidence of the four criterion set forth in Section 28.1(c) of the Act, along with the information required by 35 Ill. Adm. Code 104.406. The four criteria required by Section

28.1(c) of the Act, and which were fully presented in the record in AS 02-5, and were relied upon by the Board when it granted relief in AS 02-5, are discussed later in this petition.

III. Facility and Process Description -- Section 104.406(d)

A. Facility and Process Description

The Henry Plant is located on 1550 County Road 1450 in Henry, Illinois in northwestern Marshall County. The facility was solely owned and operated by the B.F. Goodrich Company from its initial construction in 1958 until 1993. In 1993, the B.F. Goodrich Company divested the Geon Vinyl Division from the company and formed The Geon Company ("Geon"), a separate, publicly held company. Geon owned and operated the polyvinyl chloride ("PVC") resin portion of the B.F. Goodrich Henry chemical plant until it consolidated with the M.A. Hanna Company on August 31, 2000 forming PolyOne which continues to own and operate the PVC resin production plant. In February 2001 the B. F. Goodrich Company sold all the assets of its chemical business, including the Henry Plant, to Noveon which in June of 2004 completed the December 23, 2003 sale of a portion of its specialty chemical operations, including the Henry Plant, to The Lubrizol Company ("Lubrizol"). Emerald has owned and operated the Henry Plant since Lubrizol sold the plant to a new owner on May 1, 2006.

Today, both PolyOne and Emerald continue to operate facilities at the Henry site in basically the same manner as was presented in AS 02-5. The wastewater treatment system is owned and operated by Emerald, and the system continues to treat the wastewater from both PolyOne's and Emerald's Henry Plant processes pursuant to a service agreement. The Agency has modified the NPDES Permit to list PolyOne as a co-permittee. Approximately 380,000 gallons per day of effluent from the PolyOne operations are treated by the Henry Plant wastewater treatment system, the Emerald operations contribute approximately 150,000 gallons

per day (gpd). An additional 270,000 gpd treated by the Henry Plan is combined PolyOne and Emerald utility waters and potential contact stormwater. The total daily discharge of process water and non-process water from the Henry Plant's wastewater treatment system is approximately 800,000 gallons. Emerald currently employs approximately 60 people and the PolyOne facility employs approximately 100 people at their sites.

Emerald produces two broad families of products: accelerators which are used in the rubber industry and anti-oxidants. The accelerators are used in tires and other rubber goods to "accelerate" the curing process. The antioxidants are used to inhibit the oxidation process in materials such as rubber, jet fuel, greases, oils and polypropylene. The vast majority of the Henry Plant production has historically been accelerators which are expected to account for 75% of the facility's output in 2012. Almost all of the accelerator production at Henry utilizes mercaptobenzothiazole ("MBT") as the key intermediate (73% of total plant production). MBT-based accelerators have been used in the rubber industry for well over 50 years and are the most common type of accelerator. MBT-based accelerators, which are relatively inexpensive and very efficient, are essential to the economic production of tires and industrial rubber products. Given the low cost and high value MBT-based accelerators provide customers, it is highly unlikely they will be replaced in the foreseeable future. Emerald is the sole remaining manufacturer of MBT in the United States.[3] As such, the Henry plant is now one of only two producers of MBT-based accelerators in the U.S. Lanxess is the other producer they import MBT from their facility in Antwerp (Belgium) and produce accelerators at their Bushy Park, SC plant. The Emerald Henry plant is the sole U.S. producer of the following accelerator chemicals:. Curite 18, OBTS, and

[3]The last two other MBT producers in the U.S shut down their facilities in the last decade. Flexsys exited its Nitro, WV plant in 2004 and Chemtura shut down its Geismar, LA accelerator unit and MBT production in 2006 (1).

MBDS. Along with MBT, these accelerators are used by Emerald's customers as a critical component when they produce rubber which is a national strategic product.

In the production of accelerators there are several key raw materials: sulfur, aniline, carbon disulfide and amines. The manufacture of accelerators is a multi-step process including the manufacture of an intermediate (sodium mercaptobenzothiazole). This intermediate is then reacted with an amine and other raw materials to form an accelerator product. The product is then isolated through filtration and drying.

There are various types of antioxidants manufactured by Emerald at the Henry Plant which utilize either diphenylamine or one of several phenols as a starting material. The processes consist of both batch and continuous reactors, filtration operations and solidification. Emerald has continued to produce most of the same products that were produced by Noveon and which were described to the Board when it granted the AS 02-5 relief. There are a few exceptions. Emerald no longer produces X70 and GELTOL which contributed only a small portion of the total Noveon production. In addition they currently produce much less of the products OBTS and C-18 in response to market conditions. Emerald does not produce any of the health care or personal care products that Noveon started to produce immediately prior to the sale. Emerald completed the installation and began operation of the sodium hydrosulfide (NaSH) system in 2006. The NaSH system does not produce any appreciable process wastewater and what is produced has no ammonia or ammonia precursors.

