

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

IN THE MATTER OF:	)	
	)	
Petition of Emerald Polymer	)	
	)	AS 19-_____
Additives, LLC for an Adjusted	)	
	)	(Adjusted Standard)
Standard from 35 Ill. Adm. Code	)	
	)	
304.122(b)	)	

**NOTICE OF ELECTRONIC FILING**

TO:

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

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

PLEASE TAKE NOTICE that I have today electronically filed with the Office of the Clerk of the Illinois Pollution Control Board Petitioner's **NOTICE OF ELECTRONIC FILING, NOTICE OF APPEARANCE, PETITION FOR ADJUSTED STANDARD** and **CERTIFICATE OF SERVICE**, copies of which are attached herewith and served upon you.

Respectfully submitted,

Emerald Polymer Additives LLC

Date: April 3, 2019

By: /s/ Thomas W. Dimond  
 One of Its Attorneys

Thomas W. Dimond  
 Kelsey Weyhing  
**ICE MILLER LLP**  
 200 West Madison, Suite 3500  
 Chicago, Illinois 60606  
 (312) 726-1567  
[Thomas.Dimond@icemiller.com](mailto:Thomas.Dimond@icemiller.com)  
[Kelsey.Weyhing@icemiller.com](mailto:Kelsey.Weyhing@icemiller.com)

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

IN THE MATTER OF: )  
)  
Petition of Emerald Polymer )  
) AS 19-\_\_\_\_\_  
Additives, LLC for an Adjusted )  
) (Adjusted Standard)  
Standard from 35 Ill. Adm. Code )  
)  
304.122(b) )

**NOTICE OF APPEARANCE**

PLEASE TAKE NOTICE THAT, pursuant to 35 Ill. Adm. Code Section 101.400(a)(A)(4), the law firm of ICE MILLER, LLP hereby files its Appearance in this proceeding on behalf of Petitioner, Emerald Polymer Additives, LLC.

Respectfully submitted,

Emerald Polymer Additives LLC.

By: /s/ Thomas W. Dimond

By: /s/ Kelsey Weyhing

Date: April 3, 2019

Thomas W. Dimond  
Kelsey Weyhing  
**ICE MILLER LLP**  
200 West Madison, Suite 3500  
Chicago, Illinois 60606  
(312) 726-1567  
Thomas.Dimond@icemiller.com  
Kelsey.Weyhing@icemiller.com

**CERTIFICATE OF SERVICE**

I, the undersigned, certify that on April 3, 2019, I have served the attached NOTICE OF ELECTRONIC FILING, NOTICE OF APPEARANCE, and PETITION FOR ADJUSTED STANDARD upon the following persons in the manner indicated below:

Electronically, to the following person:

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

and by U.S. Mail, first class postage prepaid and electronic mail, to the following persons:

Division of Legal Counsel  
Illinois Environmental Protection Agency  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276  
epa.dlc@illinois.gov

/s/Thomas W. Dimond\_\_\_\_\_

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

IN THE MATTER OF: )  
)  
Petition of Emerald Polymer )  
) AS 19-\_\_\_\_\_  
Additives, LLC for an Adjusted )  
) (Adjusted Standard)  
Standard from 35 Ill. Adm. Code )  
)  
304.122(b) )

**PETITION FOR ADJUSTED STANDARD**

Emerald Polymer Additives, 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”), and renewed in *Petition of Emerald Performance Materials LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122*, AS-2013-002 (April 16, 2015 and December 1, 2016) (“AS 13-2”). 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”).

**INTRODUCTION**

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. The PVC resin production plant was eventually bought by Mexichem Specialty Resins, Inc. (“Mexichem”), which continues to operate the plant today. In February 2001, B.F. Goodrich sold the remaining assets of its chemical business, including the Henry Plant, to Noveon, Inc. (“Noveon”). Noveon sold the Henry Plant to The Lubrizol Company, which, in turn, sold it to a new owner that formed Emerald Performance Materials, LLC (“EPM”). EPM owned and operated the Henry Plant from May 1, 2006, until it was transferred to EPM’s affiliate Emerald Polymer Additives, LLC (“Emerald”) in 2016.

Both the PVC resin and specialty chemicals portions of the original B.F. Goodrich plant have remained mainly unchanged, despite the changes in corporate ownership with only limited curtailment and replacement of individual products. Over the past twenty-eight years there have been four 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 discharged from the Henry Plant in which the Illinois Environmental Protection Agency (“Agency”) included a 30-day average ammonia (N) effluent limitation of 3.0 milligrams per liter (“mg/L”) for ammonia (N) based on 35 Ill. Admn. Code 304.122(b) that had not been included in previous permits (“PCB 91-17”). Permit Appeal PCB 91-17 was stayed by the agreement of the parties after it was determined that the best avenue would be for B.F. Goodrich to seek a variance. In 1992, B.F. Goodrich applied for a variance

(“PCB 92-167”) , and this request was similarly stayed while B.F. Goodrich researched various technologies to reduce ammonia in its discharge. This research included internal studies of possible actions to eliminate, recover or recycle the precursors to total ammonia in the waste water and also post-generation treatment technologies. The research conducted by B.F. Goodrich, and later by Noveon, concluded that the available technologies were either not technically capable of reducing the ammonia in the discharge so as to comply with Section 304.122(b) and/or were not economically reasonable.

Because variance relief requires eventual compliance with the standard from which relief is requested, Noveon filed a petition for an adjusted standard on May 22, 2002 which was accepted by the Board and docketed as AS 02-5.<sup>1</sup> Following hearings, the Board determined that Noveon qualified for an adjusted standard and granted Noveon’s petition on November 4, 2004, with conditions. The Board concluded that the quality and composition of the wastewater produced in the Henry Plant was substantially different than wastewaters of other industries and publicly-owned treatment works (“POTWs”) because of the presence of mercaptobenzothiazole (“MBT”). MBT is a necessary chemical used in the Henry Plant process. Its presence in the plant’s wastewater inhibits the growth of bacteria that would otherwise nitrify ammonia, thereby reducing the concentration of ammonia (as N) in the Henry Plant discharge. The Board found that it had not anticipated the manufacturing processes employed at the Henry Plant when it promulgated the ammonia (N) effluent limit set forth in Section 304.122(b). Additionally, the Board found that the Henry Plant’s discharge of ammonia did not have an adverse environmental impact on the Illinois River and that no treatment alternative was both economically reasonable and technically feasible. *Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm.*

---

<sup>1</sup> Noveon withdrew its request for a variance in 2002, *see Noveon, Inc. v. Illinois Environmental Protection Agency*, PCB 92-167, Order of the Board (June 20, 2002), and the Board eventually upheld the Agency’s 1991 permit. *Noveon, Inc. v. Illinois Environmental Protection Agency*, PCB 91-17, Order of the Board (Sept. 16, 2004).

*Code 304.122*, AS-2002-05, Order of the Board, 17-18 (Nov. 4, 2004). The Board placed conditions on the adjusted standard, including that Emerald install and operate a high-rate, multi-port diffuser that it had proposed and that Emerald's ammonia discharge not exceed a concentration of 155.0 mg/L. *Id.*, 22-23.

Emerald completed installation of the multi-port diffuser in October 4, 2005. After it purchased the Henry Plant in 2006, Emerald engaged in a number of projects and investigations to facilitate the reduction of the ammonia effluent. Emerald also conducted studies to demonstrate that its discharge did not negatively impact the environment. Testing done quarterly beginning in 2007 established that ammonia levels in the Illinois River complied with the acute and chronic water quality standards for ammonia nitrogen and were not adversely impacted by the Henry Plant's wastewater discharge. The laboratory usually could not detect ammonia at all, and the results exceeded 1.0 mg/L only once (September 2012). See **Exhibit 5** (annual reports to the Agency including test results). In 2011 and 2012, Emerald collected effluent samples to conduct whole effluent toxicity ("WET") tests on laboratory aquatic organisms in accordance with its NPDES permit. The results indicated that Emerald's effluent was not toxic at the dilution factors achieved by the multi-port diffuser. See **Exhibit 7** (letters to Agency with laboratory reports of toxicity tests).

Emerald filed a petition to renew the adjusted standard on September 28, 2012. Around this time Emerald reviewed the previously considered alternatives and investigated five new technologies to reduce ammonia, concluding that no treatment alternative was both technically feasible and economically reasonable. Finding that Emerald provided sufficient justification for each of the statutory factors governing the issuance of an adjusted standard, the Board granted

Emerald's petition in AS 13-2. A copy of the Board's April 2015 Opinion and Order in AS 13-2 is included as Exhibit 1 to this Petition and is incorporated herein by reference.

In granting Emerald's petition in AS 13-2, the Board imposed a number of conditions on Emerald including limiting the Henry Plant discharge to not more than a calculated total ammonia nitrogen concentration of 140 mg/L at any time and 110 mg/L as a 30-day average; continued use of the multi-port diffuser; investigation of new production methods and technologies to generate less ammonia and nitrification inhibitors in the discharge; investigation of new treatment technologies and to evaluate the implementation of new and existing treatment technologies; investigation of three specific control alternatives, including the use of granulated activated carbon; and submission of reports to the Agency detailing the status of complying with these requirements. *See* Ex. 1, 68-70.

While most of the conditions were similar to conditions in the 2004 adjusted standard, conditions in Emerald's wastewater discharge permit, or were otherwise agreed between Emerald and the Agency, three conditions were entirely new or substantially altered from the agreement with the Agency: (1) Condition 2(h), imposing a pre-condition on EPM's right to renew or modify the adjusted standard, i.e., the reduction of ammonia discharges from third-party agricultural sites through best management practices ("BMPs") to offset EPM's ammonia discharges by a minimum of 45 percent; (2) Condition 2(b), requiring, among other things, that EPM incorporate ammonia nitrogen as a metric in an employee bonus plan; and (3) a five year sunset on the adjusted standard included in Condition 1. *Id.*

On July 22, 2015 Emerald filed an appeal from these three conditions in the Illinois Appellate Court. The Appellate Court issued its opinion on September 2, 2016. *Emerald Performance Materials, LLC v. The Illinois Pollution Control Board*, 2016 IL App (3d) 150526.

The Appellate Court held that Condition 2(h) and the portion of Condition 2(b) related to the bonus plan were improper, but upheld the five year sunset provision. *Id.* at ¶¶ 27-37, 41. Thus, the order of the Pollution Control Board in AS 13-2 was affirmed in part, reversed in part and remanded. *Id.* at ¶ 43. Neither party appealed further, and the Board modified the adjusted standard to conform to the Appellate Court opinion in an order dated December 1, 2016, which is included as **Exhibit 2** to this Petition and incorporated by reference herein.

Emerald proceeded to comply with the remaining conditions imposed by the Board, as will be described below. Emerald timely applied for renewal of its NPDES Permit No. IL0001392, and the Agency issued the renewal effective October 1, 2016. A copy of Emerald's current NPDES permit is included as **Exhibit 3** to this Petition.

#### **EMERALD'S EFFORTS TO COMPLY WITH BOARD ORDER IN AS 13-2**

Emerald has complied with all conditions imposed by the Board in AS 13-2. As an initial matter, Emerald's monthly DMRs indicate that emission limits for total ammonia nitrogen at the Henry Plant have not exceeded the maximums of 140 mg/L and 1,633 pounds/day (lbs/day) or the 30-day averages of 110 mg/L and 841 lbs/day, as required by AS 13-2 Condition 1. Emerald has prepared annual summaries of the monitoring results that it reported to the Agency for 2013 through 2018, including the following parameters: ammonia nitrogen as N (in both mg/L and lbs/day), biological oxygen demand ("BOD"), pH and temperature, among others. The annual summaries are included in this Petition as **Exhibit 4** and incorporated by reference herein. From April 16, 2015 through 2018, the highest daily maximum ammonia nitrogen concentration in each year ranged from 100.0 to 130.0 mg/L, but never exceeded the daily maximum limit of 140.0 mg/L established in AS13-2. Over the same period, the highest daily maximum ammonia load in each year ranged from 454.27 to 553.36 lbs/day, but never exceeded the daily maximum

limit of 1,633 lbs/day established in AS13-2. From April 16, 2015 through 2018, the highest 30-day average ammonia concentration in each year ranged from 85.62 to 101.81 mg/L, and the highest 30-day average ammonia load in each year ranged from 371.41 to 429.98 lbs/day. These highest 30-day average figures also complied with the limits set in AS13-2.

As to Conditions 2(a) and 2(b) of AS 13-2, Emerald has maintained the high-rate, multi-port diffuser for the discharge into the Illinois River and has also maintained the following ammonia reduction measures: replacement of the BBTS Wet Scrubber with a dust collector and upgrade of instrumentation for the acetonitrile recovery column.

In compliance with Conditions 2(c) and (d) of AS 13-2, the Henry Plant has put together a continuous process improvement project to identify and evaluate potential modifications of the processes and product formulations to recover MBT as well as a few of the key organic nitrogen compounds that serve as the building blocks for most of Emerald's products. The team is comprised of facility personnel, consultants, and process improvement engineers from Emerald corporate services. The approaches taken by this team to evaluate process modifications and alternative treatment options to achieve the final goal of further reducing ammonia in the Emerald effluent have, to date, not identified any options to further reduce ammonia in the Henry Plant discharge. *See* Section V., below. The results of these efforts were reported to the Agency in the annual reports required by Condition 2(f). Emerald's annual reports pursuant to AS 13-2 are included as **Exhibit 6** to this Petition and incorporated by reference herein.

Emerald continues to investigate new technologies to reduce ammonia in compliance with Conditions 2(c) and 2(d). Emerald currently has several initiatives underway, including improvements to the control and reaction processes at Henry Plant and renovations to put the west biotreater back online. However, data is not yet available to assess the impact of these

efforts on ammonia nitrogen discharge levels or the cost and economic reasonableness of the efforts.

Condition 2(e) of AS13-2 requires Emerald to study the technical feasibility and economic reasonableness of specific compliance options. On April 13, 2018, Brown and Caldwell (“B&C”) completed a technical evaluation of the Henry Plant, including bench scale treatability testing and developing a preliminary design and cost estimate of treatment alternatives in order to satisfy Conditions 2(e)(i) and (iii) of AS 13-2. These compliance alternatives are described as follows: (1) provide granulated activated carbon (“GAC”) treatment of the polymer chemicals (“PC”) wastewater to remove MBT so that nitrification can occur; and (2) river water dilution to the primary clarifier effluent so that MBT may be diluted and nitrification can occur. *See* Ex. 2, 2-3. B&C’s memorandum entitled “Henry Nitrification Evaluation” was submitted to the Agency on April 17, 2018 as part of Emerald’s 2018 update report pursuant to AS 13-2 and is incorporated herein. *See* Ex. 6.

The results showed that, at least at a bench scale, GAC pretreatment of plant wastewater would sufficiently reduce MBT concentrations to allow the microorganisms in the plant wastewater to achieve adequate nitrification. B&C also evaluated the cost of this alternative and found that its estimated cost is 20 times higher than the costs incurred by municipal POTWs in Illinois and 11 times higher than the average cost of municipal POTWs nationwide. Accordingly, Emerald reported to the Agency that GAC is not an economically reasonable treatment alternative.

B&C also evaluated dilution of plant wastewater with river water, finding that nitrification could be achieved if the plant wastewater was diluted by 90%. However, B&C cautioned that the bench scale results might not be sustainable at plant-scale due to fluctuations

in MBT production that would cause inconsistent nitrification and cold weather river water temperatures which would interfere with other treatment processes that require the wastewater to be warmer to be effective. To address the seasonal impacts of cold river water, this approach would require installation of a boiler to maintain wastewater temperature, which would cause ancillary negative environmental impacts in the form of additional air emissions. Assuming the boiler ran for seven months of the year, was natural gas-fired, equipped with low-NO<sub>x</sub> burners and flue gas recirculation, it could emit as much as 38,000 metric tons of CO<sub>2e</sub> greenhouse gases, 35 tons of nitrogen oxides and 30 tons of carbon monoxide to heat the diluted wastewater. Given that the ammonia concentrations in the Henry Plant discharge have been shown not to violate acute or chronic ammonia water quality standards or to otherwise negatively impact the environment, these ancillary negative impacts on air emissions negate any possible benefit associated with potential reduction in ammonia concentrations of the effluent.

Further, B&C found that the estimated cost of this alternative (even without including the boiler cost) is 40 times higher than the costs incurred by municipal POTWs in Illinois and 21 times higher than the average cost of municipal POTWs nationwide. Based on the B&C report and Emerald's own evaluation, Emerald reported to the Agency that the river water alternative is not technically feasible or economically reasonable for three reasons: first, the option is not likely to consistently achieve the desired ammonia removal; second, the negative air emission impacts outweigh the benefits of any reduction in the ammonia discharged; and, finally, the economic cost is prohibitive as demonstrated by B&C.

Emerald also investigated the technical feasibility of spray irrigation of the plant's treated wastewater in compliance with Condition 2(e)(ii) of AS 13-2. *See* Ex. 2, 3. Based on its investigation, Emerald concluded that spray irrigation is not a technically feasible option for the

Henry Plant's treated wastewater. Emerald noted that crop irrigation and nitrogen needs do not occur continuously through the growing season and cease entirely outside the growing season. In contrast, the Henry Plant's discharge occurs throughout the year with ammonia levels that fluctuate with production. Thus, even during the growing season, it would be extremely difficult to match crop ammonia needs with ammonia levels in the Henry Plant discharge. Outside the growing season, there would be no need for crop irrigation or nitrogen. In addition, the regulation which is cited in Condition 2(e)(ii) as the basis for the spray irrigation idea, only authorizes the "land application of secondary and tertiary treated *domestic wastewater . . .*" See 35 Ill. Adm. Code 372.110(a) (emphasis added). Part 372 does not authorize the land application of industrial wastewater, which might violate federal restrictions on the land disposal of wastes. See Ex. 6 (Emerald letter dated April 17, 2018).

Annual reports summarizing the work and studies undertaken to comply with Conditions 2(c) through 2(e) of AS13-2 have been prepared and submitted to the Agency by Emerald as required in Condition 2(f) of AS 13-2. See Ex. 6.

Condition 2(g) purports to authorize the Agency to petition the Board to modify the final order in AS13-2<sup>2</sup> if the Agency, after reviewing Emerald's annual reports, "determines that new technology to treat ammonia is available that is economically reasonable and technically feasible[.]" See Ex. 2, 3. Emerald has received no notice of such a determination by the Agency. The Agency has not filed any such petition.

Finally, Emerald has operated the wastewater treatment system in substantial compliance with the Clean Water Act, the requirements of its NPDES Permit and the Board's water pollution regulations, as required by Condition 2(h). Since January 1, 2012, Emerald has received three

---

<sup>2</sup> The validity of Condition 2(g), which seems inconsistent with the Board's procedural rules that generally apply to a party seeking relief from a final opinion and order of the Board, 35 Ill. Adm. Code 101.904, is unclear. In any event, as noted in the text, Emerald has complied with Condition 2(g).

violation notices from the Agency. Two were resolved via compliance commitment agreements and the third is pending. The first is Violation Notice No. W-2013-50153, sent by letter dated June 24, 2013. This notice alleged violations of NPDES numeric limits for BOD, fecal coliform, total suspended solids (“TSS”) and chlorobenzene on specific dates between January 31 and May 31, 2013. The notice also alleged a single violation of the ammonia nitrogen limit on January 31, 2013. Emerald responded to the notice, in part, by explaining that the alleged ammonia exceedance was statistically in compliance with the permit limit and by proposing a Compliance Commitment Agreement. The Compliance Commitment Agreement was approved by the Agency on October 9, 2013 and Emerald sent its signed Compliance Statement on February 21, 2014. A copy of Violation Notice No. W-2013-5013 and associated documentation is included as **Exhibit 8** to this Petition.

The second is Violation Notice No. W-2015-50227, sent by letter dated September 25, 2015. This notice alleged violations of NPDES numeric limits for total cyanide, total phenolics, chlorobenzene, TSS and carbonaceous BOD on specific dates between March 31 and May 31, 2015. Emerald again responded with explanations and by proposing a Compliance Commitment Agreement. The Compliance Commitment Agreement was approved by the Agency on November 18, 2015 and Emerald sent its signed Compliance Statement on November 23, 2015. A copy of Violation Notice No. W-2015-50227 and associated documentation is included as **Exhibit 9** to this Petition.

The final one is Violation Notice No. W-2019-50007 dated March 18, 2019. This notice alleged violations of NPDES numeric limits for TSS and fecal coliform on specific dates during 2018 and the failure to submit the annual facility inspection report for its stormwater pollution prevention plan for 2018. Emerald is currently evaluating this Violation Notice and will respond

in a timely manner. A copy of Violation Notice No. W-2019-50007 is included as **Exhibit 10** to this Petition.

There have been no violations of the ammonia concentration and load limits established in AS13-2. Based upon this record, Emerald has complied with all of the terms the Board imposed in AS 13-2 as conditions to the grant of regulatory relief.

In addition, Emerald conducted WET toxicity testing and submitted the results to the Agency in 2011 and 2012 pursuant to Special Condition 14 of its NPDES permit (effective May 1, 2007) and in 2017 pursuant to Special Condition 14 of its NPDES permit (effective October 1, 2016). Each test result showed that the effluent would not be toxic at the dilution factors achieved by the multi-port diffuser installed and operated pursuant to the Board's adjusted standards. *See* Ex. 7. An update of this test has been initiated and will be provided to the Agency and the Board when completed.

As discussed in Section VII., below, testing done quarterly from 2007 to 2015 established that ammonia levels in the Illinois River downstream of the Henry Plant's wastewater discharge complied with the acute and chronic water quality standards for ammonia nitrogen. Most of those test results were unable to detect ammonia in the Illinois River. *See* Ex. 5 (annual reports to the Agency including Illinois River testing results). The highest detected value over nine years of testing was only 1.1 mg/L in September 2012, and ammonia was not detected over the last seven quarters of testing ending in November 2015. The Agency eliminated this testing requirement from the Henry Plant's NPDES permit in 2016.

