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STATE OF ILLINOIS
Pollution Control Board

ILLINOIS POLLUTION CONTROL BOARD
August 1, 2013

IN THE MATTER OF:)
)
PETITION OF EMERALD PERFORMANCE) AS 13-2
MATERIALS LLC FOR AN ADJUSTED) (Adjusted Standard)
STANDARD FROM 35 ILL. ADM. CODE)
304.122(b))



ORIGINAL

HEARING OFFICER ORDER

On September 28, 2012, Emerald Performance Materials LLC (Petitioner or Emerald) filed a petition for an adjusted standard from the total ammonia nitrogen as nitrogen (N) effluent standard at 35 Ill. Adm. Code 304.122(b) for the effluent from the wastewater treatment plant at Emerald's chemical manufacturing facility in Henry, Marshall County. A hearing officer order was issued in this case on December 17, 2012 with questions regarding the petition. The Illinois Environmental Protection Agency (Agency) filed its recommendation on January 14, 2013. The petitioner filed its Response to Hearing Officer Order on April 12, 2013.

Based on the Agency's recommendation and the petitioner's response to the hearing officer order questions, the petitioner and Agency are directed to respond to the additional questions provided in Attachment A on or before October 8, 2013, a week before the presently scheduled status conference on October 15, 2013.

IT IS SO ORDERED.

Carol Webb

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Hearing Officer
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CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing order were mailed, first class, on August 1, 2013, to each of the persons on the attached service list.

It is hereby certified that a true copy of the foregoing order was hand delivered to the following on August 1, 2013:

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AS 13-2
**In the Matter of: Petition of Emerald Performance Materials LLC
for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)**

Attachment A

Questions for Emerald and the Agency regarding
Agency Recommendation filed 1-14-13¹ and Response to
Hearing Officer Order (HOO) filed 4-12-13²

Questions for Emerald:

1. Toxicity Testing:

Emerald provided results of toxicity testing in Attachment 4 of the Response to HOO covering a round of sampling in 2006 and four sampling events from 2011 to 2012. Resp. to HOO at 15, Att. 4. The following is a summary of the results, along with a calculation by the Board's staff of the corresponding dilution ratios:

Date	LC50 (percent effluent)		NOEC (percent effluent)		Dilution Ratio (based on LC50 PP)
	Pimephales promelas (PP) (Fathead minnow)	Ceriodaphnia dubia (water flea)	Pimephales promelas	Ceriodaphnia dubia	
09/26- 29/06, 09/28- 29/06 10/1-2/06	16.0*	16.0**	2	8	6.25:1
6/13/11	8.50*	11.27**	6.25	6.25	11.8:1
7/25/11	8.68**	12.5**	6.25	6.25	11.5:1
10/12/11	22.75*	31.86**	6.25	12.5	4.4:1
1/23/12	<6.25**	9.42**	<6.25	6.25	>16.0:1

*: Based on 96-hour test

** : Based on 48-hour test

LC50: Median lethal concentration

NOEC: No Observed Effect Concentration

Dilution Ratio (based on LC50 PP): Parts background river water to parts effluent from Emerald/PolyOne

Resp. to HOO at 15, Table B, Att. 4.

¹ The Agency's Recommendation filed January 14, 2103 will be cited as "Ag. Rec. at ____."

² Emerald's Response to Hearing Officer Order filed April 12, 2013 will be cited as "Resp. to HOO at ____."