PolyOne produces polyvinyl chloride ("PVC") resins. These resins are sold to a variety of customers including those in the construction, household furnishings, consumer goods, electrical, packaging and transportation industries. PolyOne's process wastewater is combined

with the Emerald wastewater and treated in the Henry Plant's wastewater treatment system by Emerald.

Ammonia is not a major raw material in any of the processes at either PolyOne or the Henry Plant. As an ingredient in the Henry Plant production processes, ammonia is only used in minor amounts in one low volume product. PolyOne uses a small amount of ammonia as an ingredient to produce an emulsifier for use in one of the PVC processes. Because ammonia is not a primary ingredient in any of the processes carried out by either Emerald or PolyOne nor in the products either company produces, the source of the ammonia nitrogen in the effluent is not directly related to the level of ammonia in the raw waste water discharged to the treatment plant. As was previously determined, the amines in the wastewater are converted to ammonia nitrogen in the wastewater treatment process and, because nitrification does not occur as the result of inhibition, the ammonia nitrogen is subsequently discharged from the wastewater treatment plant. The efforts of Emerald to address the levels of the ammonia in the discharge are discussed later in this petition.

B. The Henry Plant Wastewater Treatment System

The wastewater treatment system at the Henry Plant is a multi-process system that treats both process wastewater and non-process discharges including potential contact stormwater and non-contact cooling water. A block flow diagram of the process is included as Exhibit 11 to this Petition. The Henry wastewater treatment system has historically provided greater than 95% biological oxygen ("BOD") reduction while discharging ammonia nitrogen in the range of 23 milligrams per liter ("mg/L") to 150 mg/L with the exception of two three day periods of upsets; see Exhibit 10 to this Petition.

All process wastewater is collected in equalization tanks prior to transfer to the primary treatment system. Wastewater from the Henry Plant's production of accelerators and antioxidants discharge to either the polymer chemicals ("PC") equalization tank or to the Cure-Rite 18® equalization tank. Waste activated sludge and solids from the PolyOne 213 wastewater pretreatment system that are not captured by the solids filter press discharge to the PVC equalization tank. From time to time depending on plant conditions, the PVC equalization tank may also receive recycle streams from various wastewater treatment processes such as the overflow from the filter press feed tank in the press building, backwash from the traveling bridge sand filters and returning pond water. Site-wide potential contact stormwater runoff and wastewaters from the boilerhouse and water treatment facility discharge to two holding ponds. In the primary treatment system, wastewaters are mixed, pH is adjusted, coagulant and flocculent are added, then wastewater is sent to the primary clarifier where suspended solids are separated. The solids are dewatered and sent to a landfill as a non-hazardous special waste.

After primary clarification, the wastewater is sent to activated sludge treatment consisting of up to four "biotreators." The biotreators are tanks that range in size from 320,000 gallons to 1.0 million gallons and contain biomass to degrade the organic matter in the wastewater. The addition of air into the biotreators ensures that the biomass has sufficient oxygen to complete the degradation of organic materials and also ensures through agitation that the biomass comes into adequate contact with the organic matter contained in the wastewater.

After biological treatment in the biotreators, the wastewater flows into the secondary clarifier where more coagulant and flocculant are added. The solids removed during secondary clarification are primarily biomass and are returned to the biotreators.

The wastewater from the secondary clarifier is then sent to a traveling bridge sand filter. As the wastewater passes through the sand bed, additional solids removal occurs and the effluent flows into a concrete sump leading to the outfall. Backwash from the sand filter is recycled back into the primary treatment system.

Non-process wastewater, including non-contact cooling water, potential contact stormwater, water from the boilerhouse demineralizer and water treatment works, is discharged to two holding ponds. The non-process wastewater is then pumped into the primary treatment system.

The City of Henry operates a municipal wastewater treatment system adjacent to the Henry Plant. The City of Henry municipal treatment system consists of an aerated lagoon followed by a sedimentation basin and effluent disinfection. The treated discharge from the City of Henry municipal wastewater treatment system combines with the treated Henry Plant effluent and is discharged together through the Henry Plant's outfall into the Illinois River. Compliance sampling of the Henry Plant and City of Henry waste streams is performed before the waste streams are combined.

C. Description of Area Affected

Following treatment, the wastewater is discharged through the high rate multi-port diffuser on Outfall 001 to the Illinois River pursuant to NPDES Permit No. IL0001392. The Illinois River is formed at the junction of the Kankakee and Des Plaines Rivers near Joliet, Illinois and runs 273 miles west, southeast and south to the Mississippi River, near Grafton, Illinois, which is a few miles upstream from St. Louis. The Henry Plant is located on the right edge of the water (when looking downstream) between river mile 198 and 199.