### **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

complied with the terms and conditions imposed by the Board in granting such relief, Emerald will rely upon portions of the evidence from the petition filed in AS 13-2 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 13-2 where the documents can be found is also included, as appropriate.

**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 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.

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 (“DO”) at some locations in the river.

**II. Statement Regarding Basis of Standard – Section 104.406(b)**

The regulation of general applicability from which Emerald seeks an adjusted standard was not promulgated to implement, in whole or in part, the requirements of the Clean Water Act (33 U.S.C. 1251 et seq.), Safe Drinking Water Act (42 U.S.C. 300(f) et seq.), Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9601 et seq.), Clean Air

Act (42 U.S.C. 7401 et seq.), or the State programs concerning RCRA, UIC, or NPDES (see 415 ILCS 5/28.1).

**III. 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 13-2, and were relied upon by the Board when it granted relief in AS 13-2, are discussed in Section VIII., below.

**IV. 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 Henry Plant until it consolidated with the M.A. Hanna Company on August 31, 2000 forming PolyOne. The PVC resin production plant was eventually bought by Mexichem, which still operates the plant today. In 2001 the B. F. Goodrich Company sold all the assets of its chemical business, including the Henry Plant, to Noveon. In 2004, Noveon sold a portion of its specialty chemical operations, including the Henry Plant, to The Lubrizol Company (“Lubrizol”). Lubrizol sold the Henry Plant to EPM in 2006, and EPM transferred the plant to its affiliate Emerald in 2016. EPM or Emerald have owned and operated the Henry Plant since May 1, 2006.

Today, both Mexichem and Emerald continue to operate facilities at the Henry site in basically the same manner as was presented in AS 02-5 and AS 13-2. The wastewater treatment system is owned and operated by Emerald, and the system continues to treat the wastewater from both Mexichem's and Emerald's Henry Plant processes pursuant to a service agreement. During 2016 through 2018, the system treated approximately 500,000 gallons per day ("gpd") of combined effluent from Mexichem's operation, Emerald's operations and combined utility and potential contact storm water. This flow rate is somewhat lower than the treatment facility's design value and in past years due to lower production levels. Emerald currently employs approximately 66 people and Mexichem employs approximately 70 people.

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. 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.<sup>3</sup> As such, the Henry plant is now one of only two providers of MBT-based accelerators in the U.S. Lanxess is the other provider; they import MBT from their facility in Antwerp (Belgium) and produce accelerators at their Bushy Park, South Carolina plant. The Emerald Henry plant is the sole U.S. producer of the following accelerator chemicals: Cure-Rite 18<sup>®</sup>, OBTS, and 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 Cure-Rite 18<sup>®</sup> 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

---

<sup>3</sup> The last two other MBT producers in the U.S shut down their facilities in the last few decades. Flexsys exited its Nitro, West Virginia plant in 2004 and Chemtura shut down its Geismar, Louisiana accelerator unit and MBT production in 2006.

(NaSH) system in 2006. The NaSH system does not produce any appreciable process wastewater and what is produced has no ammonia or ammonia precursors.

Mexichem produces 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. Mexichem'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 Mexichem 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. Mexichem 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 Mexichem 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%

BOD reduction while discharging ammonia nitrogen in the range of 1.0 to 130.0 mg/L from 2015 to the present. *See* Ex. 4.

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<sup>®</sup> (a/k/a the "C-18") equalization tank. Waste activated sludge and solids from the Mexichem 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, and 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 biotreaters, 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 biotreaters.

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 POTW 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 (primarily west and south) to the Mississippi River, near Grafton,

Illinois, which is a few miles upstream from St. Louis. The Henry Plant is located to the west of the river between river mile 198 and 199.

The United States Geological Survey (“USGS”) has operated a gauging station near Henry since October 1981 (USGS Gage 05558300). The river has a drainage area of approximately 13,544 square miles at Henry and an annual mean flow of 16,200 cubic feet per second (“cfs”) for water year 2018 and 15,550 cfs for water years 1982-2018. For water year 2018, the annual 7-day minimum flow was 3,176 cfs. See [https://nwis.waterdata.usgs.gov/nwis/wys\\_rpt?dv\\_ts\\_ids=48987&wys\\_water\\_yr=2018&site\\_no=05558300&agency\\_cd=USGS&adr\\_water\\_years=2006%2C2007%2C2008%2C2009%2C2010%2C2011%2C2012%2C2013%2C2014%2C2015%2C2016%2C2017%2C2018&referred\\_module](https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=48987&wys_water_yr=2018&site_no=05558300&agency_cd=USGS&adr_water_years=2006%2C2007%2C2008%2C2009%2C2010%2C2011%2C2012%2C2013%2C2014%2C2015%2C2016%2C2017%2C2018&referred_module) = (last visited Mar. 25, 2019). At Henry, the river is approximately 875 feet wide with an average depth of 11 feet and an approximate maximum depth of 18 feet. The Illinois State Water Survey reported an annual 7-day, 10-year low flow for the river at Henry of 3,400 cfs in 1988. See Map-4-Spoon-River-Region-1988 at <http://hdl.handle.net/2142/100100> (last visited Mar. 25, 2019).

#### **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 the discharge has been determined to completely mix within an approved ZID and mixing zone. Based on an analysis of the Henry Plant discharge using data from the Illinois River, AquAeTer calculated that the minimum dispersion required to meet the acute ammonia

standard is 11.5:1 and to meet the chronic ammonia standard is 68.1:1. Their previous work showed that the multi-port diffuser achieves a dispersion of 39.7:1 in the ZID (equivalent to about 2.5% effluent) 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 had an ammonia concentration ranging from 23 to 150 mg/L with the exception of two three-day periods where the concentration exceeded 155 and reached as high as 180 mg/L of ammonia. Based on an analysis of the Henry Plant discharge, AquAeTer 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. These findings were presented to the Board in AS 13-2. *See* Ex. 1, 13-14.

Emerald has maintained a similar, though marginally lower, range of daily ammonia concentrations since filing its petition in AS 13-2. Emerald's DMR data shows that for calendar years 2013 through 2018, the effluent from the Henry Plant has had an ammonia concentration ranging from 1.0 to 160.0 mg/L. *See* Ex. 4. The only exceedance of a daily maximum ammonia concentration limit occurred on January 23, 2013, when the measured concentration of 160.0 mg/L exceeded the AS 02-05 maximum limit of 155.0 mg/L. As Emerald explained in response to a violation notice from the Agency, the error range of the EPA test method was such that the test result was statistically compliant with the maximum limit. *See* Ex. 8 (letter dated August 5, 2013 explaining lack of statistical significance of exceedance). Since the adoption of the 140.0 mg/L daily maximum concentration limit and the 1,633 lbs/day daily maximum load limit in AS13-2, Emerald has reported no exceedances of those limits based on sampling five times per

week. Likewise, the sampling from 2015-2018 shows no exceedances of the 30-day average limits for concentration or load of ammonia established in AS 13-2. *See* above at 6-7.

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.

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

Prior to filing its petition for an adjusted standard in 2002, Noveon and its environmental consultant, B&C f/k/a Eckenfelder Inc., examined a variety of methods to reduce the level of ammonia nitrogen in the Henry Plant wastewater effluent. Noveon's findings were presented in AS 02-15. Thereafter, Emerald, with continued assistance from B&C, presented its findings with regard to treatment alternatives in AS 13-2. *See* Ex. 1, 24-33. At both times, B&C concluded that there were no treatment alternatives that would both reliably reduce the effluent ammonia nitrogen concentrations low enough to comply with Section 304.122 (i.e., were technically feasible) and be economically reasonable. Recent testing by B&C in 2018 confirms that there has been no material change in available technologies or costs so as to change this conclusion.

**A. Evaluation of Compliance Alternatives in 2002 and 2012**

Testing conducted during the late 1980's through December 1995 demonstrated that the Henry Plant could not achieve single stage biological nitrification of ammonia 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,

including in-process reductions, pretreatment options and post-treatment options. B&C tested and reported on several post-treatment alternatives in its 2004 report, which was submitted to the Board in AS 02-5.

These post-treatment alternatives are:

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; and
6. Ion exchange treatment of final effluent.

B&C also testified in AS 02-5 regarding its subsequent evaluation of ozonation and tertiary nitrification as additional potential compliance alternatives. Each of the above alternatives was rejected as not technically feasible, not economically reasonable or both.

Prior to filing its petition for an adjusted standard in 2012, Emerald retained B&C to review the conclusions presented in AS 02-5 and determine what, if any, changes had occurred since 2004. B&C noted that changes made to the wastewater treatment system since 2002 did not cause any appreciable change in the available alternatives. B&C reconsidered the compliance alternatives examined in 2004, and also explored the following:

1. CASTion Ammonia Recovery Process (ARP);
2. Ostara Pearl;
3. Liqui-Cel Membrane;
4. Anammox; and
5. Anodic Oxidation.

Again, all of the alternatives examined by B&C were rejected as not technically feasible, not economically reasonable or both. B&C's findings are discussed in detail in AS 13-2, and are incorporated herein by reference. *See* Ex. 1, 24-32. Based on its process knowledge and knowledge of costs for treating wastewater streams, Emerald believes the alternatives evaluated in 2002 and 2012 remain technically infeasible, economically unreasonable or both.

**B. Evaluation of Additional Compliance Alternatives Reported in April 2018**

As described above, in April 2018, B&C evaluated the following treatment alternatives pursuant to AS 13-2: (1) GAC treatment of the polymer chemicals ("PC") wastewater to remove MBT so that nitrification can occur; and (2) river water dilution to the primary clarifier effluent so that MBT may be diluted and nitrification can occur. With regard to GAC, the results showed that, at least at a bench scale, GAC pretreatment of plant wastewater would sufficiently reduce MBT concentrations to allow the microorganisms in the plant wastewater to achieve adequate nitrification. However, B&C concluded that the estimated cost of this treatment alternative is 20 times higher than the costs incurred by municipal POTWs in Illinois and 11 times higher than the average cost of municipal POTWs nationwide. Based on these findings, GAC is not an economically reasonable treatment alternative at the Henry Plant. *See* Ex. 6 (Brown & Caldwell Technical Memorandum, 12-15).

Based on the B&C report and Emerald's own evaluation, the river water dilution alternative is not technically feasible or economically reasonable for three reasons: (1) the option is not likely to achieve the desired ammonia removal; (2) the ancillary environmental impacts outweigh the benefits of any reduction in the ammonia discharged; and (3) the economic cost is prohibitive. For the reasons described in the B&C report, the river water dilution option cannot consistently achieve ammonia reductions that were achieved in the bench scale testing.

First, treatment of plant wastewater via river water dilution was evaluated at a bench scale by B&C. In the bench scale testing, B&C found that nitrification could be achieved if the plant wastewater were diluted by 90% with river water. B&C cautioned, however, that the bench scale results might not be sustainable at plant-scale due to fluctuations in MBT production that would cause inconsistent nitrification and cold weather river water temperatures which would interfere with other wastewater treatment processes that require warm wastewater. B&C also evaluated the cost of this alternative and found that its estimated cost (even without including the capital cost of constructing an additional steam boiler, as discussed below) is 40 times higher than the costs incurred by municipal POTWs in Illinois and 21 times higher than the average cost of municipal POTWs nationwide. Also, diluting the Henry Plant's wastewater by a factor of almost ten will also dilute the chemicals that the microorganisms metabolize. This may compromise the efficiency of the wastewater treatment plant, hampering the microbial degradation of the other contaminants. Thus, purely from the standpoint of the wastewater discharge, the river water dilution option is not technically feasible. *See* Ex. 6 (Emerald letter dated April 17, 2018, 3 and Brown & Caldwell Technical Memorandum, 12-13 & 15-16).

Second, because the Illinois River temperature is much colder than the optimal treatment system temperature in late fall, winter and early spring, this approach would require the installation of a 140 million Btu per hour boiler to provide additional steam in order to maintain the required temperature range. Assuming the boiler ran for seven months of the year, was natural gas-fired, equipped with low-NO<sub>x</sub> burners and flue gas recirculation, it could emit as much as 38,000 metric tons of CO<sub>2</sub>e greenhouse gases, 35 tons of nitrogen oxides and 30 tons of carbon monoxide to heat the river water. The atmospheric emissions coupled with the additional

heat load discharged to the Illinois River would negate any benefit associated with the potential reduction in ammonia in the effluent. *See* Ex. 6 (Emerald letter dated April 17, 2018, 3-4).

Finally, even without taking into account the additional cost of the boiler, the B&C report estimated that the cost of the river dilution alternative is 41 times higher than the costs incurred by municipal POTWs in Illinois and 21 times higher than the average cost of municipal POTWs nationwide. *See* Ex. 6 (Brown & Caldwell Technical Memorandum, 15-16).

Emerald also investigated the technical feasibility of spray irrigation of the plant's treated wastewater. Based on that investigation, spray irrigation is not a technically feasible option for the Henry Plant's treated wastewater. Crop irrigation and nitrogen needs do not occur continuously through the growing season and cease entirely outside the growing season. In contrast, the Henry Plant's discharge occurs throughout the year with ammonia levels that fluctuate with production. Thus, even during the growing season, it would be extremely difficult to match crop ammonia needs with ammonia levels in the Henry Plant discharge. Outside the growing season, there would be no need for crop irrigation or nitrogen. In addition, the regulation, which the Agency proposed as the basis for the spray irrigation idea, only authorizes the "land application of secondary and tertiary treated *domestic wastewater*["] *See* 35 Ill. Adm. Code 372.110(a) (emphasis added). Part 372 does not authorize the land application of industrial wastewater, which might violate federal restrictions on the land disposal of wastes. *See* Ex. 6 (Emerald letter dated April 17, 2018, 2-3).

In sum, Emerald and the previous owners of the Henry Plant and their consultant, B&C, have evaluated a large 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 evaluations demonstrate that, as was found by

the Board in AS 13-2, 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).

**VI. 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:

1. Pursuant to Section 28.1 of the Environmental Protection Act (415 ILCS 5/28.1 (2012)), the Board grants Emerald Polymer Additives, LLC (Emerald) an adjusted standard from 35 Ill. Adm. Code 304.122(b). Under this adjusted standard, the total ammonia nitrogen effluent standard at 35 Ill. Adm. Code 304.122(b) does not apply to the discharge of effluent into the Illinois River from the Emerald facility at 1550 County Road 1450 N. in Henry, Marshall County. Instead, Emerald's effluent for total ammonia nitrogen must comply with a daily maximum of 140 milligrams per liter (mg/L) and 1633 pounds per day (lbs/day), as well as a 30-day average of 110 mg/L and 841 lbs/day.
2. The adjusted standard granted in paragraph 1 of this order is subject to the following conditions:
  - a. Emerald must continue to maintain the high-rate, multi-port diffuser for the discharge into the Illinois River to achieve an effluent dispersion necessary to meet the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and zone of initial dilution (ZID).
  - b. Emerald must maintain the following ammonia reduction measures: replacement of the BBTS Wet Scrubber with a dust collector; and upgrade of instrumentation for the acetonitrile recovery column.
  - c. Emerald must investigate new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald's discharge. The nitrification inhibitors such as MBT are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.
  - d. Emerald must investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions.
  - e. Emerald must prepare and submit to the Agency annual reports summarizing its activities to comply with paragraphs 2(c) and 2(d).

This proposed language for the renewed adjusted standard is substantially the same as the adjusted standard finalized by the Board in December 2016, except for the following. First, the effective date range in AS 13-2, Condition 1 has been omitted. Second, AS 13-2, Condition 2(e) has been omitted because those specific studies have been completed and need not be repeated. Next, AS 13-2, Condition 2(g) has been omitted because it is inconsistent with the Board's procedural rule for a party to seek relief from a final opinion and order, 35 Ill. Adm. Code 101.904. Last, AS 13-2, Condition 2(h) has been omitted because it purports to incorporate into the adjusted standard requirements that are otherwise applicable to Emerald pursuant to law or the Henry Plant's NPDES permit and do not relate to the subject of the adjusted standard, i.e., the plant's ammonia discharge.

**VII. 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 municipal POTW 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. *See Ex. 1, 40-41.* 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 was conducted from 2007 through 2015 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. During the nine years of testing, the laboratory usually could not detect ammonia, including no detections for the last seven quarters of testing ending in November 2015. The results exceeded 1.0 mg/L only once (September 2012). *See Ex.5* (annual reports to the Agency

including test results). In 2016, the Agency eliminated this testing requirement from Emerald's NPDES permit.

Emerald also conducted WET toxicity testing and submitted the results to the Agency in 2011, 2012 and 2017 pursuant to conditions in its then-effective NPDES permits. Pursuant to the conditions, an acute LC<sub>50</sub> greater than 2.1% effluent is deemed acceptable and does not require further investigation. *See* Ex. 3, p. 7. This threshold value appears to be roughly based on the dispersion of 39.7:1 (approximately 2.5% effluent) at the edge of the ZID achieved by Emerald's multi-port diffuser. Each test result estimated LC<sub>50</sub> values for the test organisms (*pimephales promelas*, fathead minnow, and *ceriodaphnia dubia*, water flea) at an effluent dilution ranging from 3.78% to 31.86%. *See* Ex. 7. Thus, no further investigation was required and these results show that the effluent is not toxic at the edge of the ZID achieved by the multi-port diffuser installed and operated by Emerald consistent with the Board's adjusted standards.

All the new evidence subsequent to the issuance of the adjusted standard in AS 13-2 confirms that no adverse environmental impact, including harm to aquatic life, will result from the granting of the requested adjusted standard.

#### **VIII. Justification for Adjusted Standard – 104.406(h)**

Section 302.144(b) does not specify a standard-specific level of justification. Thus, under Section 28.1(c) of the Act the Board may grant an adjusted standard 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 cost-effectively 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 for municipal POTWs and other large volume dischargers. 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. *See* Ex. 1, 40-41. 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. And, in fact, in identifying impairments to the Illinois River under the Clean Water Act, the Agency has not identified the Illinois River as impaired for DO in the vicinity of the Henry Plant. The Henry Plant discharges into Segment D-

09 of the Illinois River, which is listed as impaired only for mercury and polychlorinated biphenyls. *See* 2018 Illinois Integrated Water Quality Report and Section 303(d) List, Appendix A-2, pp. 22-23, <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/303d-list.aspx> (last visited Mar. 25, 2019). Nor will the Henry Plant discharge contribute to any water quality violations or harm to aquatic life as discussed in Section VII., 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. The Board has previously made this finding and there is no new evidence to reach a different finding today. *See* Ex. 1, 40-41.

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

Two factors that must be taken into consideration when adopting environmental regulations in the State of Illinois are technical feasibility and economic reasonableness. 415 ILCS 5/27(a). 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 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). As discussed in Section VII., above, Emerald's studies have shown that its effluent has not caused violations of the acute or chronic water quality standards for ammonia in the Illinois River. Further, the Illinois River is not impaired for DO in the area of the Henry Plant. *See* Section VIII.1., above. Given the lack of any discernible environmental benefit, the technical infeasibility of many alternatives and the high cost of the technically feasible control technologies, the requested adjusted standard relief is warranted for Emerald. The Board reached this conclusion in 2015,

and no new evidence has come to light that would justify altering that conclusion now. *See* Ex. 1, 42-57.

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 above in Section IV.D., the discharge from the Henry Plant meets the winter and summer acute water quality standards for total ammonia nitrogen as N at the edge of the ZID approved by the Agency. The winter and summer acute and chronic standards were also met at the edge of a mixing zone approved by the Agency. In addition, WET toxicity testing of the Henry Plant's discharge has not identified any toxic impacts from the discharge considering the dilution achieved by the multi-port diffuser. *See* Section VII., above. Thus, the impact, if any, will not be significantly more adverse than that contemplated by the regulation of general applicability. The Board previously concluded that Emerald's requested adjusted standard would not cause negative environmental or health impacts and the Appellate Court upheld that finding. *See* Ex. 1, 61-62; *Emerald Performance Materials, LLC*, 2016 IL App. 150526, ¶¶ 30-31.

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.

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 for ammonia (which were established at a level to protect aquatic life) have been and are being met with an appropriately calculated zone of initial dilution and mixing zone so as to be fully supportive of all beneficial uses. *See* Section VII., above. As with the other Section 28.1(c) criteria, nothing has changed

since 2015 that would justify the Board in changing its conclusion that the proposed adjusted standard is consistent with federal law. *See* Ex. 1, 63.

**IX. Consistency with Federal Law – Section 104.406(i)**

For the reasons set forth in Section VIII.D.4., above, the Board may grant this adjusted standard consistent with federal law. There are no federal procedural requirements beyond those required by Subpart D of the Board's procedural rules.

**X. Waiver of Hearing -- Section 104.406(j)**

Emerald requests a hearing in this matter.

**XI. Supporting Documents -- Section 104.406(k)**

Supporting documents cited in this Petition are attached as Exhibits 1 through 12.

**XII. Additional Information – Section 104.406(l)**

Because 35 Ill. Adm. Code § 302.144(b) does not specify a standard-specific level of justification for an adjusted standard or additional information requirements, Emerald has no additional information to submit.

**XIII. Petition Verification**

The affidavit of Galen Hathcock is attached as Exhibit 12 verifying the material facts set forth in this Petition.

**CONCLUSION**

Emerald and the previous owners of the Henry Plant have explored a large 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 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 and AS 13-2, and in 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.

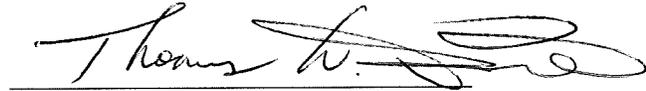
WHEREFORE, Emerald respectfully requests that the Board grant Emerald an adjusted standard from 35 Ill. Adm. Code 304.122(b), subject to the conditions proposed herein, for the wastewater discharged from the Henry Plant consistent with its orders in AS 02-5 and AS 13-2.