- (a) A note below Table B on page 15 of the Response to HOO states, "There was a problem with the sample collected on July 25, 2011 and the laboratory was only able to perform a 48-hour test on the *Pimephales promelas*." Resp. to HOO at 15. Would you please indicate if the same is true of the January 23, 2012 sample? Attachment 4 for the January 23, 2012 sample analysis states, "Note: Calculations were performed on the 48 hr *Pimepales promelas* data rather than 96 hr due to UPS failure to deliver the renewal effluent." Resp. to HOO, Att. 4.
- (b) Emerald's NPDES Permit Special Condition 14 required a biomonitoring testing frequency for four quarters beginning 18 months before the expiration date of the Permit. Pet. Exh. 3 at 7. Since the Agency appeared to note that the laboratory did not dilute the January 23, 2012 sample sufficiently to determine the LC50 value without a less-than "<" notation, would Emerald please submit into the record before hearing the results of a more recent Whole Effluent Toxicity (WET) testing that sufficiently dilutes the sample? Although the Agency has recommended this as a condition of the adjusted standard if granted (Ag. Rec. at 22, Condition B), please indicate Emerald's ability to provide the results before hearing.
- (c) The petition³ states that Emerald's effluent combines with the discharge from the City of Henry's municipal wastewater treatment plant and is discharged together through the Henry Plant's outfall and diffuser into the Illinois River, but compliance sampling is performed before the waste streams are combined. Pet. at 18. Special Condition 6 of the NPDES Permit (Pet. Ex. 3) states,

For the purpose of this permit, the discharge from outfall 001 is limited to the discharges from outfalls A01 and B01, free from other waste water dischargers. Sampling for the monitoring requirements for the discharge shall be taken at a point representative of the discharge and prior to entry into the receiving stream or mixture with the City of Henry POTW's effluent. Pet. Exh. 3 at 6.

Special Condition 14 of the NPDES permit requires "biomonitoring of the effluent from Discharge Number(s) 001." Pet. Exh. 2 at 7. Please clarify if the biomonitoring WET testing was performed on effluent from just the Henry Plant or the combined discharge with the City of Henry (Publicly-Owned Treatment Works (POTW)).

- (d) Table A of the Response to HOO has a section entitled, "Previous Ammonia Variance – Dispersion Required, Effluent = 155 mg/L from Emerald, 126 mg/L combined." Resp. to HOO at 13. According to the Diffuser Performance Evaluation, the 126 mg/L combined refers to the total ammonia concentration from both the Noveon Henry Plant (at 155 mg/L, 1 mgd) and the City of Henry POTW (at 30 mg/L, 0.3 mgd). Pet. Exh. 4 at 1-8. Please clarify if the

³ Emerald's Petition filed September 28, 2012 will be cited as "Pet. at ____."

“Dispersion Required” in Table A was calculated based on the combined effluent from Emerald/PolyOne (Henry Plant) and the City of Henry POTW. Please also clarify if the reference to “Previous Ammonia Variance” in Table A of the Response to HOO should be “Ammonia Adjusted Standard AS 13-2”.

- (e) Emerald states, “The dispersion achieved in the Zone of Initial Dilution (ZID) is 39.8:1. This means 1 part effluent to 38.8 parts background river water at the edge of the ZID.” Resp. to HOO at 15. Does Emerald mean, “39.8 parts background river water”? When Emerald refers to “1 part effluent”, does Emerald mean “1 part combined effluent from Emerald/PolyOne and City of Henry POTW”?
- (f) For the chronic standards, Emerald states, “As shown in Table A, above, the critical dispersion required is 101.2:1.” Resp. to HOO at 13. Does Emerald mean “121.2:1” as actually appears in Table A?
- (g) For each of the WET testing results, please provide the dilution ratios that correspond to the percent effluent from Emerald/PolyOne.
- (h) Please indicate whether the corresponding dilution ratios of the WET testing results are less than the dilution/dispersion ratio provided at the edge of the ZID (39.8:1 at 20 feet or 47.9:1 at 92 feet). Resp. to HOO at 15, Pet. Exh. 4 at vi, 3-14.
- (i) Please clarify whether the corresponding dilution ratios of the WET testing results are less than the “dispersion required” to meet the acute standard as calculated in Table A of 19.5:1 (or 19.2:1). Resp. to HOO at 13.
- (j) Please clarify whether the dispersion provided at the edge of the ZID (39.8:1 at 20 feet or 47.9:1 at 92 feet) is greater than the “dispersion required” as calculated in Table A.
- (k) Since it appears the “dispersion required” values in Table A were calculated based on the combined discharge (126 mg/L ammonia as N) but the LC50 results were based on Emerald/PolyOne’s effluent alone, please explain the practical effect of comparing the corresponding dilution ratios from the LC50 percent effluent results to the required dilution ratios in Table A (i.e. the “dispersion required” values). Would the river see effluent with the LC50 values reported for Emerald/PolyOne or rather would it likely see relatively higher LC50 values if the combined effluent underwent WET testing?