The Illinois River at Henry is approximately 875 feet wide, with an approximate 18 foot maximum depth. The average depth of the river is 11 feet, and it has a drainage area of approximately 13,543 square miles at Henry, IL. The USGS has operated a gauging station at Henry, Illinois since October 1981. The available USGS data for this gage indicate that the Illinois River at this location has an annual mean flow of 15,340 cubic feet per second ("cfs"). The Illinois State Water Survey reports an annual 7-day, 10-year low flow for the river at Henry of 3,400 cfs.

D. Description of Discharge

The effluent from the Henry Plant was originally discharged through an 18-inch, single-port submerged diffuser into the main channel of the Illinois River. Because the Henry Plant sits 40 to 50 feet above the Illinois River, the effluent enters the river with great velocity. A high-rate multi-port diffuser was installed in October of 2005 to replace the original single-port diffuser. The wastewater treatment plant now discharges through this high rate multi-port diffuser and has been determined to completely mix within an approved ZID and mixing zone. Based on an analysis of the Henry Plant discharge using the most recent available data from the Illinois River, AquAeTer has calculated the dispersion required to meet the acute standard is 11.5:1 and to meet the chronic standard is 68.1:1; see Exhibit 12. Their previous work showed that the multi-port diffuser achieves a dispersion of 39.7:1 in the zone of initial dilution and a dispersion of 239.2:1 at a distance of 553 feet. Since January 1, 2007 and through January 31, 2012, the effluent from the Henry Plant has had an ammonia concentration ranging from 23 to 150 mg/L with the exception of two three-day periods were the concentration exceeded 155 and reached as high as 180 mg/L of ammonia; see Exhibit 10. Based on an analysis of the Henry Plant discharge using the most recent available data from the Illinois River, AquAeTer has

determined that these discharges of total ammonia nitrogen as N can be discharged from the multi-port diffuser during summer and winter conditions, respectively, and still achieve the applicable acute and chronic total ammonia nitrogen as N water quality standards.

Over the years Emerald and its corporate predecessors expended significant resources at the Henry Plant in evaluating its production processes and wastewater treatment system in an effort to reduce the ammonia nitrogen levels in its wastewater treatment plant discharge. These efforts to evaluate various compliance alternatives are discussed in the next section of this petition.

IV. Cost of Compliance and Compliance Alternatives -- Section 104.406(e)

As detailed below, a variety of methods to reduce the level of ammonia nitrogen in its the wastewater treatment plant effluent were examined first by Noveon and its environmental consultant, Brown and Caldwell, f/k/a Eckenfelder Inc. and presented in AS 02-5, and then by Emerald, with continued assistance from Brown and Caldwell. In AS 02-5, Brown and Caldwell determination that there were no economically feasible treatment alternatives that would reliably reduce the effluent ammonia nitrogen concentrations low enough to comply with applicable requirements and their subsequent testimony in support of the requested relief was in large part accepted and cited by the Board as the basis for the relief it granted. Emerald has continued to work with Brown and Caldwell who remain very familiar with the Henry Plant and the wastewater treatment operations. Emerald hired Brown and Caldwell to revisit the previous work and see what (if any) changes have occurred since that presented in AS 02-5 that might alter their previous conclusions. The results of this new work by Brown and Caldwell are presented in a letter dated August 27, 2012 to Mr. Roy M. Harsch from Mr. Flippin. A copy of this letter and its attachments is included as Exhibit 13 to this Petition.

The following is a summary of the information presented in AS 02-5. In the late 1980's the Henry Plant evaluated the existing treatment system's ability to nitrify, or oxidize, ammonia to nitrates through single-stage biological nitrification. This early study concluded that single-stage biological nitrification was not achievable in the existing activated sludge system. The Agency requested a more extensive study of single-stage nitrification as a means to reduce ammonia. The requested additional treatability study was completed in December 1995, and a report was prepared and submitted to the Agency. The results of the treatability study conclusively demonstrated that the Henry Plant could not achieve single-stage nitrification under existing waste loads and optimum conditions of pH, dissolved oxygen ("DO"), temperature, alkalinity, food to microorganism ratio and mean cell residency time. The study also showed that the addition of a commercially provided "nitrifier-rich" biomass to the wastewater treatment plant would not prompt the initiation of nitrification due to the waste load characteristics and not the operating conditions. The inability of the Henry Plant wastewater treatment system to nitrify was due to inhibition of nitrifying bacteria by the fundamental constituents in the wastewater.

After it was determined that the Henry Plant wastewater treatment system could not nitrify, various other technologies for the control and/or reduction of ammonia nitrogen in its discharge were investigated. This investigation involved three technology based nitrogen ammonia reduction measures: 1) in-process reductions; 2) pretreatment of the wastewater; and 3) post-treatment of the wastewater. The options explored in each of these three categories are discussed below.