Respectfully submitted,

Emerald Polymer Additives LLC.

April 3, 2019

By:



One of Its Attorneys

Thomas W. Dimond  
Kelsey Weyhing  
**ICE MILLER LLP**  
200 West Madison, Suite 3500  
Chicago, Illinois 60606  
(312) 726-1567  
[Thomas.Dimond@icemiller.com](mailto:Thomas.Dimond@icemiller.com)  
[Kelsey.Weyhing@icemiller.com](mailto:Kelsey.Weyhing@icemiller.com)

**Exhibit List**

1. Board's April 16, 2015 Opinion and Order in AS 13-2.
2. Board's December 1, 2016 Opinion and Order in AS 13-2.
3. NPDES Permit No. IL0001392 dated September 28, 2016.
4. Annual summaries of Emerald-Henry Plant DMR Data (2013 through 2018).
5. Emerald's Annual Update Reports pursuant to AS 02-05 and NPDES Permit.
6. Emerald's Annual Update Reports pursuant to AS 13-2 and NPDES Permit, including the Brown & Caldwell Technical Memorandum dated April 13, 2018.
7. Emerald's letters to the Illinois Environmental Protection Agency with whole effluent toxicity test results.
8. Violation Notice No. W-2013-50153 and associated documentation.
9. Violation Notice No. W-2015-50227 and associated documentation.
10. Violation Notice No. W-2019-50007.
11. Block Flow Diagram of Wastestream Sources and WWTF.
12. Affidavit of Galen Hathcock.

# **EXHIBIT 1**

ILLINOIS POLLUTION CONTROL BOARD  
April 16, 2015

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) )

OPINION AND ORDER OF THE BOARD (by J.D. O'Leary):

On September 28, 2012, Emerald Performance Materials, LLC (Emerald) filed a petition requesting that the Board renew an adjusted standard previously granted to its chemical manufacturing facility located at 1550 County Road 1450 N. in Henry, Marshall County (facility). *See* Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122, AS 02-5 (Nov. 4, 2004) (Noveon). Emerald seeks an adjustment from the total ammonia nitrogen as nitrogen standard at Section 304.122(b) of the Board's effluent standards for the discharge from the facility's wastewater treatment plant. *See* 35 Ill. Adm. Code 304.122(b).

On January 14, 2013, the Illinois Environmental Protection Agency (Agency or Illinois EPA or IEPA) recommended that the Board deny the petition. *See* 415 ILCS 5/28.1 (2012); 35 Ill. Adm. Code 104.416. On June 17, 2014, Emerald and the Agency filed agreed recommended conditions to be included in any relief granted by the Board, although the Agency continued to recommend that the Board not grant the requested adjusted standard.

Based on the record before it, the Board finds that Emerald has provided sufficient justification for each of the factors at Section 28.1 of the Environmental Protection Act (Act) (415 ILCS 5/28.1 (2012)). The Board grants Emerald's petition for an adjusted standard from the Board's ammonia effluent limitation subject to conditions listed in its order below.

In this opinion, the Board first provides the procedural background before addressing preliminary matters and the legal framework for an adjusted standard. The Board then summarizes the factual background, previous Board proceedings regarding the facility, and the current applicable standard. After providing Emerald's originally proposed standard, the Board reviews compliance alternatives considered by Emerald. The Board then summarizes the Agency's recommendation to deny the petition. Next, the Board reviews the agreed recommended conditions submitted by Emerald and the Agency. The Board then discusses the issues presented and statutory factors before reaching its conclusion and issuing its order.

**PROCEDURAL BACKGROUND**

On September 28, 2012, Emerald filed a petition for an adjusted standard (Pet.) accompanied by fourteen exhibits:

Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.111, AS02-5 (Nov. 4, 2004) (Exh. 1);

Reissued NPDES [National Pollutant Discharge Elimination System] Permit No. IL0001392 issued February 9, 2007, to Emerald Performance Materials (Exh. 2);

Modified NPDES Permit No. IL0001392 issued to Emerald Performance Materials February 9, 2007, and modified April 27, 2010 (Exh. 3);

Diffuser Performance Evaluation prepared for Noveon, Inc. by AquAeTer (Dec. 2005) (Exh. 4);

Quarterly Mixing Zone Sampling Guidance Manual to Meet NPDES Permit No. IL0001392 Special Condition 18 prepared for Emerald Performance Materials by AquAeTer (April 2007) (Exh. 5);

NPDES Annual Summary Report – NPDES Permit No. IL0001392 submitted by Emerald Performance Materials to Agency and dated December 18, 2006; December 24, 2007; December 22, 2009; January 14, 2010; May 20, 2010; and December 20, 2011 (Exh. 6);

Agency Violation Notice W-2008-00092 to Emerald Performance Materials dated February 29, 2008, and related documents (Exh. 7);

Agency Violation Notice W-2008-00364 to Emerald Performance Materials dated November 20, 2008, and related documents (Exh. 8);

Agency Violation Notice W-2011-30116 to Emerald Performance Materials dated March 31, 2011, and related documents (Exh. 9);

Discharge reports (Exh. 10);

Block flow diagram of wastewater treatment system (Exh. 11);

AquAeTer memorandum regarding “New Ammonia Standards” dated May 10, 2012 (Exh. 12);

Brown and Caldwell letter regarding “Ammonia-Nitrogen Treatment Alternatives for Emerald Performance Materials, LLC – Henry, IL Plant” dated August 27, 2012 (Exh. 13); and

Affidavit of Jarrod Kocin, facility Interim Plant Manager (Exh. 14).

On October 10, 2012, Emerald published notice of filing the petition in the *Henry News Republican*. On October 12, 2012, Emerald filed the certificate of publication of notice. On November 1, 2012, the Board accepted Emerald’s petition for hearing.

On November 8, 2012, the Agency filed a motion for a 60-day extension of the deadline to file a recommendation. In an order dated November 13, 2012, the hearing officer granted the motion and extended the deadline to January 14, 2013.

Through a hearing officer order dated December 17, 2012, the Board submitted questions to Emerald regarding the petition and requested a written response as soon as practicable.

On January 14, 2013, the Agency filed its recommendation (Rec.) that the Board deny Emerald's petition for an adjusted standard.

On April 12, 2013, Emerald filed its responses to the questions in the December 17, 2012 hearing officer order (April Resp.), accompanied by five attachments:

Water Quality Assessment and Waste Assimilative Analysis of the LaGrange Pool, Illinois River (State Water Survey Division, Illinois Department of Energy and Natural Resources June 1981);  
The Effects of Lake Michigan Discretionary Diversion Strategies on Illinois Waterway Dissolved Oxygen Resources (State Water Survey Division, Illinois Department of Energy and Natural Resources July 1983);  
The Impact of Greater Peoria Sanitary District Ammonia Discharges on Illinois River Water Quality (State Water Survey Division, Illinois Department of Energy and Natural Resources November 1984); and  
The Impact of Greater Peoria Sanitary District Ammonia Discharges on Illinois River Water Quality, Part 2 (State Water Survey Division, Illinois Department of Energy and Natural Resources November 1986) (Att. 1);

Appendix B-2 from 303(d) list: Specific Assessment Information for Streams, 2012 (Att. 2);

Ammonia Nitrogen Sampling Results from Illinois River at Diffuser from Annual Summary Reports (Att. 3);

Toxicity test reports (Att. 4); and

Appendices to Diffuser Verification Evaluation (Att. 5).

Through a hearing officer order dated August 1, 2013, the Board submitted to Emerald and the Agency questions regarding the petition, the Agency's recommendation, and Emerald's response to the hearing officer's questions. The order directed Emerald and the Agency to respond by October 8, 2013. On October 8, 2013, the Board received Emerald's response (Oct. Resp.), and on October 9, 2013, the Board received the Agency's response (Agency Resp.).

On June 17, 2014, Emerald and the Agency jointly filed agreed recommended conditions (Joint Rec. Conds.). The parties attached two exhibits to the motion: the text of the Agency's original recommended conditions filed January 14, 2012; and the text of the parties' joint

recommended conditions. The filing also included a request “that the docket from AS 2002-005 be incorporated by reference pursuant to 35 Ill. Adm. Code 101.306” (Mot. Incorpor.). Also on June 17, 2014, Emerald and the Agency filed an agreed motion to modify or rescind the Board order issued on November 1, 2012, which noted Emerald’s request to hold a hearing and authorized the hearing officer to schedule a hearing (Mot. Modify). In the joint motion, Emerald withdrew its request to hold a hearing.

On June 20, 2014, Emerald filed a motion to file *instanter* (Mot. File). Accompanying the motion were two exhibits. The first, a letter dated July 8, 2013, regarding ammonia-nitrogen treatment alternatives, was intended to replace the material originally submitted with Emerald’s petition as Exhibit 13 (Appendix A). The second exhibit provided results of Whole Effluent Toxicity Testing dated November 22, 2013 (Appendix B).

On November 25, 2014, a hearing officer order directed Emerald to address the issue whether PolyOne should become a party to this proceeding. Emerald filed its response on December 2, 2014 (Emerald Resp.).

### **PRELIMINARY MATTERS**

#### **Hearing Officer Order (November 25, 2014)**

In an order on November 25, 2014, the hearing officer noted that the Agency had modified Emerald’s NPDES permit by designating PolyOne as a co-permittee. Pet. at 6-7; *see id.*, Exh. 3. The order also noted that the Agency’s recommendation asserts that “the Board lacks authority to grant the requested relief because the co-permittee, PolyOne, is not a party to this action.” Rec. at 22.

Emerald’s petition states that, “[b]ased 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. . . .” Pet. at 7, n.2. The petition further states that naming PolyOne as a recipient would allow the Agency to “reissue the current NPDES Permit with any relief ultimately granted.” *Id.* The petition adds that “PolyOne has agreed to this and if necessary become a Party to this proceeding.” *Id.* The hearing officer order directed Emerald within 14 days to submit any motion or other filing it deemed appropriate to address this issue.

In its response filed December 2, 2014, Emerald states that it has filed a timely application for renewal of its modified NPDES permit. Emerald Resp. at 1. Emerald reports that the Agency intends to wait for the Board’s decision in this matter before renewing that permit. *Id.*

Emerald states that PolyOne has sold its Henry facility to Mexichem, Inc., which now operates the facility as Mexichem Specialty Resins, Inc. (Mexichem). Emerald Resp. at 1. Emerald states that, since the Agency filed its recommendation, Mexichem sent the Agency a letter requesting “to be removed from the Emerald NPDES permit IL0001392-1 as a co-permittee based on several reasons. . . .” *Id.*, *see* Attachment (letter to IEPA from Mexichem).

The letter reports that these reasons include “1) Mexichem has no operational control, 2) Mexichem has not been involved with current or historical permit applications/renewals, 3) language stated in Special Condition 4 of the current permit regarding PolyOne (Mexichem) streams, and 4) the process descriptions titled A01 and B01 and supporting plot plans and SWPP [stormwater pollution prevention] flows that include the entire site (both companies).” *Id.*; see Pet., Exh. 3 (addressing discharges and monitoring samples from outfalls A01 and B01 in Special Condition 4).

Emerald indicates that its counsel has discussed this case with the Agency, which reports that it “cannot take any action to modify the expired Emerald NPDES Permit in response to the Mexichem letter and will address the Mexichem request when the Emerald NPDES Permit is proposed for issuance following the Pollution Control Board decision in this case.” Emerald Resp. at 1. Emerald states that it “does not believe that any modification to the requested relief is necessary; and the issue concerning the IEPA comment regarding the need to have the additional party added to this proceeding is moot given the pending request by Mexichem to be dropped as a co-permittee.” *Id.*

The Board has reviewed Emerald’s response to the hearing officer order of November 25, 2014, and the attached letter from Mexichem to the Agency. In the absence of a pending motion, the Board takes no action to add a party to this matter and proceeds to consider the petition as a request only by Emerald.

### **Incorporation of Record in AS 02-5**

#### **Summary of Motion**

As noted above under “Procedural Background,” the agreed recommended conditions also includes a request “that the docket from AS 2002-005 be incorporated by reference pursuant to 35 Ill. Adm. Code 101.306.” Joint Rec. Conds. at 4. The request states that “Emerald’s petition presents the same technical treatment alternatives presented in the petition for adjusted standard filed by Emerald in AS 2002-005, on which the Board held a hearing in 2004 and granted relief to Emerald.” *Id.* Emerald and the Agency request that “the docket in AS 2002-05 be incorporated by reference in lieu of a hearing on this matter.” *Id.* at 5.

#### **Board Discussion**

Section 101.306(a) of the Board’s procedural rules<sup>1</sup> provides in pertinent part that,

[u]pon the separate written request of any person or on its own initiative, the Board or hearing officer may incorporate materials from the record of another Board docket into any proceeding. The person seeking incorporation must file with the Board 4 copies of the material to be incorporated. The Board or hearing

---

<sup>1</sup> Since the filing of Emerald’s petition, the Board has amended Section 101.306(a) only to the extent of cross-referencing provisions for electronic filing of documents. See Procedural Rule to Implement Electronic Filing and Allow for Public Remarks at Board Meetings, R 14-21, slip op. at 33 (Jan. 22, 2015).

officer may approve a reduced number of copies for documents incorporated in other Board dockets. The person seeking incorporation must demonstrate to the Board or the hearing officer that the material to be incorporated is authentic, credible, and relevant to the proceeding. Notice of the request must be given to all identified participants or parties by the person seeking incorporation. 35 Ill. Adm. Code 101.306.

Emerald and the Agency have submitted a written request that the Board incorporate the record of AS 02-5, Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122, into the record of this proceeding. The Board notes that, while Section 101.306 of its procedural rules requires the filing of four copies of the material sought to be incorporated, the request did not include copies of the record in AS 02-5. However, Section 101.306 allows the Board to approve a reduced number of copies for documents incorporated in other Board dockets such as AS 02-5. The Board notes that the record in AS 02-5 is on file with the Board's Clerk and is largely available to the participants and the public through the Clerk's Office On-Line (COOL).

The Board also notes the joint request's claim that the Board relied on the record in AS 02-5 to evaluate many of the same technical treatment alternatives and to conduct a hearing and grant the petition. The Board construes this as a claim that the record is "authentic, credible, and relevant to the proceeding." 35 Ill. Adm. Code 101.306(a). In addition, the Board notes that this request is filed jointly by Emerald and the Agency and that the accompanying certificate of service reflects service on persons appearing on the Service List in this proceeding. *See id.*

Having reviewed the request by Emerald and the Agency to incorporate the record in AS 02-5 into the record of this proceeding, and in the absence of any opposition, the Board grants the request. In doing so, the Board under the circumstances of this case allows the incorporation without submitting additional copies of the record in AS 02-5 that is on file with the Board's Clerk. Having granted the joint motion, the Board directs the Clerk to place a copy of the record of the proceeding in AS 02-05 into the record of AS 13-2. *See Citgo Petroleum Corp. and PDV Midwest Refining, L.L.C. v. IEPA*, PCB 08-33, slip op. at 1 (Feb. 21, 2008).

The Board notes that Section 101.306(b) of its procedural rules provides that

"[t]he Board will give the incorporated matter the appropriate weight in light of the following factors: the standard of evidence under which the material was previously presented to the Board; the present purpose for incorporating the material; and the past and current opportunity of cross-examination of the matters asserted within the incorporated material." 35 Ill. Adm. Code 101.306(b).

#### **Agreed Motion to Modify or Rescind**

#### **Summary of Motion**

As noted above under "Procedural Background," on June 17, 2014, Emerald and the Agency filed an agreed motion to modify or rescind Board order. The agreed motion notes that

the Board's November 1, 2012 order accepted Emerald's petition and authorized a hearing in this matter. Mot. Modify at 1 (¶2). The agreed motion states that "Emerald and the Illinois EPA have held extensive discussions regarding the requested relief and have provided information in response to Hearing Officer Orders. As a result the Parties believe that the Board can and should rule on the requested relief based upon the information presented in the pleadings, the responses to the Hearing Officer Orders and the previous record in AS 2005-05 and have reached an agreement to that effect" as presented in agreed recommended conditions. *Id.* (¶3). The agreed motion states that, "[b]ased upon this agreement Emerald withdraws its request that a hearing be held." *Id.* (¶4). Emerald and the Agency request that the Board modify its November 1, 2012 order, decide this matter without a hearing and, in the event that the Board determines to grant the requested adjusted standard, impose the parties' agreed recommended conditions. *Id.* at 1.

### **Board Discussion**

The Board's procedural rules provide that the Board will hold a public hearing on a petition for an adjusted standard if

- 1) The petitioner requests a hearing be held; or
- 2) The Board receives a hearing request by any person pursuant to Section 104.420 of this Part, not later than 21 days after the date of the publication of the petition notice in accordance with Section 104.408 of this Part; or
- 3) The Board *in its discretion determines that a hearing would be advisable.* . . . 35 Ill. Adm. Code 104.422(a).

Emerald's petition requested that the Board hold a hearing in this matter. Pet. at 36. The Board did not receive within 21 days of publication of notice any request to hold a hearing. *See* 35 Ill. Adm. Code 104.422(a)(2). The Board has received no public comment on this case while it has been pending. In its recommendation, the Agency stated that it "does not believe a hearing is necessary. . . ." Rec. at 21.

In Emerald's and the Agency's subsequent agreed motion, Emerald withdraws its request that the Board hold a hearing. Mot. Modify at 1. Section 104.420(b) of the Board's procedural rules provides in its entirety that, "[w]here all parties and participants who have requested a hearing pursuant to this Subpart [D: Adjusted Standards] have withdrawn their requests for a hearing, the hearing will not be held unless the Board in its discretion deems it advisable." 35 Ill. Adm. Code 104.420(b). Emerald has withdrawn the only request to hold a hearing in this matter. Under Section 104.420(b), no hearing will be held, and the Board denies the agreed motion to modify or rescind as unnecessary.

### **Motion to File *Instante***

### **Summary of Motion**

As noted above under “Procedural Background,” on June 20, 2014, Emerald filed a motion to file *instanter*, accompanied by two exhibits.

The motion first notes that Emerald’s petition included an Exhibit 13, a letter dated August 27, 2012, regarding Ammonia-Nitrogen treatment alternatives. Mot. File at 1; *see* Pet., Exh. 13. Attached to the motion as Appendix A is “a revised letter dated July 8, 2013, . . . to replace that which was originally submitted as Exhibit 13.” Mot. File at 1.

The motion next notes that, in its October 8, 2013 response to Board questions, “Emerald stated that it would provide the results of additional Whole Effluent Toxicity Testing to the Board and to the Agency.” Mot. File at 1. Attached to the motion as Appendix B is “a copy of Whole Effluent Toxicity Testing dated November 22, 2013.” *Id.*

The motion states that each of the two documents had previously been provided to the Agency. Mot. File at 1. The motion further states that counsel for Emerald “has been authorized to state that the Agency does not have any objection to this request . . .” *Id.* Emerald requests that the Board grant the motion “and accept the two attached documents into the record of this proceeding for consideration in ruling on the requested relief.” *Id.* at 2.

### **Board Discussion**

The Board’s procedural rules provide that, “[w]ithin 14 days after service of a motion, a party may file a response to the motion. If no response is filed, the party will be deemed to have waived objection to the granting of the motion, but the waiver of objection does not bind the Board . . . in its disposition of the motion. 35 Ill. Adm. Code 101.500(d). The Board notes Emerald’s statement that the Agency does not object to including these two appendices in the record.

Having reviewed the motion and attached exhibits, and in the absence of any objection, the Board grants the unopposed motion for leave to file *instanter* and accepts the two attached appendices into the record of this proceeding.

## **LEGAL FRAMEWORK FOR ADJUSTED STANDARD**

### **Petition and Notice of Filing**

The Act and the Board’s procedural rules provide that a petitioner may request, and the Board may grant, an environmental standard that is different from the generally applicable standard that would otherwise apply to the petitioner. This is called an adjusted standard. The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act and Section 104.Subpart D of the Board’s procedural rules. 415 ILCS 5/28.1 (2012); 35 Ill. Adm. Code 104.400 *et seq.*

The Board’s procedural rules specify the required contents of a petition for an adjusted standard. *See* 35 Ill. Adm. Code 104.406, 104.416. Once a petition for an adjusted standard is filed, the Agency must file its recommendation with the Board. *See* 415 ILCS 5/28.1(d)(3)

(2012); 35 Ill. Adm. Code 104.416. The adjusted standard proceeding is adjudicatory in nature and therefore is not subject to the rulemaking provisions of the Act or the Illinois Administrative Procedure Act (5 ILCS 100/1-1 *et seq.* (2012)). *See* 415 ILCS 5/28.1(a) (2012); 35 Ill. Adm. Code 101.202 (defining “adjudicatory proceeding”).

Section 28.1(d)(1) of the Act (415 ILCS 5/28.1(d)(1) (2012)) and Section 104.408(a) of the Board’s procedural rules (35 Ill. Adm. Code 104.408(a) (quoting the Act)) require the adjusted standard petitioner to publish notice of filing the petition by advertisement in a newspaper of general circulation in the area likely to be affected by the proposed adjusted standard. Under those provisions, publication must take place within 14 days after the petition is filed. The newspaper notice must indicate that any person may cause a public hearing to be held on the proposed adjusted standard by filing a hearing request with the Board within 21 days after publication. *See* 415 ILCS 5/28.1(d)(1) (2012); 35 Ill. Adm. Code 104.408(b).