2. Agency Recommended Conditions:

If the Board were to grant the adjusted standard, the Agency recommended several conditions, from reducing ammonia in the effluent by 48% to investigating and annually

reporting on new methods and technologies. Ag. Rec. at 22-23. Please comment on each of the Agency's recommended conditions.

3. Potential Adjusted Standard Conditions:

Emerald stated, "Emerald has not had available capital to spend on additional projects that do not allow some return on investment or at least offset some operating expenses." Resp. to HOO at 9. From the perspective of incurring or avoiding potential future costs of complying with the adjusted standard conditions, please comment on the following conditions:

- (a) Please comment on including a condition in the adjusted standard that would sunset the requested relief in 7 years, coupled with conditions that would establish annually recurring requirements regarding investigations into new treatments and methods to continually demonstrate Emerald is providing "best degree of treatment" to be eligible for the dilution provision in 35 Ill. Adm. Code 304.102 along with the Agency recommended conditions D through I. *See* Rec. at 22-23.
- (b) Instead of a sunset provision, annually recurring requirements regarding investigations into new treatments and methods, and the Agency recommended conditions D through I; please comment on including conditions such as the following in the adjusted standard:
 - (1) until more stringent Illinois ammonia water quality standards are adopted, a condition that would impose the ammonia effluent limit requested by Emerald in its petition along with requirements to discharge through the diffuser and meet currently applicable water quality standards at the edge of the ZID and mixing zone; and
 - (2) if Emerald will continue to utilize the dilution provision under 35 Ill. Adm. Code 304.102, a condition to implement and maintain a nonpoint source best management practice (BMP) to provide an environmental benefit that also addresses ammonia (as noted below under "Best Degree of Treatment Determination").

4. Best Degree of Treatment Determination:

In AS 02-5, in order for Noveon to be eligible for a ZID and mixing zone and to utilize the dilution provision in 35 Ill. Adm. Code 304.102, the Board found that Noveon was providing "best degree of treatment" (BDT) at the Henry plant. AS 02-5, slip op at 20 (November 4, 2004). However, the Board's determination of BDT was tied to the sunset date of the adjusted standard. The Board stated:

The Board drafts this adjusted standard so that it terminates after seven years...The Board also notes that in seven years results of the water quality monitoring will be in and new, more economically reasonable technology may become available and revisiting the ammonia nitrogen issue at that time will be beneficial. Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122, AS 02-5, slip op at 21 (November 4, 2004).

If Emerald were to request renewal of AS 02-5, the Board stated that it would consider proposals for projects providing potential improvements to the Illinois River in Marshall County. AS 02-5, slip op. at 19 (November 4, 2004).

As noted in AS 02-5, the Board has granted adjusted standards in the past that have incorporated voluntary environmental projects. AS 02-5, slip op. at 19 (November 4, 2004) referring to AS 99-6, AS 91-9, and AS 99-13. In AS 99-6, the Board found the adjusted standard along with the environmental project "is a much better and more cost effective way to obtain sediment loading reductions in the watershed than employing other options to remove residuals from [the facility's wastewater]." Petition of Illinois American Water Company's (IAWC) Alton Public Water Supply Replacement Facility Discharge to the Mississippi River for an Adjusted Standard from 35 Ill. Adm. Code 302.203, 304.106, and 304.124, AS 99-6, slip op. at 20 (Sept. 7, 2000). Although AS 99-6 contained a 7-year sunset provision, the Board renewed the adjusted standard indefinitely as long as the conditions of the receiving stream do not render the adjusted standard obsolete or infeasible, the offset ratio is maintained, and the tons of soil saved from entering the project waterway is maintained above a certain level. Proposed Extension of Adjusted Standard Applicable to Illinois-American Water Company's Alton Public Water Supply Facility Discharge to the Mississippi River Under 35 Ill. Adm. Code 304.124, and 304.106, AS 07-2, slip op. at 24 (October 18, 2007). The Board also granted the adjusted standards in AS 91-9 and 99-13 indefinitely as long as conditions were met, including maintaining the benefit of the environmental project.