A. In-Process Reductions

Previously, Noveon explored whether the Henry Plant could eliminate the use of amines in the various processes or whether it could recover and/or recycle the precursors to ammonia for

reuse in the system. Both of these methods were rejected as feasible compliance alternatives following analysis by a research and development team from Noveon. Amines continue to be an essential element in many of the products produced at the Henry Plant, and elimination of amines would essentially require the complete elimination of the affected product lines, if not closing the entire plant. The recycling option was also rejected on the basis that the recycled material was of inferior quality and would not guarantee production of the high quality product that customers demand. In addition, the waste material generated in the recycling process would likely be classified as a hazardous waste, which raised concerns about cross-media impact associated with this alternative. Excess amines are, however, currently recovered from processes where recovery methods provide usable quality materials and are not cost prohibitive.

B. Pretreatment

The second option, additional pretreatment of the wastewater, involved the removal of certain constituents before the water was sent to the wastewater treatment system. The Henry Plant has investigated a variety of pretreatment options, including morpholine recovery, tert-butyl alcohol recovery and a liquid extraction process in which a solvent is passed counter-current to the wastewater removing the amines from the water. None of the pretreatment options would achieve reduction that would result in compliance with the ammonia nitrogen effluent standard of 35 Ill. Adm. Code 304.122(b). The pretreatment options also raised various technical issues including plant personnel safety issues.

C. Post-treatment

Once it was concluded that the Henry Plant could not achieve compliance through single-stage nitrification, in process reductions or pretreatment options, Brown and Caldwell was retained to develop preliminary process designs and cost estimates to evaluate other post-

treatment alternatives that could reduce the ammonia nitrogen in the effluent from the Henry Plant. Brown and Caldwell prepared a report in 2004 which contained their evaluation of the following six alternatives:

1. Alkaline air stripping at different points in the wastewater treatment system (e.g., PC tank, PVC tank and secondary clarifier).

2. Struvite precipitation from the combined wastewater influent.

3. Effluent breakpoint chlorination.

4. Single-stage biological nitrification of non-PC wastewater combined with separate biological treatment of the PC tank discharge.

5. Biological nitrification of combined influent wastewater.

6. Ion exchange treatment of final effluent.

Brown and Caldwell testified regarding these six alternatives and their subsequent evaluation of ozonation and tertiary nitrification as additional potential compliance alternatives

1. Alkaline Air Stripping

Ammonia nitrogen exists in two forms, aqueous and gaseous, and as pH increases the aqueous form becomes a gas. Thus, by increasing the pH of a wastewater stream it is possible to strip or remove the ammonia gas. This alternative as investigated involved the use of air stripping at three separate portions of the treatment system: 1) within the PC tank; 2) within the PVC tank and 3) after the secondary clarifier discharge; see Exhibit 13, pages 2-1 to 2-2.

Because samples of the PC tank and PVC tank discharges contained greater than 500 mg/L TSS, a packed tower air stripper or horizontal tray stripper would require frequent maintenance due to fouling. Thus, diffused air stripping and surface aeration processes were both selected for evaluation in both the PC tank and PVC tank. Due to the slow rate of these stripping processes, the small amount of ammonia available in these tanks, and the large flow

rates of the wastewater into the PC tank and PVC tank, only stripping within the existing tanks was considered. Building additional tanks and aeration equipment to address ammonia removal from the wastewater would have offered little additional benefit because the bulk of the ammonia nitrogen discharged from the Henry Plant is generated in the downstream wastewater treatment facility. Conventional packed tower air stripping of the wastewater treatment facility effluent downstream of the secondary clarifier wastewater was selected for evaluation because this is a well-established stripping technology.

The batch air stripping test results from 1996 for the PC tank, PVC tank and secondary clarifier wastewater indicated that some ammonia reduction in those wastewaters could be achieved. A combined removal of ammonia nitrogen from the wastewater, however, of less than 20% would be achieved by treatment of either the PC tank or PVC tank wastewater using surface aeration stripping technology. This low level of ammonia reduction means air stripping from the PC tank and PVC tank would not achieve sufficient ammonia nitrogen reduction allow the Henry Plant to meet the effluent limitation of 35 Ill. Adm. Code 304.122(b). Further, given the present worth costs (capital, operation and maintenance costs) in 2004 of $2.3 million for PC tank treatment and $14.1 million for PVC tank treatment, this alternative was also deemed economically unreasonable in light of the high costs and low ammonia reduction obtained.

The ammonia nitrogen removal achieved from the secondary clarifier was greater than 95% using packed tower air stripping technology. One difficulty with this alternative is that it would increase total dissolved solids ("TDS") by more than 20%, which could lead to aquatic toxicity of the effluent. The most important difficulty with this treatment alternative is its high operation, maintenance and installation costs, which makes it economically unreasonable with a

present worth costs of $14 million in 2004. The costs associated with this alternative are high because additional equipment is required to remove the ammonia from the off-gas emissions.