### **Standard of Review and Burden of Proof**

Emerald seeks an adjusted standard from the rules of general applicability at 35 Ill. Adm. Code 304.122(b), which does not specify the level of justification that must be met by a petitioner for an adjusted standard. Pet. at 12. Therefore, in determining whether to grant the requested adjusted standard, the Board must consider, and Emerald has the burden to prove, the factors at Section 28.1(c) of the Act:

- 1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to the petitioner;
- 2) the existence of those factors justifies an adjusted standard;
- 3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
- 4) the adjusted standard is consistent with any applicable federal law. 415 ILCS 5/28.1(c) (2012); *see* Pet. at 32-33; Rec. at 16.

The burden of proof in an adjusted standard proceeding is on the petitioner. *See* 415 ILCS 5/28.1(b), (c) (2012); 35 Ill. Adm. Code 104.426. Once granted, the adjusted standard, instead of the rule of general applicability, applies to the petitioner. *See* 415 ILCS 5/28.1(a) (2012); 35 Ill. Adm. Code 101.202, 104.400(a). In granting adjusted standards, the Board may impose conditions as may be necessary to accomplish the purposes of the Act. *See* 415 ILCS 5/28.1(a) (2012); 35 Ill. Adm. Code 104.428(a).

In both a general rulemaking and a site-specific rulemaking, “the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be, and the technical feasibility and economic

reasonableness of measuring or reducing the particular type of pollution.” 415 ILCS 5/27(a) (2012). Section 28.1 of the Act requires that the petitioner justify an adjusted standard consistent with Section 27(a) of the Act (415 ILCS 5/27(a), 28.1 (2012)).

## **FACTUAL BACKGROUND**

### **Ownership of Facility**

Emerald reports that “[t]he facility was solely owned and operated by the B.F. Goodrich Company from its initial construction in 1958 until 1993.” Pet. at 13; *see id.* at 1.

Emerald states that the B.F. Goodrich Company divested the Geon Vinyl Division from the company in 1993 and formed The Geon Company, a separate, publicly-held company. Pet. at 1-2, 13. The Geon Company operated the polyvinyl chloride (PVC) resin operations at the facility until August 31, 2000, when it consolidated with the M.A. Hanna Company to form PolyOne. *Id.* at 2, 13. Emerald states that PolyOne “continues to own and operate the PVC resin production plant.” *Id.* at 2, 13.

Emerald states that the B.F. Goodrich Company sold all assets of its chemical business, including the facility, to Noveon in February 2001. Pet. at 2, 13. Emerald adds that, in June of 2004, Noveon completed the sale of a portion of its operations including the facility to The Lubrizol Company. *Id.* Emerald has owned the facility since May 1, 2006. *Id.* The new owner formed Emerald Performance Materials, LLC to own and operate plants including the facility. *Id.*

Emerald states that “[b]oth the PVC resin and specialty chemicals portion of the original B.F. Goodrich plant have remained largely unchanged, despite the history of corporate ownership with only limited curtailment and replacement of individual products.” Pet. at 2.

The petition states that PolyOne and Emerald continue to operate the facility “in basically the same manner as was presented in AS 02-5.” Pet. at 13; *see Noveon*. “The wastewater treatment system is owned and operated by Emerald and the system continues to treat the wastewater” from Emerald’s and PolyOne’s operations at the facility under a service agreement. Pet. at 13. The petition notes that the Agency has modified the facility’s NPDES permit to include PolyOne as a co-permittee. *Id.*; *see id.*, Exh. 3. The petition indicates that Emerald and the Agency have “determined that PolyOne should be included as a named recipient of any relief granted by the Board . . . 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.” *Id.* at 7, n.2.

### **Facility Production**

Emerald states that the facility produces two broad categories of products, accelerators and anti-oxidants. Pet. at 14.

Emerald states that accelerators are used in rubber products such as tires to accelerate the curing process. Pet. at 14. Accelerators have historically been the large majority of the facility's production, and they accounted for 75% of the 2012 output. *Id.* Emerald states that accelerator production at the facility relies almost entirely on mercaptobenzothiazole (MBT) as the key intermediate. *Id.* Emerald adds that MBT-based accelerators are the most common type and are both relatively inexpensive and very efficient. *Id.* Emerald asserts that, "[g]iven the low cost and high value MBT-based accelerators provide customers, it is highly unlikely they will be replaced in the foreseeable future." *Id.* Emerald stresses that it "is the sole remaining manufacturer of MBT in the United States." *Id.* It adds that it is also the sole U.S. producer of the accelerator chemicals Curite 18, OBTS, and MBDS. *Id.* at 14-15. Emerald states that accelerator production involves raw materials including "sulfur, aniline, carbon disulfide, and amines." *Id.* at 15. The multi-step manufacturing process includes "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." *Id.*

Emerald states that anti-oxidants are used to inhibit oxidation in such materials as rubber, jet fuel, greases, oils, and polypropylene. Pet. at 14. The facility manufactures various anti-oxidants, which use "either diphenylamine or one of several phenols as a starting material. The processes consist of both batch and continuous reactors, filtration operations and solidification." *Id.* at 15. Emerald adds that it continues to produce most of the same products that Noveon described to the Board in the proceedings in AS 02-5. *Id.*

PolyOne produces PVC resins, which are sold to customers including those "in the construction, household furnishings, consumer goods, electrical, packaging, and transportation industries." Pet. at 15. "PolyOne uses a small amount of ammonia as an ingredient to produce an emulsifier for use in one of the PVC processes." *Id.* at 16.

Emerald states that "ammonia is not a major raw material in any of the processes" at the facility. Pet. at 16. Because it is not a primary ingredient in any process or product, "the source of ammonia nitrogen in the effluent is not directly related to the level of ammonia in the raw waste water discharged to the treatment plant." *Id.* Amines used in many of the products produced at the facility serve as precursors to formation of ammonia nitrogen. *Id.* at 21-22. Emerald states that "the amines in the wastewater are converted to ammonia nitrogen in the wastewater treatment process and, because nitrification does not occur as a result of inhibition, the ammonia nitrogen is subsequently discharged from the wastewater treatment plant." *Id.* at 16. Brown and Caldwell noted that "most of the effluent ammonia discharge originates as influent organic nitrogen that is bio-hydrolyzed to ammonia during the treatment provided in the onsite wastewater treatment facility." Appendix B at 1. Brown and Caldwell explained that inhibition of nitrification in the wastewater treatment facility is attributable largely to MBT in the wastewater. Pet. at 29; Appendix A at 4-5.

### Wastewater Treatment System

#### Capacity

Emerald states that it owns and operates the facility's wastewater treatment system, which treats wastewater from both PolyOne's and Emerald's processes under a service agreement. Pet. at 13. The system treats approximately 380,000 gallons per day of effluent from the PolyOne operations. *Id.* "Emerald operations contribute approximately 150,000 gallons per day." *Id.* at 13-14. The system also treats approximately 270,000 gallons per day of "combined PolyOne and Emerald utility waters and potential contact stormwater." *Id.* at 14. Total daily discharge of process and non-process water from the facility's wastewater treatment facility is approximately 800,000 gallons. *Id.*

In a hearing officer order, the Board noted Brown and Caldwell's report that effluent NH<sub>3</sub>-N loads had decreased by 48 percent since 2002 due to shutdowns, lower production, and improved recovery. Pet., Exh. 13 at 2; *see* Appendix A at 2, 3 (Table 2). The Board asked whether the reported total discharge is still 800,000 gallons/day. Emerald responded by referring to wasteloads it used to consider compliance alternatives. April Resp. at 3. Emerald stated that the volume of discharged wastewater changed only from an average of 560 gallons per minute (gpm) or 806,000 gallons per day (gpd) in 2002 to 538 gpm or 775,000 gpd for the period of March 2010 to February 2011. *Id.* Emerald added that, for the full year of 2011, "the peak was 738 gpm and the average was 549 gpm. In 2012, the peak was 884 gpm and the average was 596 gpm." *Id.*

#### Processes

Before transfer to the primary treatment system, "[a]ll process wastewater is collected in equalization tanks." Pet. at 17; *see id.*, Exh. 11 (Process Flow Block Diagram). Wastewater from production of accelerators and antioxidants discharges either to the polymer chemical (PC) equalization tank or the Cure-Rite 18® equalization tank. *Id.* at 17. "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." *Id.* The PVC equalization tank at times "may also receive recycle streams from various wastewater treatment processes." *Id.*

"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." Pet. at 18. From those ponds, the wastewater is pumped into the primary treatment system. *Id.*

"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." Pet. at 17; *see id.*, Exh. 11.

From the primary clarifier, "wastewater is sent to activated sludge treatment consisting of up to four 'biotreaters.'" Pet. at 17. Biotreaters are tanks as large as one million gallons that

“contain biomass to degrade the organic matter in the wastewater.” *Id.* Addition of air “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.” *Id.*

After this biological treatment, “wastewater flows into the secondary clarifier where more coagulant and flocculent are added.” Pet. at 17. During secondary clarification, solids removed “are primarily biomass and are returned to the biotreaters.” *Id.*

From the secondary clarifier, wastewater is “sent to a traveling bridge sand filter.” Pet. at 18. A sand bed removes additional solids, “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.” *Id.*

Emerald notes that the City of Henry operates a municipal wastewater treatment system adjacent to the facility. Pet. at 18. The City’s treated discharge combines with the facility’s treated effluent and is then discharged through the facility’s outfall into the Illinois River. *Id.* Compliance sampling of the two waste streams is performed before they are combined. *Id.*

Emerald states that the system has historically provided greater than 95% reduction of biochemical oxygen demand while discharging ammonia nitrogen in concentrations ranging from 23-150 mg/L with the exception of two three-day periods of upsets. Pet. at 16, citing Exh. 10. Brown and Caldwell explained that, although the wastewater treatment plant operates under conditions that would prompt biological nitrification, there is a lack of nitrification resulting from the bio-inhibition of nitrifying bacteria presumably caused by MBT in the wastewater. Pet. at 29; Appendix A at 4-5.

### **Discharge from Treatment Facility**

The treatment facility’s effluent originally discharged through an 18-inch single-port submerged diffuser to the main channel of the Illinois River. Pet. at 19. Emerald states that, because the facility “sits 40 to 50 feet above the Illinois River, the effluent enters the river with great velocity.” *Id.* The original diffuser was replaced in October 2005 with a high-rate multi-port diffuser. *Id.* at 7, 19.

Based on analysis of the facility’s discharge, AquAeTer, a firm providing environmental engineering services, determined that “the dispersion required to meet the acute [ammonia] standard is 11.5:1 and to meet the chronic [ammonia] standard is 68.1:1.” Pet. at 19, citing Exh. 12. AquAeTer’s previous analysis “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.” Pet. at 19; *see* Exh. 12 at 2. Emerald reports that, between January 1, 2007, and January 31, 2012, the facility’s effluent “has had an ammonia concentration ranging from 23 to 150 mg/L with the exception of two three-day periods when the concentration exceeded 155 and reached as high as 180 mg/L of ammonia.” Pet. at 19, citing Exh. 10. However, based on its analysis, “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.” *Id.* at 19-20.

In a hearing officer order, the Board asked Emerald to provide ammonia discharge data in terms of pounds per day and to indicate the average. Emerald responded that NH<sub>3</sub>-N averaged 473 lbs/day from March 2010 to February 2011. April Resp. at 3. “Data from the full year of 2011 indicates that the peak for ammonia was 1449 lbs/day and the average was 579 lbs/day. Data from 2012 indicates that the peak for ammonia was 872 lbs/day and the average was 468 lbs/day.” *Id.*

In addition, the Board noted that the petition in AS 02-5 reported average effluent ammonia of 909 lbs/day and that the NPDES permit establishes a daily maximum load of 1848.6 lbs/day for ammonia (as N). *See* Pet., Exhs. 1, 2. The Board asked whether, in light of decreased effluent loads reported by Brown and Caldwell, the permitted daily maximum load is still necessary. Emerald responded that the maximum daily load for NH<sub>3</sub>-N “can be reduced to 1,500 lbs/day to reflect the progress made by Emerald in reducing effluent ammonia. This accommodates the highest daily load experienced during 2011 of 1449 lbs/day.” April Resp. at 3.

#### **Area Affected by Discharge**

After treatment, wastewater is discharged to the Illinois River through a high rate multi-port diffuser at Outfall 001 under the terms of NPDES Permit No. IL0001392. Pet. at 18; *see* Exh. 2 (permit). The facility is situated on the west bank of the Illinois River between river miles 198 and 199. Pet. at 18. At the facility, the Illinois River is approximately 875 feet wide with an approximate maximum depth of 18 feet. *Id.* at 19. “The average depth of the river is 11 feet, and it has a drainage area of approximately 13,543 square miles at Henry, Illinois.” *Id.* A gauging station operated at Henry since 1981 shows that the Illinois River at that location “has a mean average flow of 15,340 cubic feet per second (cfs).” *Id.* According to the Illinois State Water Survey, the Illinois River at Henry has an annual 7-day, 10-year low flow of 3,400 cfs. *Id.*

#### **Agency Permitting of Facility**

On December 27, 2006, the Agency provided public notice of reissuance of Permit No, IL0001392. Pet. at 6. On February 9, 2007, the Agency issued a revised permit effective from May 1, 2007, to April 30, 2012. *Id.*; *see id.*, Exh. 2. On April 27, 2010, the Agency issued a permit modification designating PolyOne as a co-permittee. Pet. at 6-7; *see id.*, Exh. 3. The petition indicates that Emerald and the Agency have “determined that PolyOne should be included as a named recipient of any relief granted by the Board . . . so that the Agency can reissue the current NPDES permit with any relief ultimately granted.” *Id.* at 7, n.2. The petition adds that “[a] timely renewal of the modified NPDES permit was submitted on November 1, 2011” and remains pending before the Agency.” *Id.* at 7.

**SUMMARY OF PREVIOUS BOARD PROCEEDINGS REGARDING FACILITY**

**PCB 91-17**

Emerald states that, on January 24, 1991, B.F. Goodrich appealed renewed NPDES Permit No. IL0001392 addressing wastewater discharge from the facility. Pet. at 2; *see* Noveon, Inc. f/k/a BF Goodrich Corporation (Henry Facility) v. IEPA, PCB 91-17. The permit issued by the Agency included an ammonia effluent limitation of 3.0 mg/L based on 35 Ill. Adm. Code 304.122(b) that previous permits had not included. Pet. at 2. Emerald reports that, after two days of hearing in that proceeding, “it was agreed that the appropriate course of action would be for B.F. Goodrich to file a variance petition with the Board.” *Id.* at 3. Emerald reports that the parties agreed to stay PCB 91-17 through a series of waivers of the decision deadline with status reports to the Board. *Id.*

After a hearing on February 17, 2004, the Board upheld the Agency’s determination to include an ammonia effluent limit in the NPDES permit for the facility. The Board found that Noveon’s level of treatment did not constitute Best Degree of Treatment (BDT) and that dilution was not therefore allowed. Pet. at 4; *see* Noveon, Inc. f/k/a BF Goodrich Corporation (Henry Facility) v. IEPA, PCB 91-17 (Sept. 16, 2004).

**PCB 92-167**

Emerald states that “[a] variance petition was filed on October 30, 1992 by Noveon which by then had purchased the Henry Plant from B.F. Goodrich. Pet. at 3; *see* Noveon, Inc., f/k/a BF Goodrich Company (Henry Facility) v. IEPA, PCB 92-167; *but see* Pet. at 13 (stating that facility “solely owned and operated by B.F. Goodrich Company” until 1993). Emerald reports that the parties also agreed to stay PCB 92-167. Pet. at 3.

Emerald states that, while these proceedings were pending, there were reviews of ammonia reduction and treatment technologies, studies of facility processes, and meetings with the Agency to review the findings. Pet. at 3. Emerald adds that, based on these efforts, “it was concluded in 1998 that none of the available treatment technologies were both economically reasonable and technically feasible to implement in order to significantly reduce the ammonia in the wastewater from the Henry Plant to a level that would achieve compliance with Section 304.122(b).” *Id.* at 3-4. Because a variance requires eventual compliance with the standard from which relief is sought, “it was agreed that pursuing an adjusted standard from the Board was appropriate. . . .” *Id.* at 4. On June 20, 2002, the Board granted a motion to withdraw the petition for a variance. *Id.*; *see* Noveon, Inc., f/k/a BF Goodrich Company (Henry Facility) v. IEPA, PCB 92-167 (June 20, 2002).

**AS 02-5**

On May 22, 2002, Noveon filed a petition for an adjusted standard. Pet. at 4; *see* Noveon (May 22, 2002). Emerald reports that, while the parties continued to discuss resolution of Agency issues, the parties reported to the Board in January 2003 that neither the pending permit

appeal nor the variance would reach a settlement agreement. Pet. at 4. The Agency filed a recommendation opposing the requested adjusted standard. *Id.*; see Noveon (June 18, 2003).

The Board granted Noveon an adjusted standard from the ammonia effluent limitation in Section 304.122(b). Noveon, slip op. at 21-22 (Nov. 4, 2004); Pet., Exh. 1. The Board provided that the ammonia nitrogen discharge from the facility could not exceed 155 mg/L. Pet. Exh. 1 at 22. Although the Board found that Noveon provided BDT and qualified for a mixing zone and zone of initial dilution (ZID), it directed the Agency designate them “in accordance with Board mixing zone regulations, through the NPDES permitting process.” Pet. at 5; see Noveon, slip op. at 19-21 (Nov. 4, 2004); Exh. 1.

### **Conditions on Grant of Adjusted Standard**

In granting an adjusted standard, the Board imposed a number of conditions. Noveon, slip op. at 22-23 (Nov. 4, 2004); Exh. 1; see Pet. at 6.

**Sunset.** First, the Board provided that “[t]his adjusted standard will expire on November 4, 2011.” Noveon, slip op. at 22 (Nov. 4, 2004). The Board stated that “[t]his period of time will allow Noveon to complete the installation of the multi-port diffuser and perform water quality monitoring and reporting obligations required by this adjusted standard.” *Id.* at 21. The Board added that, after seven years, “more economically reasonable technology may become available and revisiting the ammonia nitrogen issue at that time will be beneficial.” *Id.*

**Ammonia Limit.** The Board provided that “Noveon must not discharge calculated total ammonia nitrogen at concentrations greater than 155 mg/L from its Henry, Illinois plant into the Illinois River.” Noveon, slip op. at 22 (Nov. 4, 2004). The Board did not agree that, “simply because the Agency calculated a theoretical level that is higher than what Noveon actually discharges, Noveon should be permitted to discharge up to that amount.” *Id.* at 21; see *id.* at 9.

**Diffuser.** The Board also adopted a condition providing that “[d]ischarge into the Illinois River shall occur through a high-rate, multi-port diffuser designed to achieve an effluent dispersion necessary to meet the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and zone of initial dilution (ZID). Noveon must install the multi-port diffuser within one year of issuance of its revised NPDES permit.” Noveon, slip op. at 21, 22 (Nov. 4, 2004).

**Quarterly Monitoring.** The Board also added monitoring requirements establishing that “Noveon must monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 Ill. Adm. Code 302.212. The monitoring must commence within 30 days of the installation of the multi-port diffuser and continue until termination of the adjusted standard.” Noveon, slip op. at 22 (Nov. 4, 2004). The Board also required Noveon to submit monitoring results to the Agency in an annual report. *Id.*

**Investigation of Production Methods and Treatment Technologies.** The Board also adopted a condition requiring Noveon to “continue to investigate production methods and

technologies that generate less ammonia in Noveon's discharge into the Illinois River. When practicable, Noveon must substitute current methods or technologies with new ones so long as the substitution generates less ammonia in Noveon's discharge." Noveon, slip op. at 22 (Nov. 4, 2004). The condition also provided that "Noveon must 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 concentrations in the discharge from Noveon's facility" which the Agency specifically requests in writing that it perform. *Id.* In response to a Board question, Emerald reported that the Agency has not made any request for such a test. April Resp. at 7. The Board also required that "Noveon must prepare and submit each year an annual report summarizing the activities and results of these investigatory efforts." Pet. at 22-23.

**Compliance.** The Board also adopted a condition requiring that "Noveon must operate in full compliance with the Clean Water Act, its National Pollutant Discharge Elimination System program, the Board's water pollution regulations, and any other applicable regulation." Noveon, slip op. at 23 (Nov. 4, 2004).

#### **Attempts to Achieve Compliance with Conditions**

**Diffuser.** Emerald states that, on October 4, 2005, it completed installation of the multi-port diffuser at a cost of more than \$1.3 million. Pet. at 7, 12. Emerald notes that the Board had required installation within one year after issuance of a revised NPDES permit, or by February 9, 2008. *Id.* Emerald states that AquAeTer completed a dispersion study of the diffuser on October 25, 2005, and submitted a report to the Agency on December 21, 2005. Pet. at 7, 12; *see id.*, Exh. 4 ("Diffuser Performance Evaluation"). "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." *Id.* at 7, 12. Emerald asserts that the results demonstrate 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." *Id.* at 7. Emerald states that the Agency granted a ZID and mixing zone reflected in the 2007 reissued NPDES permit. *Id.* at 7, 12; *see id.*, Exh. 2.

**Quarterly Monitoring.** Emerald reports that AquAeTer and the Agency agreed to a program for monitoring ammonia concentrations as required by the Board's Order in AS02-5. Pet. at 7-8; *see Noveon*, slip op. at 22 (Nov. 4, 2004). AquAeTer subsequently prepared a monitoring plan that 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." Pet. at 8; *see id.*, Exh. 5.