Owners of the Henry Plant have been petitioning the Board regarding the effluent at issue at various intervals over the past 22 years since 1991. Pet. at 1-4 referring to PCB 91-17, PCB 92-167, AS 02-5, AS 13-2. If the Board were to grant the instant adjusted standard, the Agency's recommendation requested annually recurring conditions to investigate and provide reports on new production methods and treatment technologies. Ag. Rec. at 22-23. As requested above under question 3, in lieu of conditions in the adjusted standard for another sunset provision and annually recurring requirements regarding investigations into new treatments and methods, Emerald is asked to comment on conditions, including a requirement to install and maintain a BMP to provide an environmental benefit that also addresses ammonia if Emerald plans to continue utilizing the dilution provision under 35 Ill. Adm. Code 304.102.

- (a) Please address the feasibility of Emerald considering an environmental project relating directly to nonpoint source pollution, which would provide an environmental benefit that also addresses ammonia, such as the agricultural BMPs

outlined by the Agency on its website at: <http://www.epa.state.il.us/water/nutrient>

- (b) Please indicate if Emerald would consider cost-share incentives to implement or install BMPs for an environmental project, such as applying to the Agency for funds through Section 319 (h) of the Clean Water Act nonpoint source management grants as described the Agency on its website at: <http://www.epa.state.il.us/water/financial-assistance/non-point.html> .
- (c) Please provide information on such BMPs and/or any other environmental projects that Emerald has identified or plans to research as set forth above in the Board's opinion in AS 02-5, including costs, project duration, and the quantifiable environmental benefit.

Questions for Illinois Environmental Protection Agency

5. Whole Effluent Toxicity Testing

The Agency Recommendation stated,

A recent WET [whole effluent toxicity] test with Emerald found that LC50 was <6.25% effluent for fathead minnows, a standard test organism...The laboratory did not dilute the effluent sufficiently to determine the exact LC50 value...The Emerald effluent may have been more toxic than the available dilution (47.9:1) in the ZID [zone of initial dilution] could render non-toxic. Ag. Rec. at 20-21.

- (a) Emerald submitted toxicity data into the record for a round of sampling in 2006 and four sampling events from 2011 to 2012. Resp. to HOO, Att. 4. Please indicate if the LC50<6.25% result to which the Agency refers applies to the one sampling event for January 23, 2012?
- (b) In the ZID, Emerald states the dispersion provided is 39.8:1(or 39.78:1) at 20 feet and 47.9 at 92 feet, while the dispersion required to meet the acute standard is 19.5:1 (or 19.2:1). Pet. Exh. 4 at vi, 3-14, Resp. to HOO at 10-11, 13, 15. For the toxicity data that Emerald submitted into the record, the corresponding dilution ratios appear to range from 4.4:1 to 11.8:1, with the January 23, 2012 result at >16.0:1. Except potentially for the January 23, 2012 result, the results appear to indicate LC50 was determined with less dilution than is provided or required in the ZID.

Does the Agency's statement above regarding the ability of the ZID to render the effluent non-toxic ("The Emerald effluent may have been more toxic than the available dilution (47.9:1) in the ZID could render non-toxic." Ag. Rec. at 20-21.) based only on conditions in the effluent for that one sampling event on January 23, 2012?

6. Acute and Chronic Water Quality Standards and Effluent Limitations for Total Ammonia Nitrogen

The Agency Recommendation stated,

[U]nder the current state general use water quality standards for ammonia, Emerald may have a daily maximum ammonia concentration of up to 249.5 mg/L in the Spring and Fall months and a monthly average concentration of up to 213.7 mg/L in summer months and still be compliant with the water quality standards of 5.2 mg/L acute and 0.8 mg/L chronic at the edge of the zone of initial dilution (ZID) and mixing zone, respectively. Ag. Rec. at 20.