2. Struvite Precipitation

This alternative involved an analysis of the ammonia reduction achieved by the precipitation of struvite ($NH_4MgPO_4.6H_2O$) from the combined Henry Plant and PolyOne wastewater. The results of the batch treatability studies indicate that under certain operating conditions the combined wastewater ammonia concentration can be reduced to approximately 25 mg/L in the treatment plant influent. This treatment process, however, would provide only a 24% reduction in the average final effluent ammonia level at a present worth cost of $5.1 million in 2004. This alternative also would increase TDS in the Henry Plant effluent.

In sum, struvite precipitation would not result in compliance with the ammonia effluent limit. Because only a small portion of the wastewater nitrogen load would be removed from the Henry Plant treatment system by struvite precipitation, and the high cost of implementing this solution, it was determined to not be a feasible compliance alternative.

3. Effluent Breakpoint Chlorination

Brown and Caldwell also evaluated the use of chlorine to achieve ammonia reduction. This alternative involved gravity discharge of the secondary clarifier wastewater to a reaction tank where chlorine gas would be sparged into the tank and caustic soda added to maintain a pH of approximately 6.9. Following the addition of chlorine, the wastewater would be discharged to the existing sand filters.

This alternative could meet the ammonia nitrogen as N standard set forth in 35 Ill. Adm. Code 304.122(b). This treatment option is prohibitively expensive, at a present worth cost of $9.7 million in 2004. Thus, this alternative is economically unreasonable. This alternative will

also dramatically increase effluent TDS and may result in the formation of chlorinated organics in the effluent.

4. Single-stage Biological Nitrification of Non-PC Wastewater

Brown and Caldwell also examined what level of ammonia reduction would occur by first-stage nitrification of the non-PC wastewater followed by second-stage biological treatment of the PC tank wastewater after combination with effluent from the first-stage reactor. Based on the results of the batch treatability study, it was determined that this was not a feasible compliance alternative because of the low level of ammonia reduction achieved. The percent ammonia reduction was only 47% and yet had a present worth cost of $4.9 million in 2004.

5. Biological Nitrification of Combined Wastewater

This alternative required pH reduction of the PC tank discharge, followed by river water addition and combined single-stage nitrification with non-PC wastewater. The results of the analysis by Brown and Caldwell showed that biological nitrification of the combined wastewater stream was a technically feasible compliance alternative. This alternative suffers from a lack of reliability, which is necessary for consistent compliance, because it is sensitive to the variable characteristics inherent in the wastewater produced by the different batch processes at the Henry Plant.

Further, biological nitrification is a very costly alternative. Brown and Caldwell estimated that the present worth costs of this alternative was $11.7 million in 2004. These costs make this an economically unreasonable alternative, particularly in light of the associated reliability concerns.

6. Ion Exchange

One other compliance alternative analyzed by Brown and Caldwell was ion exchange treatment of the secondary clarifier effluent using clinoptilolite, an ammonia selective ion exchange resin. This alternative could meet the ammonia effluent standard of 35 Ill. Adm. Code 304.122(b). The batch treatability test results demonstrated that approximately 50 lbs. of clinoptilolite would be required to remove each pound of ammonia. This poor removal efficiency was presumed to be due to the large concentration of competing ions in the effluent.. The poor selectivity of this alternative for removing ammonia precluded further consideration of ion exchange as a compliance alternative. This alternative had a present worth cost of $5.1 million in 2004.

7. Ozonation

This alternative could meet the ammonia nitrogen as N standard set forth in 35 Ill. Adm. Code 304.122(b). It was rejected as an alternative due to its high present worth costs of $20.3 million in 2004. Further, this alternative would significantly increase the effluent TDS concentrations and would likely also convert some of the effluent non-degradable and chemical oxidation demand ("COD") into biological oxygen demand ("BOD"), which could cause BOD effluent limit violations.

8. Tertiary Nitrification

This alternative would involve pumping the secondary clarifier effluent through a separate aeration basin containing fixed film media where nitrifying bacteria would grow. Alkalinity and DO would be controlled in this basin to meet the demands associated with nitrification. Effluent from this tank would be directed to the existing tertiary filtration process that would be expanded to accommodate the additional solids loading. Results of analyses from

the late 1980s and confirmed during the 1990s indicate this process is a technically feasible compliance alternative. The difficulty with this alternative is that it lacks reliability, which is necessary to achieve compliance, due to its great sensitivity to variations in wastewater characteristics that occur with the Henry Plant's batch processes.

Brown and Caldwell estimated that the present worth costs of tertiary nitrification was $11.4 million in 2004. It was their conclusion as presented in AS 02-5 that those costs make this an economically unreasonable alternative, particularly in light of the associated reliability concerns.