**Discharge Monitoring Report (DMR).** Emerald states that it has compiled monitoring results for ammonia nitrogen as N, biological oxygen demand (BOD), total suspended solids (TSS), flow, pH, and temperature. Pet. at 9-10; *see id.*, Exh. 10. Emerald reports that it has submitted these results to the Agency monthly from January 1, 2001 through January 31, 2012. *Id.* Emerald states that these data show 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.” Pet. at 10. Emerald further states that, “[e]ven with these higher concentration numbers, the NPDES permit daily maximum ammonia load limit of 1,848.6 pounds per day was not exceeded.” *Id.*

**Effluent Toxicity Testing.** Emerald states that it has conducted effluent toxicity testing and reported results to the Agency as required by its permit. Pet. at 10. Emerald states that, “[a]t 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 an LC<sub>50</sub> of 2.51 percent by volume.” *Id.* Emerald asserts that, “[b]ecause all of the acute toxicity testing results to date have been [] above this value, Emerald is meeting their toxicity limit for LC<sub>50</sub> of greater than or equal to 2.51 percent by volume.” *Id.*

In a hearing officer order, the Board noted that Emerald had provided its procedure for conducting toxicity testing but had not submitted results with its petition. *See* Pet. at 10; Pet., Exh. 2 at 7. In response, Emerald submitted reports of toxicity testing performed in 2006. A 96-hour acute test, which is performed on *Pimephales promelas* (fathead minnow), showed an estimated LC<sub>50</sub> value of 7.4% effluent with 95% confidence limit of 5.9 – 9.2%. A 48-hour acute test, which is performed on *Ceriodaphnia dubia* (water flea), showed an estimated LC<sub>50</sub> value of 16.0% effluent. April Resp. at 15, citing Att. 4. Emerald concurred that the corresponding dilution ratio is 6.25:1. Oct. Resp. at 4.

Emerald also submitted results of toxicity testing performed in 2011 and 2012. Emerald stated that the biomonitoring required by Special Condition 14 of its NPDES permit was performed on effluent from the facility and not on the combined discharge with the City Of Henry’s publicly-owned treatment works (POTW). Oct. Resp. at 3; *see* Pet., Exh. 2 at 7. On June 13, 2011, a 96-hour acute test showed an estimated LC<sub>50</sub> value of 8.5% effluent, and a 48-hour acute test showed an estimated LC<sub>50</sub> value of 11.27% effluent. April Resp. at 15, citing Att. 4. Emerald concurred that the corresponding dilution ratio is 11.8:1. Oct. Resp. at 4. Emerald reported that, because of a problem with the sample collected July 25, 2011, the laboratory was able to perform only a 48-hour test on the *Pimephales promelas*, which showed an estimated LC<sub>50</sub> value of 8.68% effluent. The 48-hour acute test on *Ceriodaphnia dubia* showed an estimated LC<sub>50</sub> value of 12.5% effluent. April Resp. at 15, citing Att. 4. Emerald concurred that the corresponding dilution ratio is 11.5:1. Oct. Resp. at 4. On October 12, 2011, the 96-hour test showed an estimated LC<sub>50</sub> value of 22.75% effluent, and a 48-hour acute test showed an estimated LC<sub>50</sub> value of 31.8% effluent. April Resp. at 15, citing Att. 4. Emerald concurred that the corresponding dilution ratio is 4.4:1. Oct. Resp. at 4. Emerald reported that, because of a failure to deliver renewal effluent, a sample collected on January 23, 2012, allowed only a 48-hour test on *Pimephales promelas*, which showed an estimated LC<sub>50</sub> value of <6.25% effluent. The 48-hour acute test on *Ceriodaphnia dubia* showed an estimated LC<sub>50</sub> value of 9.42% effluent. April Resp. at 15, citing Att. 4; *see* Oct. Resp. at 1. Emerald concurred that the corresponding dilution ratio is >16.0:1. Oct. Resp. at 4. Emerald stated that each of these dilution ratios is less than the dilution achieved at the edge of the ZID, which is 39.8:1 at 20 feet and 47.9:1 at 92 feet. Oct. Resp. at 4. Emerald added that the dispersion ratio required to meet the acute ammonia standard is also met at the edge of the ZID. *Id.* at 4-5.

Emerald responded to a Board question regarding the January 23, 2012 sample showing an LC<sub>50</sub> value of <6.25% and the assertion by the Agency that “LC<sub>50</sub> values this toxic are not found at any other Illinois facility.” Rec. at 19. Emerald explained that a failure in sampling and analysis results in a “less than” designation and that it had submitted the results of new Whole Effluent Toxicity Testing performed on samples collected in November 2013. A 96-hour acute test on *Pimephales promelas* showed an estimated LC<sub>50</sub> value of 16.79% effluent, and a 48-hour acute test on *Ceriodaphnia dubia* showed an estimated LC<sub>50</sub> value of 16.49% effluent. Appendix B at 1, 6, 7, 16, 19.

In a hearing officer order, the Board noted that dispersion required to meet the ammonia standards was calculated based on a combined discharge with concentration of 126 mg/L but the WET testing produced LC<sub>50</sub> results based only on the Emerald/PolyOne effluent. The Board asked Emerald to explain the practical effect of comparing these results. Specifically, the Board asked whether the river would see “effluent with the LC<sub>50</sub> values reported for Emerald/PolyOne or rather would it likely see relatively higher LC<sub>50</sub> values if the combined effluent underwent WET testing?” Emerald stated that “the dilution ratios from the LC<sub>50</sub> effluent results are potentially greater than the LC<sub>50</sub> percent effluent results would be” from the combined effluent. Oct. Resp. at 5. Emerald explained that “the dilution ratios presented in the WET testing results are the maximum expected values for the end of pipe discharge if the Henry dilutional flow was not being discharged. The river actually receives a less toxic (LC<sub>50</sub> would be larger/dilution ratio would be smaller) combined effluent from the Emerald/PolyOne plus City of Henry POTW that flows through the diffuser to the River.” *Id.*

The Board also noted that the NPDES permit for the facility provides that, “[s]hould the results of the biomonitoring program identify toxicity, the IEPA may require that the Permittee prepare a plan for toxicity reduction evaluation and identification.” Pet., Exh. 2 at 7 (Special Condition 14(4)). Emerald reports that the Agency “has not requested a plan for toxicity reduction evaluation and identification and test results to date indicate that Emerald has been in compliance with the Permit requirement of no toxicity at or less than 2.51%.” April Resp. at 15. The Board requested that Emerald explain the basis for this toxicity limit. Emerald stated that “[t]he dispersion achieved in the ZID is 39.8:1. This means 1 part effluent to 38.8 parts background river water at the edge of the ZID. The effluent is 1/39.8 percent of the water at the edge of the ZID, which is 2.51%. Therefore, an effluent with an LC<sub>50</sub> of greater than 2.51% should not be toxic at the edge of the ZID.” April Resp. at 15; *see* Oct. Resp. at 3-4.

### **Environmental Projects**

The opinion granting an adjusted standard in AS 02-5 stated that, “[t]hroughout the duration of this adjusted standard, the Board encourages Noveon to research and propose means, beyond the wastewater treatment plant and multi-port diffuser, of providing environmentally beneficial improvements to the Illinois River in Marshall County.” Noveon, slip op. at 19 (Nov. 4, 2004). The Board elaborated that “[a]ny project that Noveon researches and proposes must improve, restore or protect the Illinois River in Marshall County and reduce risks to public health and the environment beyond what is ordered by this adjusted standard.” *Id.* The Board noted that it had incorporated projects of this nature into adjusted standards. *Id.* (citations omitted). Although the Board did not make research into such improvements an element of its order, it

stated that “the Board will consider proposals by Noveon should Noveon choose to renew this adjusted standard at a future date.” *Id.*

In a hearing officer order, the Board noted that Emerald had sought renewal of the adjusted standard and requested information on any projects Emerald had identified or planned to propose. Emerald responded that it “has not yet completed any projects specifically targeted to provide environmentally beneficial improvements to the Illinois River.” April Resp. at 8. Emerald added that it does not now plan any specific projects of this nature. *Id.* at 9. Emerald reported that funds for such projects have been limited by repayment of debt stemming from its purchase of the facility and the cost of installing a sodium hydrosulfide (NaSH) unit. *Id.* at 8-9. Emerald also cited the effect of a seven-month lockout of the hourly workforce and the impact of the recent recession. *Id.* at 9. Emerald stated that is “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.” *Id.*

The Board also asked Emerald if it “would consider cost-share incentives to implement or install best management practices (BMP) 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 on the Agency’s website. Oct. Resp. at 11. Emerald responded that it was not likely to consider such options “due to the effort and resources needed to manage such a project, [and] the lack of identified BMPs for the reduction of non-point sources of nitrogen.” *Id.* Emerald asserts that “identifying new treatment technologies and/or production methods would be a more effective use of monies.” *Id.* Emerald added that it “had not yet “identified any BMPs that would be economically feasible or result in a quantifiable environmental benefit.” *Id.*

### **Annual Reports**

Emerald states that it has prepared and submitted to the Agency required annual reports of ammonia nitrogen monitoring. Pet. at 8; *see id.*, Exh. 6; *see also* Noveon, slip op. at 22-23 (Nov. 4, 2004).

Emerald adds that these reports also include “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.” Pet. at 8; *see id.*, Exh. 6. Below under “Discussion,” the Board separately reviews Emerald’s reports on these projects.

**2006.** On December 18, 2006, Emerald submitted its 2006 annual report. Exh. 6 at 1; *see* Rec. at 5-6. Emerald reported that it had installed a multi-port diffuser, performed a dispersion study, and issued a report on its efficacy. *Id.* Emerald also reported that it had submitted monthly DMRs to the Agency with results of ammonia monitoring conducted five times per week. *Id.*

**2007.** On December 24, 2007, Emerald submitted its 2007 annual report. Exh. 6 at 2-3. Emerald reported two results of quarterly monitoring for ammonia nitrogen: sampling on March 28, 2007, showed a concentration of 0.23 mg/L and on September 28, 2007, showed a

concentration of 0.20 mg/L. *Id.* at 2. Emerald again reported that it had submitted monthly DMRs to the Agency with results of ammonia monitoring conducted five times per week. *Id.*

**2008.** On March 20, 2010, Emerald submitted its 2008 annual report. Exh. 6 at 4. Emerald reported four results of quarterly monitoring for ammonia nitrogen: sampling on March 14, 2008, showed a concentration of 0.27 mg/L; on June 19, 2008, showed a concentration of <0.10 mg/L; on September 28, 2008, showed a concentration of <0.20 mg/L; and on December 13, 2008, showed a concentration of <0.20 mg/L. *Id.* Emerald again reported that it had submitted monthly DMRs to the Agency with results of ammonia monitoring conducted five times per week. *Id.*

**2009.** On December 22, 2009, Emerald submitted its 2009 annual report. Exh. 6 at 5-6; *see* Rec. at 7. Emerald reported four results of quarterly monitoring for ammonia nitrogen: sampling on March 26, 2009, showed a concentration of <0.20 mg/L; on June 18, 2009, showed a concentration of <0.20 mg/L; on September 28, 2009, showed a concentration of <0.10 mg/L; and on November 20, 2009, showed a concentration of <0.20 mg/L. *Id.* at 5. Emerald again reported that it had submitted monthly DMRs to the Agency with results of ammonia monitoring conducted five times per week. *Id.*

**2010.** On January 14, 2011, Emerald submitted its 2010 annual report. Exh. 6 at 7-8; *see* Rec. at 7-8. Emerald reported three results of quarterly monitoring for ammonia nitrogen: sampling on March 31, 2010, showed a concentration of <0.20 mg/L; on June 30, 2010, showed a concentration of <0.20 mg/L; and on September 23, 2010, showed a concentration of <0.20 mg/L. Exh. 6 at 7. Emerald again reported that it had submitted monthly DMRs to the Agency with results of ammonia monitoring conducted five times per week. *Id.*

**2011.** On December 20, 2011, Emerald submitted its 2011 annual report. Exh. 6 at 9. Emerald reported four results of quarterly monitoring for ammonia nitrogen, each of which showed a concentration of <0.10 mg/L. *Id.*

### **Violation Notices**

Emerald states that, while it “has operated the wastewater treatment facility 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” through a DMR. Pet. at 8. Emerald adds that the Agency has issued a Violation Notice (VN) three times since issuance of the facility’s permit in 2007. *Id.* at 8-9.

**Violation Notice W-2008-00092.** Emerald states that the Agency issued this VN on February 29, 2008, regarding TSS effluent exceedances in October and December 2007 and BOD and TSS effluent exceedances in January 2008.” Pet. at 9; *see id.*, Exh. 7. Emerald asserts that, after meeting with the Agency, it provided “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.” *Id.* at 9. Emerald reports that the Agency accepted a Compliance Commitment Agreement (CCA) on June 12, 2008. *Id.*; *see id.*, Exh. 7.

**Violation Notice W-2008-00364.** Emerald states that the Agency issued this VN on November 20, 2008, regarding Methylene Chloride effluent limit exceedances. Pet. at 9; *see id.*, Exh. 8. Emerald asserts that, after meeting with the Agency, it responded by “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 results in a discharge of process water that caused the July exceedance.” *Id.* at 9. Emerald reports that the Agency approved a CCA on March 10, 2009. *Id.*; *see id.*, Exh. 8.

**Violation Notice W-2011-30116.** Emerald states that the Agency issued this VN on March 31, 2011, regarding TSS effluent exceedances in November and December 2010 and January 2011. Pet. at 9; *see id.*, Exh. 9. Emerald asserts that it “submitted a response describing the problems with the solids removal processes and the steps it had taken which results in compliance.” *Id.* Emerald reports that the Agency accepted a CCA on June 20, 2011. *Id.*; *see id.*, Exh. 9.

### **CURRENT GENERALLY APPLICABLE STANDARDS**

Section 301.345 of the Board’s water pollution regulations provides in its entirety that

‘Population Equivalent’ is a term used to evaluate the impact of industrial or other waste on a treatment works or stream. One population equivalent is 100 gallons (380 l) of sewage per day, containing 0.17 pounds (77 g) of BOD<sub>5</sub> (five day biochemical oxygen demand) and 0.20 pounds (91 g) of suspended solids. The impact on a treatment works is evaluated as the equivalent of the highest of the three parameters. Impact on a stream is the higher of the BOD<sub>5</sub> and suspended solids parameters. 35 Ill. Adm. Code 301.345.

Section 304.122 of the Board’s effluent standards provides in its entirety that

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

- c) In addition to the effluent standards set forth in subsections (a) and (b) of this Section, all sources are subject to Section 304.105. 35 Ill. Adm. Code 304.122; *see* Pet. at 11.

Emerald states that the Board's Rule 406, adopted on January 6, 1972, addressed discharges of ammonia nitrogen to the Illinois River and is now codified as Section 304.122. Pet. at 11. Emerald argues that "[t]he 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." *Id.*; *see id.* at 32. Emerald argues, however, that a later study attributed low DO levels not to larger dischargers but primarily to sediment oxygen demand. *Id.* at 32.

In a hearing officer order, the Board asked Emerald to provide more information on the study regarding the cause of low DO concentrations. Emerald cited a report prepared for the Illinois Department of Energy and Natural Resources. The report stated that significantly reducing ammonia nitrogen loads from the Joliet and Metropolitan Sanitary District of Greater Chicago sewage treatment plants upstream from river mile 273, near the junction of the Des Plaines and Kankakee Rivers, was necessary to improve downstream DO levels to river mile 179. Thomas A. Butts, *et al.*, THE IMPACT OF GREATER PEORIA SANITARY DISTRICT AMMONIA DISCHARGES ON ILLINOIS RIVER WATER QUALITY (State Water Survey Division, Illinois Department of Energy and Natural Resources November 1985) at 4. Emerald discharges near river mile 198. Apr. Resp. at 1. One study showed that, during 7-day 10-year low flows, 13 percent of downstream oxygen demand was attributable to oxidation of ammonia nitrogen, while 30 percent was attributable to sediment oxygen demand and 57 percent due to carbonaceous BOD (CBOD). Thomas Butts, *et al.*, WATER QUALITY ASSESSMENT AND WASTE ASSIMILATIVE ANALYSIS OF THE LAGRANGE POOL, ILLINOIS RIVER (State Water Survey Division, Illinois Institute of Natural Resources June 1981) at 105; April Resp. at 1.

In addition, Emerald stated that the United States Geological Survey reports DO concentrations upstream and downstream from the facility that meet the 5 mg/L standard. April Resp. at 1. Emerald added that "AquAeTer has also modeled these reaches of the Illinois River at low flow, high temperature conditions and the Illinois River meets the DO standard during critical conditions." *Id.*

#### **EMERALD'S ORIGINALLY PROPOSED ADJUSTED STANDARD**

In its petition, Emerald proposed that the Board adopt the following 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. Pet. at 31-32; *see* 35 Ill. Adm. Code 104.406(f).

### **EFFORTS TO ACHIEVE COMPLIANCE AND ALTERNATIVES**

Emerald states that Noveon and its consultant, Brown and Caldwell, examined a variety of methods for reducing levels of ammonia nitrogen in the facility's wastewater treatment plant effluent. Pet. at 20. Emerald adds that Brown and Caldwell determined in AS 02-5 "that there were no economically feasible treatment alternatives that would reliably reduce the effluent ammonia nitrogen concentrations low enough to comply with applicable requirements. . . ." *Id.* Emerald states that it hired Brown and Caldwell to review this conclusion and weigh any changes since the Board decided AS 02-5 that may change that conclusion. *Id.*; *see* Appendix A (replacing Exhibit 13).

Emerald first summarizes information submitted to the Board in AS 02-5. Emerald states that the facility evaluated the existing wastewater treatment system's "ability to nitrify, or oxidize, ammonia to nitrates through single-stage biological nitrification" in the 1980s. Pet. at 21. That evaluation concluded that "single-stage biological nitrification was not achievable in the existing activated sludge system." *Id.* The Agency requested a more extensive study of the issue, which was completed in December 1995 and submitted to the Agency. *Id.* Emerald states that this treatability study conclusively demonstrated that the facility "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." *Id.* Emerald adds that "[t]he 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." *Id.* Emerald explains that the inability of the facility's system "to nitrify was due to inhibition of nitrifying bacteria by the fundamental constituents in the wastewater." *Id.*

Emerald states that, based on this determination that the facility's system could not nitrify, Noveon investigated other alternatives for control and reduction of ammonia nitrogen in the discharge: in-process reductions, wastewater pretreatment, and post-treatment of wastewater. Pet. at 21. In the following subsections of the opinion, the Board reviews these investigations and the Agency's position on Emerald's reports and conclusions.

#### **In-Process Reductions**

Emerald states that Noveon had examined whether the facility "could eliminate the use of amines in its various processes or whether it could recover and/or recycle the precursors to ammonia for reuse in the system." Pet. at 21-22. Emerald asserts that Noveon rejected these methods as feasible alternatives because amines are essential elements of many products produced at the facility. *Id.* at 22. Noveon also rejected the recycling option because recycled

material was inferior and could not guarantee production that would maintain product quality. *Id.* Emerald added that “the waste material generated in the recycling process would likely be classified as a hazardous waste,” raising issues regarding cross-media impact. *Id.* Emerald clarified that “[e]xcess amines are, however, currently recovered from processes where recovery methods provide usable quality materials and are not cost prohibitive.” *Id.*

In its recommendation, the Agency states that Emerald has not provided information on the process of recovering excess amines. Rec. at 10. The Agency also states that Emerald has not provided information on recovery costs that it considers prohibitive. *Id.* The Agency concludes that it “is not in a position to analyze Emerald’s ability to have in-process reductions with the information provided.” *Id.*

#### **Pretreatment of Wastestream**

Emerald states that this option involves removal of certain constituents from wastewater before treatment. Pet. at 22. Emerald states that alternatives including morpholine recovery, tert-butyl alcohol recovery, and a liquid extraction process did not “achieve reduction that would result in compliance” with Section 304.122(b). *Id.* Emerald adds that “[t]he pretreatment options also raised various technical issues including plant personnel safety issues.” *Id.*

In its recommendation, the Agency states that Emerald has not explained why these options will not result in compliance with the generally applicable standard. Rec. at 10. The Agency argues “that Emerald should still provide incremental reductions in ammonia even though it would fail to meet the prescribed 3 mg/L limit.” *Id.*, citing 35 Ill. Adm. Code 304.122.

#### **Post-Treatment of Wastestream**

Emerald states that, after concluding that the facility could not comply through single-stage nitrification, in-process reductions, or pretreatment, Brown and Caldwell evaluated post-treatment alternatives for reduction of ammonia nitrogen in the effluent. Pet. at 22-23. The Board addresses these alternatives in the following subsections of the opinion.

#### **2013 Re-Evaluation**

In its July 8, 2013 consideration of treatment alternatives, Brown and Caldwell noted a number of changes in the facility’s operation of the wastewater treatment system since 2002. Appendix A at 4; *see* Pet. at 28. First, the facility had instituted the addition of carbon dioxide and sulfuric acid to the polymer chemicals (PC) tank after previous use of acid alone. Appendix A at 4. Second, Brown and Caldwell noted that the facility had begun adding only synthetic flocculent during primary treatment, where it had previously added ferric chloride and anionic flocculent. *Id.* Third, the facility had begun to add synthetic flocculent and synthetic coagulant during secondary treatment, where it had previously added alum and anionic flocculent. *Id.* Finally, Brown and Caldwell noted that the facility operated its west and north biotreaters after it had also operated its east and center biotreaters. *Id.* This change reduced biotreater volume from 1.9 million gallons to 1.3 million gallons. *Id.*

Brown and Caldwell stated that “[t]hese changes appear not to have caused any appreciable change in effluent quality. . . .” Appendix A at 4; *see* Pet. at 29. Their report states that “[t]he lack of nitrification continues to be due to inhibition of nitrifying bacteria. . . . This inhibition has been largely attributed to the presence of mercaptobenzothiazole in the wastewater. This compound is the building block for the products made at the Emerald plant and has a published nitrification threshold of less than 3 mg/L.” Appendix A at 4 (citation omitted). Brown and Caldwell concluded that this inhibition and the nature of the facility’s wastewater cause treatment alternatives to be unreliable. *Id.*

The July 8, 2013 report re-examined a number of previously-considered alternatives. Pet. at 29. Three of those 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.” Appendix A at 5; *see* Pet. at 29. Below, the Board reviews the record on the alternatives originally considered by Brown and Caldwell and, where applicable, the 2013 re-evaluation of those alternatives.