- (a) Please indicate what pH and temperature values were used to calculate the water quality standards of 5.2 mg/L acute and 0.8 mg/L chronic stated above.
- (b) Please identify the source of these values.
- (c) Emerald states, based on IEPA's database, the annual 50th percentile background pH is 8.125 and temperature is 23.30 C. As such, Emerald calculates acute and chronic ammonia water quality standards for early life stages present of 6.62 mg/L (or 6.56 mg/L) and 1.14 mg/L, respectively. Resp. to HOO at 12-13. The Agency calculated acute and chronic standards as 5.2 mg/L and 0.8 mg/L, respectively. Ag. Rec. at 20. Please comment on the difference in the values arrived at by Emerald and the Agency.
- (d) Please show your calculations for the effluent concentrations of 249.5 mg/L and 213.7 mg/L.
- (e) Please explain whether the effluent concentrations stated on page 20 of the Agency Recommendation represent water quality based effluent limits (WQBEL).

7. WQBELs based on 2009 USEPA Draft Water Quality Criteria for Ammonia

The Agency Recommendation stated,

The current Illinois water quality standards for ammonia are based on the 1999 national criteria and therefore, if the [Draft 2009 Update Aquatic Life Ambient Water Quality Criteria for Ammonia-Freshwater, EPA-822-D-09-001] is adopted our state ammonia standards will have to be lowered by a factor of five to be identical to the new national criteria...The draft national criteria would cut the allowable effluent concentrations to approximately 50 mg/L as a daily maximum and 43 mg/L as a 30 day average. Ag. Rec. at 19-20.

- (a) Please indicate the water quality standards that were used to calculate the suggested allowable effluent concentrations under the draft national criteria of approximately 50 mg/L as a daily maximum and 43 mg/L as a 30 day average. Please indicate what pH, temperature, and draft national criteria were used (i.e. acute criterion: mussels present, acute criterion: mussels absent, chronic criterion: mussels present, chronic criterion: mussels absent and fish early life stages absent, etc.). Please show your calculations or indicate which tables of the 2009 draft national criteria the Agency used for determining the water quality standards that would be appropriate for WQBELs for Emerald.
- (b) Please show your calculations for the effluent concentrations of 50 mg/L and 43 mg/L.

8. Agency Rulemaking Proposal for 2009 USEPA Draft Water Quality Criteria for Ammonia

The Agency Recommendation states,

...if the [2009 draft national criteria] is adopted our state ammonia standards will have to be lowered by a factor of five to be identical to the new national criteria. Ag. Rec. at 20.

- a) Please indicate if USEPA has identified a date by when the final national water quality criteria for ammonia would be published.
- b) Also, is the Agency planning to submit a proposal to revise the Board's ammonia water quality standards only after USEPA finalizes the draft national criteria? If not, please indicate when the Agency plans to file a proposal to update the ammonia standards.
- c) Please address how the proposal if adopted would affect implementation of this adjusted standard if granted.

9. Recommended Conditions of the Adjusted Standard

The Agency Recommendation included a number of suggested conditions if the Board were to grant the adjusted standard. The Agency's suggested condition H reads, "Emerald investigates and submits a study to Illinois EPA on the dilution of waste water from the polymer chemicals (PC) tank with water from the Illinois River". Ag. Rec. at 23.

- (a) Would you please further explain how the Agency sees this concept contributing to reduction of ammonia in Emerald's effluent? For instance, is the idea to provide dilution before the effluent is discharged, thereby reducing the

concentration of ammonia in the effluent at the outfall?

- (b) Does the Agency believe this approach under suggested condition H could be acceptable under 35 Ill. Adm. Code 304.102(b)?
- (c) Please also comment on including conditions in the requested adjusted standard mentioned in question 3 above.