As previously explained, Emerald retained Brown and Caldwell to review the conclusions presented in AS 02-5 and determine what, if any, changes have occurred since 2004. The results of the reevaluation work are set forth in Exhibit 13. Brown and Caldwell noted in their report that some changes were made to the Henry Plant production processes and the products produced but concluded that these changes did not appreciably alter the alternatives available for reduction of ammonia nitrogen as N in the Henry Plant effluent. The following changes made to the wastewater treatment system since 2002 were evaluated:

1. Implemented carbon dioxide (CO_2) addition plus 400 gallons per day (gpd) of 98 percent sulfuric acid in PC Tank versus prior use of acid only.

2. Synthetic flocculent addition only in primary treatment versus prior ferric chloride and anionic flocculent additions.

3. Synthetic flocculent and synthetic coagulant additions in secondary treatment versus prior alum and anionic flocculent additions.

4. Current operation of West and North biotreaters versus prior operation of East and Center biotreaters also (1.3 million gallons versus 1.9 million gallons of volume).

These changes appear to not have caused any appreciable change in effluent quality based on the average effluent BOD and COD concentrations (consistently at approximately 8 mg/L and 370 mg/L, respectively), from 2002 through 2011. Recent sampling indicates that the effluent ammonia nitrogen as N and Total Kjehldahl nitrogen ("TKN") continue to remain comparable (within 10 percent of each other) indicating near complete hydrolysis of organic nitrogen. The 2012 Brown and Caldwell report found that the wastewater treatment plant still operates at conditions that would prompt the biological nitrification (Mean Cell Residence Time greater than 30 days, mixed liquor temperatures of 80 to 96°F and DO concentrations of 1.5 to 4.5 mg/L, effluent alkalinity of greater than 150 mg/L, and effluent orthophosphate-phosphorus concentrations of greater than 0.5 mg/L), but the lack of nitrification continues to be due to bio-inhibition to nitrifying bacteria presumably caused by MBT.

Next Brown and Caldwell considered all of the alternatives that were previously evaluated and which are set forth above and in Exhibit 13. All but three of these alternatives were re-evaluated. Nitrification alternatives were not reconsidered due to their prior poor economic viability and the continued presence of significant nitrification inhibition, which made these treatment alternatives of questionable reliability. The alternatives which they re-evaluated are listed below using their previous numbering:

1. Alkaline air stripping of PC Tank contents with off-gas collection and treatment (prior Treatment Alternative No. 1 or No. 1).
2. Alkaline air stripping of PVC Tank contents (No. 2).
3. Alkaline air stripping of secondary clarifier effluent (No. 3).
4. Struvite ($NH_4MgPO_4 \cdot 6H_2O$) precipitation from combined influent (No. 4).
5. Breakpoint chlorination of secondary clarifier effluent (No. 5).
8. Ion exchange treatment of final effluent (No. 8).
9. Ozonation of final effluent (No. 9)

Brown and Caldwell also update the cost estimates developed and presented in AS 02-5 using scaling by a series of factors to produce equivalent costs for 2011. The capital costs, annual operating and maintenance costs and present worth costs are presented in Tables 4, 5 and 6 in Exhibit 13 and illustrated below as total annualized costs as directed in Worksheet G of the Interim Economic Guidance for Water Quality Standards, USEPA Office of Water, EPA-823-B-95-002, March 1995 with the inclusion of inflation adjusted annual operation and maintenance (O/M) costs.

Comparison of Ammonia Removal and Treatment Annual

Compliance Alternative No.

	1	2	3	4	5	8	9
NH_3-N Removal, lbs/day	7	212	449	88	464	464	464
NH_3-N Removal, %	2	45	95	19	98	98	98

Total Annual Costs.

Capital [a]	177	52	1131	36	171	196	1248
O/M [b]	403	4176	2227	1643	1940	924	1948
Total	580	4228	3357	1678	2111	1121	3196
Total, $/lb NH_3-N removed	227	55	20	52	12	6.6	19

[a] Based on a 10-year period, 3.5 percent annual interest and no salvage value.

[b] Based on 10 year period and 3.0 percent inflation rate.

In summary, the minimum present worth cost for a 98 percent reduction in effluent ammonia nitrogen was $1.12 million per year at $6.6/lb. of ammonia nitrogen removed (alternative No. 8). If a 25 percent reduction were provided under alternative No. 8, the present worth costs would be $343,000 per year at a cost of $8.1/lb. of ammonia nitrogen removed as described in Attachment C of Exhibit 13.