### **Alkaline Air Stripping**

Emerald states that ammonia nitrogen exists in aqueous and gaseous forms and that, as pH increases, the aqueous form becomes a gas. Pet. at 23. Emerald adds that, “by increasing the pH of a wastewater stream it is possible to strip or remove the ammonia gas.” *Id.* Emerald considered this option at three points in the system: “1) within the PC tank; 2) within the PVC tank and 3) after the secondary clarifier discharge.” *Id.*; *see* Appendix B at 2 (block flow diagram).

Emerald noted that, “[b]ecause 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.” Pet. at 23. Accordingly, Emerald chose diffused air stripping and surface aeration processes for evaluation of the PC and PVC tanks. *Id.* Emerald considered this alternative only for its existing tanks. Emerald based this consideration in part on “the slow rate of these stripping processes, the small amount of ammonia available in these tanks, and the large flow rates of wastewater into the PC tank and PVC tank.” *Id.* at 23-24. Also, Emerald argued that new equipment would have added little benefit because most of the ammonia nitrogen discharged from the facility is generated in the wastewater treatment facility. *Id.* at 24.

Emerald reviewed conventional packed tower air stripping of the wastewater treatment facility effluent downstream of the secondary clarifier “because this is a well-established stripping technology.” Pet. at 24.

Emerald reported that air stripping test results showed some ammonia reduction in wastewaters from the PC tank, PVC tank, and secondary clarified wastewater. Pet. at 24. With surface aeration stripping, treatment of the PC tank and PVC tank wastewater achieved less than 20% combined ammonia removal. *Id.* Emerald stated that these reductions were not sufficient to meet the generally applicable effluent limitation. *Id.* In addition, Emerald noted “the present worth costs (capital, operation and maintenance) in 2004 of \$2.3 million for PC tank treatment

and \$14.1 million for PVC tank treatment.” *Id.* Emerald characterized these alternatives as “economically unreasonable in light of the high costs and low ammonia reduction obtained.” *Id.*

In its recommendation, the Agency notes that “[t]he costs of these treatment options are by far the highest in all the alternatives Emerald evaluates.” Rec. at 11. The Agency adds that the cost per pound of ammonia nitrogen removal is nearly three times as expensive as the next less expensive option. *Id.*, citing Exh. 13, Att. C (cost analysis).

Emerald also reported that packed tower air stripping at the secondary clarifier resulted in ammonia removal of greater than 95 percent. Pet. at 24. Emerald noted, however, that this alternative increased TDS by more than 20%, “which could lead to aquatic toxicity of the effluent.” *Id.* Emerald added that total installation, operation, and maintenance of additional equipment for this alternative had a present worth cost of \$14 million in 2004. *Id.* at 24-25. Emerald claimed that these costs caused this alternative to be “economically unreasonable.” *Id.* at 24.

In its recommendation, the Agency noted Brown and Caldwell’s estimated capital costs for this alternative of \$9.4 million including off-gas ammonia controls and annual O/M costs of \$1.94 million. Rec. at 11, citing Pet., Exh. 13, Att. C. The Agency stated that the cost of ammonia nitrogen removed under this alternative is \$20.47 per pound during the first ten years and approximately \$13.58 per pound after the first ten years. Rec. at 11, citing Pet., Exh. 13, Att. C. Although the Agency notes Emerald’s argument that this alternative will cause fouling and an increase in TDS, “[t]he Agency believes the fouling issue can be solved by use of filtration prior to the air stripper.” Rec. at 11.

In addition, the Agency’s recommendation argues that Emerald’s capital cost estimate for this alternative includes treatment of off-gas emissions without providing support that the controls would be required by state or federal law. Rec. at 11-12. The Agency further argues that, without off-gas treatment, the capital cost to achieve 95% reduction falls to \$4.7 million with annual O/M costs of \$1.76 million. *Id.* at 11, citing Pet., Exh. 13, Att. C. For this alternative, the Agency stated that the cost of ammonia nitrogen removed would be \$15.45 per pound during the first ten years and \$12.37 per pound after the first ten years. Rec. at 11-12, citing Pet., Exh. 13, Att. C.

In its July 8, 2013 re-evaluation, Brown and Caldwell determined “conceptual level comparative capital costs” for these three stripping alternatives, which it “considered accurate to within  $\pm$  50 percent.” Appendix A at 6. For Option 1, stripping of PC tank contents, estimated capital costs were \$1.5 million. *Id.* at 7. For Option 2, stripping of PVC tank contents, estimated capital costs were \$430,000. *Id.* For Option 3, stripping of the secondary clarifier effluent, estimated capital costs were \$9.4 million. *Id.*

Brown and Caldwell also determined “conceptual level operations and maintenance [O/M] costs,” which it also considered “accurate to within  $\pm$  50 percent.” Appendix A at 7. For Option 1, annual estimated O/M costs were \$536,000. *Id.* For Option 2, annual estimated O/M costs were \$3,643,000, and for Option 3, annual estimated O/M costs were \$1,942,000. *Id.*

Brown and Caldwell also established total annual costs and ammonia removal for these alternatives. Appendix A at 8. Capital costs are based on a ten-year period, an annual interest rate of 3.5%, and no salvage value. *Id.* O/M costs are based on a ten-year period and an inflation rate of 3.0%. *Id.* For Option 1, total annual costs are \$580,000 with an ammonia removal cost of \$227 per pound. *Id.* For Option 2, total annual costs are \$4,228,000 with an ammonia removal cost of \$55 per pound. *Id.* For Option 3, total annual costs are \$3,357,000 with an ammonia removal cost of \$20 per pound. *Id.*

Brown and Caldwell's re-evaluation also addressed the reliability of these options. The report states that a reliability rating is "based on a relative assessment of mechanical and process performance reliability to achieve the average percent removal (10 being highest reliability). Reliability means the ability of the treatment process to achieve the predicted effluent ammonia nitrogen (NH<sub>3</sub>-N) concentrations on a routine basis." Appendix B, Att. D at 1-2. For Option 1, Brown and Caldwell provided a Reliability Rating of 8 and commented that "[p]erformance will vary as volatile amine content varies in wastewater." *Id.* at 1. The report also noted that this alternative will increase effluent TDS. *Id.* For Option 2, the report provided a Reliability Rating of 7 and commented that this alternative is "[s]imple to operate" but "[w]ill increase effluent TDS." *Id.* For Option 3, the report provided a Reliability Rating of 7 and commented that this alternative is "[c]omplex to operate" and "[w]ill increase effluent TDS." *Id.*

### **Struvite Precipitation**

Emerald states that this alternative precipitates struvite (NH<sub>4</sub>MgPO<sub>4</sub>6H<sub>2</sub>O) from the facility's combined wastewater. Pet. at 25; *see* Appendix B at 3 (block flow diagram). Emerald reported 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 costs of \$5.1 million in 2004." Pet. at 25. Emerald also noted that this option would also increase TDS in the effluent. *Id.*; *see* Appendix D at 2.

In its recommendation, the Agency noted that this 24% reduction could be obtained with a capital cost of \$296,315 and annual O/M costs of \$1.43 million. Rec. at 12, citing Pet., Exh. 13, Att. C. The Agency further noted that, broken down over a ten-year period, the cost of ammonia nitrogen removed would be approximately \$52.25 per pound. Rec. at 12, citing Pet., Exh. 13, Att. C.

In its July 8, 2013 re-evaluation, Brown and Caldwell determined conceptual level comparative capital costs of \$300,000, conceptual level O/M costs of \$1.433 million, and total annual costs of \$1,678,000 with ammonia removal costs of \$52 per pound for this alternative. Appendix A at 7-8. Brown and Caldwell's re-evaluation provided a Reliability Rating of 6. Comments noted that the system is "[s]imple to operate," but added that "the precipitant is prone to foul pumps and piping." Appendix D at 1.

### **Effluent Breakpoint Chlorination**

Emerald stated that “[t]his 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.” Pet. at 25; *see* Appendix B at 4 (block flow diagram). Emerald stated that, although this alternative could meet the generally applicable ammonia standard, it “is prohibitively expensive, at a present worth cost of \$9.7 million in 2004.” Pet. at 25. Emerald noted that this alternative also would “dramatically increase effluent TDS and may result in the formation of chlorinated organics in the effluent.” *Id.* at 25-26.

In its recommendation, the Agency stresses that this alternative would reduce ammonia nitrogen in the effluent by 98% with capital costs of \$1.4 million and annual O/M costs of \$1.7 million. Rec. at 12, citing Pet., Exh. 13, Att. C. The Agency states that this represents costs of approximately \$12.48 per pound of ammonia nitrogen removed. Rec. at 12, citing Pet., Exh. 13, Att. C. While the Agency notes Emerald’s claim that this alternative may result in formation of chlorinated organics, “[t]he Agency believes there are treatment alternatives for the possible formation of chlorinated organics in the effluent which Emerald has failed to evaluate.” Rec. at 12.

In its July 8, 2013 re-evaluation, Brown and Caldwell determined conceptual level comparative capital costs of \$1.4 million, conceptual level O/M costs of \$1.692 million, and total annual costs of \$2,111,000 with ammonia removal costs of \$12 per pound for this alternative. Appendix A at 7-8. Brown and Caldwell’s re-evaluation provided a Reliability Rating of 9. Comments noted that this is a “[v]ery complex system requiring active monitoring and safety controls.” Appendix D at 1.

#### **Single-Stage Biological Nitrification of Non-PC Wastewater**

Emerald reports that Brown and Caldwell considered “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.” Pet. at 26; *see* Appendix B at 5 (block flow diagram). Emerald states that “this was not a feasible compliance alternative because of the low level of ammonia reduction achieved. The percent ammonia reduction was only 47% yet had a present worth cost of \$4.9 million in 2004.” Pet. at 26.

In its recommendation, the Agency notes that “[t]he non-PC waste stream does not contain the inhibitor MBT.” Rec. at 12. The Agency adds that half of the facility’s bio-treaters are not now in use. *Id.*, citing Pet., Exh. 13 at 4. The Agency argues that, at a minimum, “Emerald should be required to treat the non-PC waste streams separately from the PC waste stream because nitrification will not be inhibited,” and the facility has equipment available to perform this treatment. Rec. at 12-13. Although the Agency acknowledges that treatment only of the non-PC waste stream will not achieve compliance, failure to perform that treatment supports the Agency’s position that “Emerald is not providing the best degree of treatment,” a requirement to obtain a mixing zone. Rec. at 13. In addition, the Agency notes that Emerald has not updated the estimated costs of this alternative since the filing of its petition in AS 02-5, when

it reported capital costs of \$2.6 million and annual O/M costs of \$220,000. *Id.* The Agency states that Emerald has not clarified “whether these costs estimates are based on use of the existing bio-treaters.” *Id.*

### **Biological Nitrification of Combined Wastewater**

Emerald states that this alternative involves “pH reduction of the PC tank discharge, followed by river water addition and combined single-stage nitrification with non-PC wastewater.” Pet. at 26; *see* Appendix B at 6 (block flow diagram). While Brown and Caldwell determined this to be a technically feasible alternative, it “suffers from a lack of reliability.” Pet. at 26. Emerald states that this option is also costly, with present worth costs of \$11.7 million in 2004. *Id.* Emerald submits that “this is an economically unreasonable alternative, particularly in light of the associated reliability concerns.” *Id.*

In its recommendation, the Agency notes that this alternative would reduce ammonia nitrogen in the effluent by 98%. Rec. at 13 (citing petition in AS 02-5). Although Emerald refers to present worth costs of \$11.7 million, the Agency notes estimated capital costs of \$4.4 million and annual O/M costs of \$730,000 in Noveon’s petition in AS 02-5. The Agency adds that Emerald has not updated these estimates since the filing of the petition in AS 02-5. *Id.*, n.2.

### **Ion Exchange**

Emerald states that Brown and Caldwell examined “ion exchange treatment of the secondary clarifier effluent using clinoptilolite, and ammonia selective ion exchange resin.” Pet. at 27; *see* Appendix B at 7 (block flow diagram). Emerald reports that testing of this alternative showed poor removal efficiency, presumably because of “the large concentration of competing ions in the effluent.” Pet. at 27. Emerald added that “[t]his alternative had a present worth cost of \$5.1 million in 2004.” *Id.*

In its recommendation, the Agency claimed that this alternative could achieve a 98% reduction. Rec. at 13-14. The Agency estimated capital costs of \$1.6 million and annual O/M costs of \$806,094. *Id.* at 14. The Agency added that the cost of ammonia nitrogen removed was approximately \$6.64 per pound for ten years and approximately \$5.46 per pound after ten years. *Id.* The Agency noted Emerald’s argument that poor selectivity precludes this alternative from further consideration. *Id.* However, the Agency claimed that “[t]his option should not be precluded from consideration considering its low cost and high removal.” *Id.*

The Agency’s recommendation also noted that Emerald had considered 75% ammonia nitrogen removal by ion exchange with capital costs of \$1 million and annual O/M costs of \$622,124. Rec. at 14, citing Pet., Exh. 13, Att. C. The Agency stated that the cost of ammonia nitrogen removal under this alternative was \$6.59 per pound for ten years. Rec. at 14.

In its July 8, 2013 re-evaluation, Brown and Caldwell determined conceptual level comparative capital costs of \$1.6 million, conceptual level O/M costs of \$806,000, and total annual costs of \$1,121,000 with ammonia removal costs of \$6.60 per pound for this alternative. Appendix A at 7-8. Brown and Caldwell’s re-evaluation provided a Reliability Rating of 6.

Appendix D at 2. Comments noted that the system is “[c]omplex to operate” and that “[e]quipment must be housed in heated building to prevent freezing.” Comments added that this alternative “should have little net effect on effluent TDS.” *Id.*

### **Ozonation**

Emerald stated that, although this alternative could meet the generally applicable ammonia standard, it was rejected because of its present worth cost of \$20.3 million in 2004. Pet. at 27; see Appendix B at 8 (block flow diagram). Emerald added that “this alternative would significantly increase the effluent TDS concentrations” and may also trigger BOD effluent limit violations. Pet. at 27.

In its recommendation, the Agency noted that this alternative would provide 98% reduction of ammonia nitrogen in the effluent with estimated capital costs of \$10.3 million and annual O/M costs of \$1.69 million. Rec. at 14, citing Pet. at 27; Pet., Exh. 13, Att. C. The Agency stated that the costs of ammonia nitrogen removal would be \$18.89 per pound for ten years, and \$11.50 per pound after ten years. Rec. at 14, citing Pet., Exh. 13, Att. C.

In its July 8, 2013 re-evaluation, Brown and Caldwell determined conceptual level comparative capital costs of \$10.4 million, conceptual level O/M costs of \$1,699,000, and total annual costs of \$3,196,000 with ammonia removal costs of \$19 per pound for this alternative. Appendix A at 7-8. Brown and Caldwell’s re-evaluation provided a Reliability Rating of 8. Appendix D at 2. Comments noted that this is a “[v]ery complex system requiring active monitoring and safety controls.” *Id.*

### **Tertiary Nitrification**

Emerald states that this alternative involves “pumping the secondary clarifier effluent through a separate aeration basin containing fixed film media where nitrifying bacteria would grow.” Pet. at 27. Emerald added that studies confirmed the technical feasibility of this alternative, although it lacks reliability because of “great sensitivity to variations in wastewater characteristics.” *Id.* at 28. Emerald reported present worth costs of \$11.4 million in 2004 and claimed that these costs made this alternative “economically unreasonable.” *Id.*

In its recommendation, the Agency noted that this alternative would provide 98% reduction in ammonia nitrogen with capital costs of \$6.76 million and annual O/M costs of \$464,000. Rec. at 15 (citing petition in AS 02-5). The Agency states that Emerald has not updated costs for this alternative. *Id.*

### **Options First Addressed in 2013.**

Brown and Caldwell reported that, “[s]ince 2004, several new treatment technologies have become demonstrated” and that these may reduce ammonia in the facility’s effluent. Appendix A at 9. Emerald evaluated several of these treatment technologies to determine whether they had the potential to reduce effluent ammonia levels at the facility. Appendix A at 9. Brown and Caldwell concluded that, although these new technologies have been recently

demonstrated and could provide affective ammonia reduction at the facility, none is as effective as those previously considered and discussed above. Appendix A at 9. Brown and Caldwell added that none is as “economically viable” as those previously considered. Pet. at 30-31. Because they were not considered to be economically viable, Emerald did not provide specific costs for these technologies. See Appendix A at 9. The Board briefly reviews each of these potential treatment options in the following subsections.

**Castion Ammonia Recovery Process.** Brown and Caldwell report that “[t]his process removes ammonia by combining stripping with ion exchange. The waste stream is first conditioned to volatilize ammonia for capture by vacuum distillation. Subsequently, the waste stream is exposed to an ion exchange resin.” Appendix A at 9. The report adds that this option costs more to build and operate than separate alkaline air stripping and ion exchange alternatives. *Id.*

**Ostara Pearl.** Brown and Caldwell state that this alternative “recovers nutrients from wastewater, including phosphorus and nitrogen containing compounds, and, subsequently, combines these nutrients with magnesium hydroxide to precipitate struvite.” Appendix A at 9. The report states that this is a proprietary name for the struvite precipitation alternative described above. *Id.*

**Liqui-Cell Membrane.** Brown and Caldwell report that this alternative “uses a membrane module to separate ammonia from a waste stream. The ammonia is then converted to ammonium salt.” Appendix A at 9. The report notes that “pH control would be required to elevate pH for stripping and lower pH for effluent discharge.” *Id.* The report further notes that the membrane requires a temperature between 40 and 55°C and that it would take significant expense to heat the waste stream. *Id.* Brown and Caldwell conclude that costs and results make this less viable than the alkaline air stripping alternatives. *Id.*

**Anammox.** Brown and Caldwell describe this as “a biological process that removes ammonia through anaerobic treatment.” Appendix A at 9. The report states that it is more prone to process upsets than the aerobic biological nitrification rejected for the facility because of “the presence of known bio-inhibitors and the complexity of site-wide wastewaters.” *Id.*

**Anodic Oxidation.** Brown and Caldwell state that this process “is capable of removing ammonia from waste streams by electrochemical oxidation.” Appendix A at 9. Specifically, the process applies a current to the wastewater, which deposits ammonia on an anode. *Id.* They report that this alternative requires significant capital expenditures and annual power costs of at least \$5 million. *Id.* They add that there has been no full-scale demonstration of this process at any facility. *Id.*

### **Summary of Agency’s Review of Alternatives**

The Agency first stresses that Emerald has provided cost estimates considered accurate to  $\pm 50\%$ . Rec. at 15, citing Pet., Exh. at 4. The Agency argues that, if these estimates are high by that margin, then “Emerald could achieve 98% reduction at a cost of as low as \$3.30 per pound

of ammonia removed by using ion exchange technology in the first ten years, and \$2.73 per pound thereafter.” Rec. at 15, citing Pet., Exh. 13, Att. C.

Second, the Agency states that Emerald has failed to consider “the use of granulated activated carbon followed by biological treatment.” Rec. at 15. The Agency argues that USEPA “guidance indicates that this treatment alternative effectively removes inhibitors, including MBT, which then allows for biological treatment.” *Id.* The Agency proposed that “Emerald evaluate the use of granular activated carbon column(s) before the PC tank waste water combines with non-PC tank waste water.” *Id.* The Agency adds that this option “may not require dilution.” *Id.*

Third, the Agency expresses the view that “the nitrogen in Emerald’s effluent could be of agronomic benefit through spray irrigation on crops.” Rec. at 15. The Agency argues that Emerald “failed to evaluate land application of its waste stream as an alternative.” *Id.*

Fourth, the Agency argues that “Emerald may be able to achieve nitrification by dilution of waste water from the PC tank with water from the Illinois River.” Rec. at 15. The Agency notes that the peak flow rate from the PC tank was 150 gallons per minute (gpm) in 2002, and the average flow rate from the same tank in 2011 was 72 gpm. *Id.*, citing Pet., Exh. 13 at 2. The Agency asserts that “Emerald should investigate replacing an appropriate amount of the decreased flow from 2001 to 2011 with water from the Illinois River that will allow single-stage nitrification.” Rec. at 15-16. The Agency argues that, with a lower flow rate, dilution can have a greater impact on costs and issues such as TDS, fouling, and formation of chlorinated organics. *Id.* at 16. The Agency further argues that Emerald has not conducted testing that addresses this impact. *Id.*

### Summary

Emerald argues that it and the facility’s previous owner have reviewed a number of alternatives for achieving compliance with the generally applicable ammonia standard. Pet. at 31. Emerald further argues that, as in AS 02-5, “there is no alternative that is both technically feasible and economically reasonable” that would attain compliance with that standard. *Id.*

### SUMMARY OF AGENCY’S RECOMMENDATION

On January 14, 2013, the Agency filed its recommendation that the Board deny Emerald’s petition. Rec. at 1, 22; *see* 35 Ill. Adm. Code 104.416. Below in its discussion, the Board reviews the Agency’s arguments on the Section 28.1 factors. In the following subsections, the Board summarizes the recommendation and the conditions proposed by the Agency in the event that the Board granted relief over the Agency’s objection.

### Recommendation

The Agency states that it “does not believe Emerald has met its burden of proof to obtain an adjusted standard. Rec. at 22. The Agency also argues that the Board lacks authority to grant the requested relief because the co-permittee, PolyOne, is not a party. *Id.* The Agency recommended that the Board deny Emerald’s petition for an adjusted standard. *Id.*

The Agency recommends that, if the Board determines to grant Emerald's requested adjusted standard over this objection, the Board should include conditions. *Id.*; see 415 ILCS 5/28.1(a) (2012). The Board summarizes these proposed conditions in the following sections.

### **Effluent Limit**

As the first condition, the Agency proposed that "Emerald's effluent limit for ammonia nitrogen be reduced by 48% from 155 mg/L to 80 mg/L to reflect the 48% reduction in the effluent waste load." Rec. at 22.

In its response to the Board's hearing officer order, Emerald stated that it "is not able to accept the Agency proposed reduced effluent limits and is currently evaluating historical data in order to propose alternative reduced effluent limitations." Oct. Resp. at 6.

In response to the Board's hearing officer order, the Agency recommended "new limits for ammonia based on DMR data from the last 5 years." Agency Resp. Exh. 1 at 8. The Agency proposed a daily maximum of 130 mg/L and 1000 lbs/day, a monthly average of 100 mg/l and 750 lbs/day, and an annual average of 80 mg/L and 550 lbs/day. *Id.* at 9. The Agency claimed that "Emerald should be required to comply with the water quality standards at the edge of the ZID and mixing zone because Emerald is not seeking relief from the water quality standard in this proceeding." *Id.* The Agency argues that these data show Emerald has met these limits "except during the 2011 strike which caused poor treatment performance." *Id.* at 8.

### **WET Testing**

As the second condition, the Agency proposed to require that "Emerald performs aquatic life whole effluent toxicity tests using a fish (fathead minnow) and invertebrate (*Ceriodaphnia*) using an effluent dilution series that will allow for 100% survival in the lowest effluent concentration tested. A successful test and dilution series will result in an LC<sub>50</sub> effluent concentration that does not include a 'less than' designation." Rec. at 22.

In its response to the Board's hearing officer order, Emerald stated that it "understands the issue with the previous testing results and for all future whole effluent toxicity testing, Emerald will contract with a laboratory that understands the requirements, conducts the test using additional dilutions if necessary to report the results such that the LC<sub>50</sub> effluent concentrations does not include a 'less than' designation." Oct. Resp. at 6.

Emerald subsequently submitted results of whole effluent toxicity testing dated November 22, 2013, showing an LC<sub>50</sub> result of 16.49% for the 48-hour *Ceriodaphnia dubia* test and 16.79% for the 96-hour *Pimephales promelas* test. Appendix B.

### **Quarterly Monitoring**

As the third condition, the Agency proposed to require that “Emerald conducts quarterly monitoring of ammonia nitrogen in the Illinois River to demonstrate compliance with the ammonia water quality standards in accordance with 35 Ill. Adm. Code 302.212.” Rec. at 22.

In its response to the Board’s hearing officer order, Emerald noted that “[t]his requirement is a condition contained in the current NPDES permit.” Oct. Resp. at 6; *see* Pet., Exh. 2. Emerald added that, “based on the amount of data collected to date, as well as safety concerns, Emerald would like to eliminate this sampling in the future.” Oct. Resp. at 6.

#### **Investigation of Production Methods**

As the fourth condition, the Agency proposed to require that “Emerald investigates new production methods and technologies that generate less ammonia in Emerald’s discharge.” Rec. at 22.

In its response to the Board’s hearing officer order, Emerald stated that “[t]his requirement is a condition contained in the current NPDES permit.” Oct. Resp. at 6. Emerald added that, although there are limitations in the modifications that can be made in the production methods and technologies, Emerald can continue to review available new production methods and technologies (*via* internet searches, consultant or IEPA notifications, etc.) on a regular basis.” *Id.*

#### **Investigation of Treatment Technologies**

As the fifth condition, the Agency proposed to require that “Emerald investigates new treatment technologies, including but not limited to Fenton’s reagent treatment, photo assisted Fenton system, hydrogen peroxide/uv treatment, and evaluates implementation of new and existing technologies based on current plant conditions.” Rec. at 23.

In its response to the Board’s hearing officer order, Emerald stated that it “can incorporate a review of new treatment technologies into appropriate project reviews and as well as review available treatment technologies (*via* internet searches, consultant or IEPA notifications, etc.) on a regular basis.” Oct. Resp. at 6-7. Emerald added that, “[i]f a treatment technology would be determined to be potentially viable, a schedule for further evaluation would be developed. It is anticipated that evaluations and studies would proceed with a phased approach, with termination at any point where it is determined to not be a feasible alternative.” *Id.* at 7.

#### **Study of Granular Activated Carbon**

As the sixth condition, the Agency proposed to require that “Emerald investigates and submits a study to the Illinois EPA on the use of granular activated carbon column of the PC tank waste water before the waste water combines with non-PC tank waste water, followed by biological nitrification.” Rec. at 23.

In its response to the Board's hearing officer order, Emerald noted the Agency's indication that "the study should include a technical feasibility evaluation, and economic feasibility analysis, and test data (or other data) analysis." Oct. Resp. at 7. Emerald stated that it "can complete such a study." *Id.*

### **Spray Irrigation**

As the seventh condition, the Agency proposed to require that "Emerald investigates and submits a study to Illinois EPA on the use of its effluent for spray irrigation on crops." Rec. at 23.

In its response to the Board's hearing officer order, Emerald states that, "[a]lthough land application could be used only when the ground is able to absorb water (*i.e.*, soils not saturated or frozen), Emerald can investigate further, although it is assumed that constituents other than nitrogen/ammonia contained within the effluent (*i.e.*, salts), will have a significant detrimental effect on the land/crops that would preclude this as a viable option for effluent use." Oct. Resp. at 7. Emerald also expressed the view that "it is likely that local farmers/neighbors would be reluctant to use wastewater from the facility." *Id.*

### **Dilution of Wastewater**

As the eighth condition, the Agency proposed to require that "Emerald investigates and submits a study to Illinois EPA on the dilution of waste water from the PC tank with water from the Illinois River." Rec. at 23. In response to a Board hearing officer order, the Agency explained that this proposed condition intends "to dilute the concentration of MTB to a level that would not inhibit nitrification in the treatment plant." Agency Resp. Exh. 1 at 7. The Agency argues that, "[s]ince this would be an internal dilution in order to allow nitrification treatment to occur and is not to merely meet limits on its own, it would be allowable under 35 Ill. Adm. Code 304.102(b) [Dilution]." *Id.*

In its response to the Board's hearing officer order, Emerald stated that, "[a]lthough the Agency believes Emerald should investigate replacing an appropriate amount of the decreased flow from 2001 to 2011 with water from the Illinois River that will allow single-stage nitrification, Emerald does not agree that this option is viable, and future plans for increasing capacity/production at the plant could negate this as an option." Oct. Resp. at 7.

### **Annual Reports**

As the ninth condition, the Agency proposed to require that "Emerald prepares and submits to the Illinois EPA annual reports summarizing its activities to comply with the above stated recommendation." Rec. at 23.

In its response to the Board's hearing officer order, Emerald noted that "[t]his requirement is a condition contained in the current NPDES permit." Oct. Resp. at 7; *see* Pet., Exh. 2. Emerald adds that it "can continue to prepare and submit reports." Oct. Resp. at 7.

**Potential Conditions Raised by Board**

**Sunset**

In a hearing officer order, the Board sought comment on a potential condition that would “sunset the requested relief in 7 years, coupled with conditions that would establish annually recurring requirements regarding investigation into new treatment and methods to continually demonstrate Emerald is providing ‘best degree of treatment’” and coupled also with specified conditions recommended by the Agency. Oct. Resp. at 8; *see* Rec. at 22-23. Emerald responded that it was discussing potential conditions with the Agency and understood the Board’s indication that a sunset may be appropriate. Oct. Resp. at 8. Emerald stated that, although it

believes that a sunset provision is better than having no relief granted by the Board – and can accept a sunset provision – in lieu of evaluations at the end of the sunset period . . . to determine if a renewal of the adjusted standard is needed, Emerald believes it would be a more effective and meaningful use of monies to evaluate on an ongoing basis new treatment technologies and production methods, and to implement those technologies (if warranted) to ensure the best degree of treatment. *Id.*

The Agency responded that it

does not believe any relief should be granted to Emerald. If the Board grants Emerald relief, a sunset provision and 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 should be included. Agency Resp. Exh. 1 at 8.

The Agency added that “Emerald’s effluent has a high COD [chemical oxygen demand] to BOD ratio (38.4:1), which suggests the presence of organics that are not amenable to biological degradation. Because of the masking effect that ammonia has, any potential problematic organic compounds would not be revealed by toxicity testing.” *Id.* To address this, the Agency “requests that Emerald be required to identify organics in the effluent and to propose treatment technologies that may be used to reduce the organics in the effluent.” *Id.*

**Best Management Practices**

The Board also asked Emerald to comment on a potential condition that would impose the requested ammonia effluent limit, require discharge through the diffuser meeting water quality standards at the edge of the ZID and mixing zone, and implement a non-point source best management practice (BMP) addressing ammonia. Oct. Resp. at 8-9. Emerald stated that,

[i]f a sunset provision were to be included in an adjusted standard granted by the Board, with a provision to discharge through the diffuser to meet applicable water quality standards at the edge of the ZID and mixing zone, Emerald believes the

best, most efficient and meaningful use of monies would be to complete evaluations of new treatment technologies and production methods rather than implementing maintaining a non-point source BMP that would provide an environmental benefit that also addresses ammonia. *Id.* at 9.

The Board also asked Emerald to address projects such as the agricultural BMPs outlined on the Agency website. Oct. Resp. at 10. Emerald responded that it did not now regard consideration of such a project is realistic. *Id.* Emerald argued that it has “negligible” ability to affect non-point source pollution from agriculture. *Id.*

The Agency stated that, if the Board grants Emerald’s requested relief, it “would not oppose a condition in Emerald’s permit to implement and maintain a non-point source best management practices to provide an environmental benefit that also addresses ammonia.” Agency Resp. Exh. 1 at 9. The Agency added that it “is unsure that Emerald will be able to find a sufficient number of nonpoint sources to off-set the high levels of ammonia in Emerald’s discharge.” *Id.*

### **Hearing**

In its Recommendation, the Agency noted Emerald’s request that the Board hold a hearing. Rec. at 21. The Agency stated that it did “not believe a hearing is necessary for the Board to determine whether Emerald has provided adequate proof that the elements set forth in Section 28.1(c)” of the Act have been met. *Id.* The Agency notes that the Board held three days of hearing on the petition in AS 02-5. *Id.* The Agency argues that the petition in that case is “virtually identical” to the petition submitted to the Board in this proceeding. *Id.* at 22. The Agency states that it “does not believe additional hearings in this matter will be beneficial.” *Id.*

### **AGREED RECOMMENDED CONDITIONS**

The Agency and Emerald reported that they had “reached an agreement on the recommended conditions that should be included in any regulatory relief granted by the Board. Joint Rec. Conds. at 1. The Agency stated, however, that it “continues to maintain that the Board should not grant Emerald’s requested adjusted standard for the reasons set forth in its Recommendation.” *Id.*, citing Rec. The Agency and Emerald stated that agreed conditions are based on revisions of conditions originally proposed by the Agency in its recommendation. Joint Rec. Conds. at 1-2, citing Rec. at 22-23. In its discussion below, the Board summarizes the agreed recommended conditions and compares them with the conditions imposed by the Board in granting relief in AS 02-5.

### **BOARD DISCUSSION**

Emerald seeks relief in the form of an adjusted standard from the Board total ammonia nitrogen effluent standard at Section 304.122(b) of the Board’s water pollution regulations. Although the Agency recommends that the Board deny the request, the Agency and Emerald jointly proposed agreed conditions to be included in any relief granted by the Board. As noted

above under “Legal Framework for Adjusted Standard,” Section 28.1(c) of the Act requires Emerald as petitioner for an adjusted standard to demonstrate that

- 1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to the petitioner;
- 2) the existence of those factors justifies an adjusted standard;
- 3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
- 4) the adjusted standard is consistent with any applicable federal law. 415 ILCS 5/28.1(c) (2012); 35 Ill. Adm. Code 104.426 (Burden of Proof).

The Board separately addresses each of these four factors in the following subsections of the opinion.

#### **Substantially and Significantly Different Factors (415 ILCS 5/28.1(c)(1))**

##### **Emerald**

Emerald states that the generally applicable ammonia nitrogen as N standard is based first on the ability to treat ammonia. Pet. at 33, citing 35 Ill. Adm. Code 304.122. Emerald acknowledges the Board’s statement that “present technology is capable of meeting this limit and should result in the removal of much ammonia nitrification oxygen demand. . . .” Pet. at 33, citing In the Matter of Water Quality Standards Revisions, R72-4 (Nov. 8, 1973). Emerald argues that, as applied to its discharge, numerous investigations “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).” Pet. at 33.

Emerald states that the generally applicable effluent standard also intended to address DO sags in the receiving stream believed to be caused by ammonia nitrogen discharges. Pet. at 33. Emerald argues that these “sags were later determined to be caused primarily by sediment oxygen demand.” *Id.* Emerald further argues that “[a]mmonia nitrogen discharged at the level requested by Emerald will thus have minimal, if any, impact upon the level of DO in the Illinois River.” *Id.* at 33-34, citing Exh. 2 (NPDES permit). Emerald asserts that discharges at this level will not “contribute to any water quality violations or harm to aquatic life.” Pet. at 34, citing *id.* at 20-31 (compliance alternatives).

Emerald concludes that “the factors relied upon by the Board in adopting what is now 35 Ill. Adm. Code 304.122 were substantially different” from those factors applicable to the facility. Pet. at 34.

##### **Agency**

The Agency states that the Board relied on two factors in adopting the generally applicable standard: “(1) the impact of ammonia nitrogen in wastewater discharges on dissolved oxygen demand in the receiving stream, and (2) technology present in 1974 allowed dischargers to treat their effluent to meet the 3 mg/L limit.” Rec. at 16-17, citing Pet. at 33; *see* Water Quality Standards Revisions, R72-4, slip op. at 1 (Nov. 8, 1973). The Agency states that the facility’s treatment process “generates large amounts of ammonia nitrogen during secondary treatment because of the presence of degradable organic nitrogen compounds.” Rec. at 17. The Agency further states that the presence of MBT inhibits nitrification, causing ammonia nitrogen released during wastewater treatment process to remain in the effluent. *Id.*, citing Pet., Exh. 1 at 5-6. The Agency adds that low levels of alkalinity in the wastewater required addition of alkalinity in order to achieve nitrification. Rec. at 17, citing Pet., Exh. 1 at 6.

The Agency cites Emerald’s argument that, “while technology exists to treat discharges to meet the ammonia nitrogen limit, these technologies are not technologically feasible and economically reasonable when applied to Emerald’s discharge.” Rec. at 17, citing Pet. at 33. The Agency notes that the Board concluded in 2004 “that Emerald’s discharge has unique characteristics making the plant unable to achieve nitrification, which makes Emerald different from other industries and POTWs [publicly-owned treatment works].” Rec. at 17, citing Pet., Exh. 1 at 17.

The Agency argues that the compliance alternatives addressed by Emerald in its petition existed when the Board adopted the generally applicable standard. Rec. at 17. The Agency also further argues that Emerald’s discharge still contains MBT and has not changed since the Board decided AS 02-5. *Id.* The Agency argues that, although nitrification at the facility “may be more complicated, Emerald has provided no evidence that the presence of MBT in the discharge creates technical factors or costs not considered by the Board in initially adopting” the generally applicable standard. *Id.*

### **Board Discussion**

In 1972, the Board adopted as Rule 406 an ammonia effluent standard to address the impact of ammonia nitrogen in municipal wastewater treatment plant discharges on oxygen demand. Effluent Criteria, Water Quality Standards Revisions, Water Quality Standards Revisions for Intrastate Waters (SWB-14), R 70-8, 71-14, 71-20 (cons.), slip op at 6, 25 (Jan. 6, 1972). On June 28, 1973, the Board amended that provision to address industrial dischargers of ammonia. Water Quality Standards Revisions, R 72-4, slip op. at 1 (Nov. 8, 1973). The Board stated that “[a]mmonia removal from such industrial wastes, when compared with removal from domestic wastes is rather easily applied.” *Id.* (citation omitted).

In its original adoption of the ammonia nitrogen effluent standard for sources discharging to the Illinois River, the Board stated that “[t]he evidence is clear that for too long the oxygen demand exerted by ammonia in domestic wastes has been overlooked in the emphasis on reduction of five-day BOD [biological oxygen demand]. The State Water Survey has conclusively shown that reduction of ammonia from the larger sources feeding the Illinois River is necessary if existing standards, essential to an adequate fish population, are to be met.”

Effluent Criteria, Water Quality Standards Revisions, Water Quality Standards Revisions for Intrastate Waters (SWB-14), R 70-8, 71-14, 71-20 (cons.), slip op at 6 (Jan. 6, 1972). However, since adoption of the effluent standard, studies have addressed dissolved oxygen concentrations in the Illinois River. Emerald produced studies including one reporting that, during 7-day, 10-year low flows in the LaGrange pool of the Illinois River below Peoria, only 13% of oxygen demand was attributable to nitrogenous biochemical oxygen demand. The study reported that oxygen demand during those flows was 57% carbonaceous and 30% sediment. Thomas Butts, *et al.*, WATER QUALITY ASSESSMENT AND WASTE ASSIMILATIVE ANALYSIS OF THE LAGRANGE POOL, ILLINOIS RIVER (State Water Survey Division, Illinois Institute of Natural Resources June 1981) at 105; April Resp. at 1.

In AS 02-5, the Board stated that ammonia nitrogen in the facility's discharge stems from the presence of degradable organic nitrogen compounds and their degradation in the waste treatment process. The Board noted factors, including the presence of MBT, inhibiting the nitrification of the ammonia. Because of these inhibiting factors, ammonia nitrogen released during the treatment process remains in the effluent. The Board stated that the unique characteristics of the facility's wastewater inhibited nitrification. The Board found that the quality and composition of the discharge from the facility "is substantially and significantly different than wastewaters of other industries and POTWs." The Board concluded that it had not anticipated the chemical manufacturing processes at the facility "when it promulgated the ammonia effluent limit at Section 304.122(b), applicable mainly to other industrial dischargers, in 1972." Noveon, slip op. at 17 (Nov. 4, 2004).

The record in this proceeding shows that the operation of the facility has not changed substantially since the Board granted an adjusted standard in AS 02-5. The presence of MBT continues to be a significant factor inhibiting nitrification of ammonia on the facility's discharge. Further, the record shows that the Board's original adoption of generally applicable ammonia nitrogen standards chiefly considered the impact of discharges from POTWs. While the original rule was amended to include industrial dischargers, the Board has found that the facility's wastewater discharge differs substantially and significantly from the discharge of other industries and POTWs. The record also indicates that dissolved oxygen sags in the Illinois River are attributable largely to sediment oxygen demand and CBOD. Also, the record indicates that the Illinois River meets the Board's DO water quality standard of 5 mg/L upstream and downstream from the facility during critical low flow and high temperature conditions. Therefore, the Board finds on the basis of this record that factors relating to Emerald are substantially and significantly different from the factors relied upon by the Board in adopting the generally applicable regulation.

**Factors Justify Adjusted Standard (415 ILCS 5/28.1(c)(2))**

**Emerald**

Emerald argues that the generally applicable standard was "based on balancing the potential adverse impact upon DO against the cost and ease of control." Pet. at 34. Emerald first asserts that compliance with the generally applicable standard would provide minimal beneficial impact to the Illinois River. *Id.* Compared to this minimal benefit, Emerald argues that "the high cost of technically feasible control technology makes it economically unreasonable for

Emerald to meet this effluent limitation.” *Id.* Emerald concludes that both of these factors support granting the requested relief. *Id.*

### Agency

The Agency argues that, while economic reasonableness is a factor the Board considers in adopting regulations, it is not a factor in the level of justification for obtaining an adjusted standard. Rec. at 17, citing 415 ILCS 5/27, 28.1(c) (2012). The Agency suggests that, before the Board considers cost, Emerald “should have to demonstrate that the costs are substantially and significantly different than the costs of treatment that the Board initially considered when promulgating the ammonia nitrogen effluent limit.” Rec. at 18.

The Agency argues that Emerald did not “present evidence that the cost of treating its effluent for ammonia nitrogen is higher than the costs expended by POTWs or other industrial plants, or higher than the costs contemplated by the Board when adopting Section 304.122.” Rec. at 18. The Agency further argues that Emerald’s estimated capital costs are comparable to capital costs paid between 1998 and 2002 by three Illinois municipalities for POTWs. *Id.* The Agency asserts that Emerald “should be expected to pay the same costs as others in the industry.” *Id.*

The Agency notes Emerald’s argument that generally applicable ammonia nitrogen effluent limit of 3 mg/L “has little to no measurable impact to the Illinois River.” Rec. at 19, citing Pet. at 34. The Agency argues that this position fails to justify an adjusted standard. Rec. at 19. The Agency suggests that, if Emerald considers the current regulation to be ineffectual, it should submit to the Board a rulemaking proposal to amend the standard. *Id.*

The Agency explains that the term “LC50” refers to “the concentration of a toxic substance or effluent which is lethal to 50% of the exposed organisms in a given period of time. Rec. at 19, n.3. The Agency states that Emerald “is the only discharger in the state that has failed to improve the toxicity of its effluent above the single digit percentage LC50 level.” *Id.* The Agency argues that LC50 values this toxic “are not found at any other Illinois facility.” *Id.*

The Agency concludes that “Emerald has failed to meet its burden of proof under Section 28.1(c)(2) of the Act.” Rec. at 19, citing 415 ILCS 5/28.1(c)(2) (2012).

### Board Discussion

The Board found above that factors relating to Emerald are substantially and significantly different from the factors relied upon by the Board in adopting the generally applicable regulation. Emerald argues that these distinguishing factors justify an adjusted standard because there are no treatment options for removal of ammonia nitrogen that are economically reasonable and technically feasible, especially in light of the impact of removal on DO levels in the Illinois River. *See* Pet. at 34.