Brown and Caldwell also evaluated new treatment technologies demonstrated since 2004 which could provide effluent ammonia nitrogen reduction at the Henry Plant. They concluded

that none of these technologies are as economically viable as the ones discussed above. The new technologies evaluated and discussed in Exhibit 14 are:

CASTion Ammonia Recovery Process (ARP)

Ostara Pearl

Liqui-Cel Membrane

Anammox

Anodic Oxidation

In sum, Emerald and the previous owners of the Henry Plant and their consultants Brown and Caldwell have evaluated a number of in-process reductions, pretreatment measures and post-treatment measures as methods to achieve compliance with the ammonia nitrogen effluent limit of 35 Ill. Adm. Code 304.122. The results of the evaluation demonstrate that, as was found by the Board in AS 02-5, there is no alternative that is both technically feasible and economically reasonable that would allow the Henry Plant to achieve compliance with the ammonia effluent limit of 35 Ill. Adm. Code 304.122(b).

V. Proposed Adjusted Standard -- Section 104.406(f)

Proposed Adjusted Standard -- Section 104.406(f)

Emerald proposes the adoption by the Board of the following adjusted standard language:

> Emerald Performance Materials LLC ("Emerald") and PolyOne, Corporation ("PolyOne") are 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 Emerald plant located at 1550 County Road 1450 in Henry, Illinois as regards ammonia nitrogen. The granting of this adjusted standard is contingent upon the following conditions:
>
> A. Emerald shall not discharge at concentrations greater than calculated ammonia nitrogen as N 155 mg/L from its Henry, Illinois plant into the Illinois River.

B. Discharge into the Illinois River shall occur through the existing high rate multi-port diffuser.

VI. Environmental Impact -- Section 104.406(g)

The granting of the adjusted standard will not result in any adverse environmental impact. As noted earlier, the Board's rationale at the time 35 Ill. Adm. Code 304.122 was adopted was premised upon the belief that larger dischargers were contributing to low DO levels (sags) in the Illinois River. The study underlying that belief was later refuted by its authors when it was discovered that the DO sags were occurring not as a result of larger dischargers but primarily because of sediment oxygen demand. The discharge from the Henry Plant will not have a measurable effect on the DO in the Illinois River.

Further, the quarterly stream ammonia nitrogen monitoring of the Illinois River that has been conducted since 2007 demonstrates that the both the acute and chronic ammonia nitrogen water quality standards are routinely met at edge of the approved ZID and mixing zones as required.

Thus no adverse environmental impact, including harm to aquatic life, will result from the granting of the requested adjusted standard.

VII. Justification for Adjusted Standard – 104.406(h)

As noted previously, the regulation of general applicability from which Emerald seeks an adjusted standard is sought does not specify a level of justification for such a standard. Section 28.1(c) of the Act, however, allows the Board to grant an adjusted standard in the absence of a specified level of justification if the Board determines based upon adequate proof by the petitioner that:

A. Factors relating to the petitioner are substantially different from the factors relied upon by the Board in adopting the general regulation;

B. The existence of those factors justifies an adjusted standard;

C. 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

D. The adjusted standard is consistent with federal law.

Each of these factors is discussed below.

1. Substantially Different Factors -- Section 28.1(c)(1)

The existing ammonia nitrogen as total N effluent regulation in 35 Ill. Adm. Code 304.122 is premised upon two factors: the ability to treat ammonia and the desire to address DO concerns in the Illinois River. Regarding the ability to treat ammonia, in amending the generally applicable rule the Board expressly noted that "present technology is capable of meeting this limit and should result in the removal of much ammonia nitrification oxygen demand from these stressed waterways." (In the Matter of Water Quality Standards Revisions, R72-4 (Nov. 8, 1973) (Final Opinion)). In general, there is technology capable of meeting the ammonia nitrogen as N limitation set forth in 35 Ill. Adm. Code 304.122. Specifically as applied to the Henry Plant wastewater, however, the numerous investigations and studies conducted by, and on behalf of, the Henry Plant have established 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).

Regarding the desire to address DO concerns in the Illinois River, the underlying technical justification that led the Board to adopt the general rule, i.e., a concern about DO sags being caused primarily by the discharge of ammonia nitrogen was refuted. The DO sags were later determined to be caused primarily by sediment oxygen demand. Ammonia nitrogen

discharged at the level requested by Emerald will thus have minimal, if any, impact upon the level of DO in the Illinois River; see Exhibit 2. Nor will it contribute to any water quality violations or harm to aquatic life as discussed in Section IV above. In sum, the factors relied upon by the Board in adopting what is now 35 Ill. Adm. Code 304.122 were substantially different than those applicable to the Henry Plant.

2. Adjusted Standard Justification -- Section 28.1(c)(2)

One factor that must be taken into consideration when adopting environmental regulations in the State of Illinois is economic reasonableness. The total ammonia nitrogen as N effluent limit from which relief is sought was adopted based upon balancing the potential adverse impact upon DO against the cost and ease of control. On both of these points, the data supports granting the requested adjusted standard relief. The beneficial impact, if any, to the Illinois River would be minimal if Emerald were required to meet the total ammonia nitrogen as N limitation of 35 Ill. Adm. 304.122(b). Further, given the lack of any discernible environmental benefit, the high cost of the technically feasible control technology makes it economically unreasonable for Emerald to meet this effluent limitation and warrants the requested adjusted standard relief.

3. Environmental or Health Impacts -- Section 28.1(c)(3)

There is no measurable impact upon the environment or human health that would result from the granting of this adjusted standard. As discussed in Section IV of this petition, the discharge from the Henry Plant will meet the winter and summer acute water quality standards for total ammonia nitrogen as N at the edge of an appropriately calculated ZID. The winter and summer acute and chronic standards will also be met at the edge of an appropriately calculated

mixing zone. Thus, the impact will not be significantly more adverse than that contemplated by the regulation of general applicability.

4. Consistency With Federal Law -- Section 28.1(c)(4)

The requested adjusted standard is consistent with federal law. The requested relief applies only to ammonia nitrogen as N discharges from the Henry Plant. There are no applicable federal numeric effluent standards or water quality standards for ammonia nitrogen as N. Under federal regulations a water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (the Act). "Serve the purposes of the Act" (as defined in sections 101(a)(2) and 303(c) of the Act) means that water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation. 40 C.F.R. 131.2.

Under 40 C.F.R. 131.4(a) "states are responsible for reviewing, establishing and revising water quality standards." In turn, pursuant to 40 C.F.R. 131.5(a), "EPA is to review and to approve or disapprove the State-adopted water quality standards." These standards are to be protective of the designated uses (§131.5(b)) and, where those uses are not protected, this must be supported by "appropriate technical and scientific data and analyses." (§131.5(b)(4)). A state is allowed to remove a designated use, which is not an existing use, if it "can demonstrate that attaining the designated use is not feasible" because of several enumerated causes (§131.10(g)).

The granting of this adjusted standard will not impair any beneficial use of the receiving stream in that the generally applicable state water quality standards (which were established at a level to protect aquatic life) will be met with an appropriately calculated zone of initial dilution and mixing zone so as to be fully supportive of all beneficial uses.

VIII. Waiver of Hearing -- Section 104.406(j)

Emerald requests a hearing in this matter.

IX. Supporting Documents -- Section 104.406(k)

Supporting documents cited in this petition are attached as Exhibits 1 through 14.

X. Petition Verification

The affidavit of Jarrod Kocin is attached as Exhibit 14 verifying the material facts set forth in this petition.

CONCLUSION

Emerald and the previous owners of the Henry Plant have explored a number of alternatives in order to comply with the ammonia nitrogen as N effluent limit of 35 Ill. Adm. Code 304.122(b). These efforts which occurred prior to and subsequent to the Board's Order granting adjusted standard relief in AS 02-5 have included evaluation of process changes, pretreatment alternatives, treatment alternatives and post-treatment alternatives. As the testimony and documentary evidence included in the Exhibits submitted in AS 02-5 which were part of the record upon which the Board previously granted AS 02-5 and the Exhibits attached to this petition show, and as will be confirmed by the witnesses for Emerald at hearing, none of the alternatives evaluated are both economically reasonable and technically feasible. Because the relief requested by Emerald will not result in any adverse environmental impact, or present any ill effects upon human health, the relief should therefore be granted.

WHEREFORE, Emerald respectfully requests that the Board grant Emerald and PolyOne an adjusted standard from 35 Ill. Adm. Code 304.122(b), subject to the conditions set forth herein, for the wastewater discharged from the Henry Plant as it did in AS 02-5.

Respectfully submitted,

Emerald Performance Materials LLC.

By: _____

One of Its Attorneys

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Exhibit List

1. Board's November 4, 2004 Opinion and Order in AS 02-5.

2. NPDES Permit No. IL0001392, effective May 1, 2007.

3. Modified NPDES Permit No. IL0001392 dated April 27, 2010.

4. AquAeTer Dispersion Report dated December 2005.

5. AquAeTer ammonia nitrogen as N monitoring program letter dated June 20, 2006, Quarterly Mixing Zone Sampling Guidance Manual To Meet NPDES Permit No. IL0001392 Special Condition 18 dated April 2007 and summary of monitoring results.

6. Emerald Annual Reports 2006-2011.

7. Violation Notice W-2008-00092 and Related Correspondence.

8. Violation Notice W-2008-00092 and Related Correspondence.

9. Violation Notice W-2011-30116 and Related Correspondence.

10. Summary of DMR data (January 1, 2001 through January 31, 2012).

11. Process Block Flow Diagram

12. AquAeTer Memo dated May 10, 2012.

13. Brown and Caldwell Report dated August 27, 2012.

14. Affidavit of Jarrod Kocin.

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