**Alternative Treatment Technologies.** In AS 02-5, the Board compared alternatives investigated by Noveon to those investigated and implemented in site-specific rulemakings addressing other facilities seeking relief from the total ammonia-nitrogen effluent standard at

Section 304.122(b). Noveon slip op. at 17 (Nov. 4, 2004), citing Petition of PDV Midwest Refining, L.L.C. for a Site-Specific Rulemaking Amendment to 35 Ill. Adm. Code 304.213, R98-14 (Dec. 17, 1998); Site-Specific Petition of Mobil Oil Corp. for Relief From 35 Ill. Adm. Code 304.122, Ammonia Nitrogen Effluent Standards, R97-28 (Jan. 22, 1998). The Board found that, although the costs of some alternatives for ammonia removal at the facility are less than the costs of technologies implemented in previous site-specific rulemakings, “the overall cost of reducing ammonia nitrogen would be significantly higher due to the large quantity of ammonia that Noveon must remove to meet the ammonia nitrogen limit. Noveon slip op. at 17 (Nov. 4, 2004)).

As noted above under “Post-Treatment of Wastestream,” the removal alternatives investigated by Emerald vary in cost and effectiveness. The Board notes that reducing Emerald’s current effluent concentration from 155 mg/L to the generally applicable limit of 3.0 mg/L would require 98% removal. Brown and Caldwell’s updated 2013 report summarized the effectiveness of 17 variations of seven alternatives based on factors including off-gas treatment and ammonia-nitrogen removal percentage. The report also presented total annual costs in dollars per year for capital and operations and maintenance (O&M), and cost in dollars per pound of ammonia nitrogen removed:

Alternative	Ammonia-nitrogen removal (%)	Total Annual Capital and O&M Costs (\$/year)	Cost of Ammonia-nitrogen removed (\$/lb)
1. PC Tank Stripping			
with off-gas treatment	1.5	791,874	309.93
with off-gas treatment	1.5	579,572	226.84
2. PVC Tank Stripping			
without off-gas treatment	44.8	4,227,613	54.63
without off-gas treatment	22.4	2,466,086	63.74
3. Effluent Stripping			
with off-gas treatment	95.0	3,357,314	20.47
without off-gas treatment	95.0	2,533,862	15.45
without off-gas treatment	71.3	2,410,996	19.60
without off-gas treatment	47.5	1,374,025	16.76
without off-gas treatment	23.8	799,936	19.51
4. Struvite Precipitation			
	18.6	1,678,220	52.25
	21.5	1,478,707	39.79
5. Effluent Breakpoint Chlorination	98.0	2,110,918	12.48
6. Effluent Ion Exchange			
	98.0	1,120,526	6.62
	73.5	836,090	6.59
	49.0	590,670	6.98
	24.5	342,842	8.11
7. Ozonation	98.0	3,196,148	18.89

Appendix A, Attachment C. As summarized above, total annual costs of technological alternatives including O&M range from \$342,832 per year for approximately 25% removal to \$836,090 per year for approximately 75% removal to \$1,120,526 per year for 98% removal for the least expensive options. *Id.* The Board emphasizes that reducing Emerald's current effluent concentration limit from 155 mg/L to the generally applicable limit of 3.0 mg/L would require 98% removal.

**Agency Objections.** The Agency argues that Emerald did not “present evidence that the cost of treating its effluent for ammonia nitrogen is higher than the costs expended by POTWs or other industrial plants, or higher than the costs contemplated by the Board when adopting Section 304.122.” Rec. at 18. As in AS 02-5, the Agency argues that “capital costs are comparable or lower than the capital costs expended by POTWs.” Rec. at 18. The Agency cites capital costs for single stage nitrification facilities at POTWs for the municipalities of Geneva, Batavia, and Saint Charles, Illinois. These capital costs ranged from \$6,000,000 for Batavia's 4.2 mgd plant to \$8,400,000 for Geneva's 5 mgd plant and Saint Charles' 9 mgd plants. Rec. at 18; *see Noveon* (June 18, 2003) (Agency recommendation). However, the Agency has acknowledged that “[n]one of these figures include O&M costs which constitute a significant percentage of the figures presented by Noveon.” *Noveon* (June 18, 2003).

In this regard, the Board notes the testimony on behalf of Noveon in AS 02-5 by Mr. T. Houston Flippin:

The comparisons made by the IEPA considered only the capital costs of single stage nitrification. Operations and maintenance (annual) costs were not included in the comparison. However, . . . these annual costs for Noveon would be significant. The facilities used in the comparisons by the IEPA were likely required to add little or no chemicals to achieve nitrification whereas the Noveon-Henry Plant would be required to spend \$788,000 annually on chemicals alone. This high chemical cost is due to chemicals required for the pH 2 pretreatment process (acid to lower the pH and caustic to raise the pH for biological treatment) and caustic required providing the alkalinity consumed in nitrification. This yields a present worth chemical only cost of \$5.29 million excluded from the cost comparisons made by IEPA (based on a 10 year project life). . . . [T]his is a significant omission in cost comparisons. . . . Only present worth cost comparisons are meaningful when there is a significant difference in operating costs as in the case here. *Noveon* (Feb. 9, 2004).

The Board finds that the Agency's comparison of the capital costs of Emerald's alternatives to those of POTWs does not provide a complete perspective. The Agency's comparison did not consider O&M costs, which would be significantly higher for Emerald than a POTW. The Agency also did not offer capital costs in terms of annualized costs or present worth costs as Emerald did to make a more direct comparison. For the values in the table above, Emerald followed USEPA's Interim Economic Guidance for Water Quality Standards, EPA-823-B-95-002, to compute total annual costs based on the annualized capital cost and annual cost of O&M. Pet. at 30. The Agency also did not use total annual costs to normalize the \$/lb NH<sub>3</sub>-

N removed from the POTWs as Emerald did in order to compare costs on a pound-by-pound basis. Appendix A, Attachment C.

In addition, the Board notes that POTWs cited by the Agency treat 4.2 to 9 mgd, while Emerald's operations produce approximately 150,000 gallons per day, a 28- to 60-fold difference. Pet. at 13-14. Also, both the 2013 Brown and Caldwell report and 1995 Eckenfelder Inc. study note that, although the facility's wastewater treatment plant operates at conditions that would prompt biological nitrification, waste load characteristics inhibit nitrifying bacteria. Pet. at 21, 29; Appendix A at 4; Noveon (May 28, 2002) (Exhibit 6 at 1-1).

In light of the factors noted above, the Board concludes that the Agency's comparison of Emerald's facility with single-stage nitrification at a POTW does not accurately reflect Emerald's treatment options in terms of cost, size, or complexity.

#### **Investigation of Production Methods and Technologies under AS 02-5**

As noted above under "Summary of Previous Board Proceedings Regarding Facility," the Board granted the previous owner of the facility an adjusted standard subject to a number of conditions. Noveon, slip op. at 22-23 (Nov. 4, 2004). One condition requires continued investigation of production methods and technologies that generate less ammonia in the facility's discharge. The condition also requires preparation and submission of an annual report "summarizing the activities and results of these investigatory issues." *Id.* at 22. Emerald submitted to the Agency annual reports summarizing its investigations since grant of an adjusted standard in AS 02-5.

**2006.** Emerald reported that it was working on two projects with potential to reduce generation of ammonia at the facility's wastewater treatment system. The first was replacement of a BBTS wet scrubber for particulates with a BBTS Dust Collector System. Exh. 6 at 1; April Resp. at 4. Emerald reported that, "[a]t the time of project development, there was an estimate of 75 to 87 lbs. of BBTS per batch that would be eliminated from the wastewater treatment process. This would translate into a reduction of 8 to 10 lbs. of ammonia to the river for each batch of BBTS produced." April Resp. at 4. In 2007, Emerald reported that it had performed this replacement, which improved process efficiency and prevented loss of an unspecified amount of finished BBTS product to the facility's wastewater. Pet., Exh. 6 at 2.

Emerald stated that the second project was improvement of acetonitrile column efficiency to meet the NESHP for Miscellaneous Organics. Exh. 6 at 1; April Resp. at 4. Emerald reported that a task force "collected flow, composition and performance data from the process." April Resp. at 4. Emerald added that much of the work involved data collection and analysis and that data regarding reduction of ammonia in the effluent, if any, are not available. *Id.*

**2007.** Emerald reported that it was working on three projects with potential to reduce generation of ammonia at the facility's wastewater treatment system. *See* Exh. 6 at 2. The first was investigation of a sintered filter media for BHS filters. *Id.* Emerald reported that it had reviewed 2000-2001 studies on changing filter media for some processes and developed specifications for ordering new filter cloths. April Resp. at 5. Emerald considered trials of the

new cloths unsuccessful “as they continued to blind and require frequent change out which was determined to be cost prohibitive.” *Id.*

The second project was improving acetonitrile column efficiency to meet the NESHAP for Miscellaneous Organics. Exh. 6 at 2. Emerald stated that the work of the 2006 task force culminated “in a large construction and design capitol project intended to increase column efficiency and reduce emissions to the waste water treatment plant (WWTP). The final proposal was rejected due to cost concerns.” April Resp. at 5

The third project was investigation of the Anammox process for anaerobic treatment of high concentrations of ammonia. Exh. 6 at 2-3; April Resp. at 4. Emerald reported that this process experiences more upsets than aerobic biological nitrification that was discounted for use at the facility “due to the presence of known bio-inhibitors and the complexity of site-wide wastewaters.” April Resp. at 5. Emerald concluded that its “waste stream would render the process performance unstable.” Exh. 6 at 3.

**2008.** Emerald reported that it was working on three projects with potential to reduce generation of ammonia at the facility’s wastewater treatment system. Exh. 6 at 4; *see* Rec. at 7. The first was training wastewater treatment operators with a focus on improving treatment to reduce effluent ammonia. Exh. 6 at 4; *see* April Resp. at 6. Emerald reported that improving biological treatment at the facility “will actually increase effluent ammonia-nitrogen rather than decrease effluent NH<sub>3</sub>-N because a greater fraction of organic nitrogen will be degraded to NH<sub>3</sub>-N.” April Resp. at 6. Emerald states that the facility “cannot support nitrifying bacteria that convert NH<sub>3</sub>-N to NO<sub>3</sub>-N.” April Resp. at 6.

The second project was conducting Feed Batch Reactor testing to quantify bio-inhibitions present in the system. Exh. 6 at 4. Emerald stated that this testing examined “the potential impacts of NASH wastewater on the wastewater treatment system’s COD [chemical oxygen demand] (and associated BOD) removal capability.” April Resp. at 6. Emerald concluded that “implementation did not reduce ammonia in the effluent.” *Id.*

The third project was initiating a study of the effects of carbon dioxide for pH buffering. Exh. 6 at 4. Emerald reported that, although this was considered as a way to reduce chemical costs for neutralization and sludge conditioning, “[i]ts implementation did not reduce ammonia in the effluent.” April Resp. at 6. In 2009, Emerald reported that implementation of carbon dioxide neutralization “did not reduce ammonia in the effluent.” *Id.* at 5.

**2009.** Emerald reported that it was working on “[i]mprovements to the Tertiary Butyl Amine column increasing the recovery of TBA resulting in less amine to the sewer.” Exh. 6 at 5. Emerald reported that it found no data indicating that “improvements to the TBA column resulted in reduction of ammonia in the effluent.” April Resp. at 5.

**2010.** Emerald reported that it was working on two projects with potential to reduce generation of ammonia at the facility’s wastewater treatment system. The first was incorporating “ammonia reduction as a metric in the employee gain sharing plan.” Exh. 6 at 7. Emerald specified that “[t]he desired ratio of lbs. of ammonia per MMlbs of product produced was added

to the gain sharing plan for 2010 onward in an effort to keep employees focused on reducing ammonia emissions.” April Resp. at 6. Emerald stated that, “[a]lthough reductions in the ammonia in the effluent are noted, data regarding reductions of ammonia that can be attributed specifically to adding this metric to the gain sharing plan are not available.” *Id.*

The second project was conducting additional tests to determine sources of ammonia within the facility. Exh. 6 at 7. Emerald specified that “[t]esting was completed in 2011 and focused on the TKN and NH<sub>3</sub>-N loading from the various contributing stream to the wastewater treatment plant (PVS tank discharge, PC tank discharge, C-18 tank discharge, and Holding Pond/Well No. 3 discharge).” April Resp. at 6, citing Exh. 13 at 2-3 (Table 1: Influent Wasteloads Used in Developing Treatment Alternatives). Emerald reported that “[a]dditional testing was completed in 2012 and was focused on the C18 tank, the PC tank, the PVC tank, the biotreater feed, and the filter press feed.” April Resp. at 6. Emerald stated that “results of the 2012 sampling and analysis are still being evaluated to determine if additional sampling is warranted.” *Id.*

**2011.** Emerald reported that it was working on a project to improve instrumentation around the acetonitrile recovery column to reduce the ammonia concentration in effluent from the facility’s wastewater treatment system. Exh. 6 at 9; *see* Rec. at 7-8. Emerald reported that it installed two pressure transmitters in late 2011 and early 2012. April Resp. at 7. Emerald reported that, although this gives “production staff absolute pressure and differential pressure data to assist in the performance of the column,” it has no data indicating that this has resulted in reduced effluent ammonia. *Id.*

The Board notes that, although annual reports indicate that Emerald investigated a number of new technologies and production methods for generation of less ammonia, Emerald reported that it had not completed any voluntary environmental projects designed to improve the Illinois River. April Resp. at 8. Emerald cited financial obstacles to projects of this nature. *Id.* at 8-9. Specifically, Emerald reported that it had spent more than \$10 million for the design and installation of a sodium hydrosulfide (NaSH) unit, which uses the exhaust gas stream from MBT production that had been sent to a flare. *Id.* at 9. Emerald also cites a labor dispute that disrupted production for more than seven months and the recent recession as reasons that it has lacked capital for projects of this nature. *Id.*

### **New Production Methods and Technologies**

Although the Agency’s initial recommendation disputed economic reasonableness, the Agency did not press Emerald to reexamine every alternative it had presented. Instead, the Agency focused on the investigation of new production methods and technologies that generate less ammonia in Emerald’s discharge and specific treatment technologies. Rec. at 22-23. In its initial suggested conditions, the Agency identified the following specific methods and technologies: (1) Fenton’s reagent treatment; (2) photo assisted Fenton systems; (3) hydrogen peroxide/UV treatment; (4) granular activated carbon treatment of the PC tank wastewater before combination with non-PC tank wastewater followed by biological nitrification; (5) spray irrigation on crops; and (6) dilution of wastewater from the PC tank with Illinois River water. Rec. at 23. Under the joint recommended conditions, Emerald would be obligated to investigate

only the last three, which Emerald and the Agency proposed as Conditions (D), (E), and (F). Joint Rec. Conds., Exh. B at 1. The Board notes that joint recommended condition (C) would require Emerald generally to investigate new technologies and evaluate “implementation of new and existing technology based on current plant conditions.” *Id.* The three specific investigations included in the joint recommended conditions are discussed in detail in the following subsections.

**Granular Activated Carbon.** The Agency argues that Emerald has not thoroughly considered granular activated carbon treatment of the PC tank wastewater before combination with non-PC tank wastewater followed by biological nitrification. Rec. at 15. The Agency further argues that USEPA “guidance indicates that this treatment alternative effectively removes inhibitors, including MBT, which then allows for biological treatment.” *Id.*

The Board notes that in AS 02-5, Noveon’s evaluation of treatment technologies considered powdered and granulated activated carbon but determined that both would be infeasible.

At hearing, Mr. Flippin testified that Noveon considered powdered and granulated activated carbon (GAC) as ammonia treatment alternatives, but determined that both would be infeasible. Mr. Flippin stated that Noveon’s discharge would require a dose of 5,000 mg/L of powdered activated carbon. A dose proportional to the actual flow would total approximately 17 tons a day of carbon. Mr. Flippin stated that GAC is about twice as efficient, but would still require as much as eight and a half tons per day, or approximately 119,000 tons of the material per week. 2004 Tr. at 490-91. Implementation of this alternative would require additional treatment such as a solids separation step or a polymer addition. Two additional problems that arise from using GAC as an alternative are scaling, resulting from too much salt, and biofouling from lime and biomass as a result of too much BOD. 2004 Tr. at 492. Noveon, slip op. at 12-13 (November 4, 2004).

The Board notes that the agreed recommended condition (D) would focus a study of activated carbon use to just the PC tank wastewater before it combines with the non-PC tank wastewater. In addition, the agreed recommended condition requires, “[t]he study shall include a technical feasibility evaluation and an economic feasibility analysis.” Joint Rec. Conds. Exh. B. Emerald stated that it “can complete such a study.” Oct. Resp. at 7. However, the Board notes that the recommended condition did not include a deadline to complete the study. The Board concludes that Emerald should complete its investigation as quickly as possible in order to allow the Agency to determine whether the alternative is economically reasonable and technically feasible, especially in light of anticipated revisions to the total ammonia nitrogen water quality standards. The Board notes that the Agency plans to proposed rules updating that standard in its next triennial review. The Agency notes that revised standards may lead to revisions in Emerald’s NPDES permit. Agency Resp., Exh. 1 at 4-6. In light of these factors, the Board will require Emerald to complete its investigation within three years of the effective date of this adjusted standard. By doing so, the Board notes that the Agency will have available information about relevant treatment alternatives when implementing revised ammonia standards.

**Spray Irrigation on Crops.** The Agency proposed that “the nitrogen in Emerald’s effluent could be of agronomic benefit through spray irrigation on crops.” The Agency stated that Emerald had failed to evaluate land application as an alternative. Rec. at 15. Emerald responded that spray irrigation would only be feasible when the ground is able to absorb the water. Emerald added that farmers may be reluctant to use wastewater for spray application because of the presence of other constituents that might have a detrimental impact on the land or crops. However, Emerald agreed that it could investigate this option. Oct. Resp. at 7.

The Board recognizes Emerald’s reservations regarding spray irrigation but also recognizes Emerald’s agreement that it is able to investigate this option. The Board expects that this investigation can address ammonia as a nutrient resource for irrigation on crops and other planted areas. Such alternatives may be investigated even if only to provide a seasonal or partial reduction in Emerald’s contribution of ammonia to the Illinois River. As with investigation of granular activated carbon, the Board will include this agreed condition with a three-year deadline to complete this investigation.

**Dilution of Wastewater from PC Tank with Illinois River Water for Single-Stage Nitrification.** The Agency’s proposed conditions include a requirement that “Emerald investigates and submits a study to Illinois EPA on the dilution of waste water from the PC tank with water from the Illinois River.” Rec. at 23. The Agency explained that this approach intends “to dilute the concentration of MBT to a level that would not inhibit nitrification in the treatment plant.” Agency Resp. at 7. The Agency notes that average flow rates from the PC tank and C-18 tank decreased from 2002 to 2011 by 38 gallons per minute (33.6%), which provides capacity to introduce Illinois River water, dilute MBT, and allow single-stage nitrification. Rec. at 9, 15-16, citing Exh. 13 at 2. The Agency argues that, since dilution would take place within the plant and not at the outfall solely to meet effluent limits, “it would be allowable under 35 Ill. Adm. Code 304.102(b) [Dilution].” *Id.*

Emerald noted that Noveon previously considered this option in AS 02-5. However, Brown and Caldwell did not re-evaluate it in its 2013 report. The report stated that “[n]itrification 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.” Appendix A at 5; *see Noveon*(May 22, 2002) (petition at 22). Brown and Caldwell also addressed diluting the primary and secondary clarifier effluents, but found that bio-inhibition continued to prevent nitrification even after a 16-fold dilution of the primary clarifier effluent and 5-fold dilution of the secondary clarifier effluent. Appendix A at 4.

Addressing biological nitrification of the combined wastewater, Emerald explained that it would reduce the pH of the PC tank discharge and add river water. The waste stream would then be combined with the non-PC wastewater to allow for single-stage nitrification. Pet. at 26. Emerald cited a lack of reliability because of variability in the wastewater characteristics caused by different batch processes at the facility. Emerald emphasized that reliability is necessary to demonstrate consistent compliance. Pet. at 26.

Because of these issues, Emerald responded to the Agency's recommendation by stating that the option would not be viable. Oct. Resp. at 7. Emerald also addressed the Agency's apparent view that this option would use capacity created by decreased flows. Emerald replied that the option would interfere with future plans to increase capacity and production at the plant. Oct. Resp. at 7.

In the agreed recommended conditions, however, Emerald agreed to study dilution of the wastewater to determine the potential for subsequent single-stage nitrification. As a part of the study, Emerald agreed to include an evaluation of the technical feasibility and economic reasonableness. Joint Rec. Conds., Exh. B (Condition F).

The Board notes that, in AS 02-5, Noveon listed the costs of this alternative in terms of present worth costs at \$4.4 million in capital costs and \$7,310,000 in O&M costs, for a total present worth of \$11,710,000. Noveon (May 22, 2002) (petition at 22); *id.* (Exhibit 7 at 3). The Board notes that these costs made it one of the most expensive alternatives that Noveon evaluated in AS 02-5.

Brown and Caldwell previously stated that biological nitrification of the combined wastewater stream was technically feasible but presented problems with reliability. Pet. at 26; Noveon (May 22, 2002) (petition at 22). The Board also notes that the record does not establish the relationship between MBT concentrations and inhibition of nitrification. The record does not establish the MBT concentration at which nitrification could allow the facility to meet the 3.0 mg/L ammonia effluent limit or an alternative limit. Also, the record does not show the costs for this alternative in terms of percentage removal. The Board will include this agreed condition with a three-year deadline to complete the investigation.

**Summary.** As agreed upon by Emerald and the Agency, the Board will include conditions requiring Emerald to investigate the technical feasibility and economic reasonableness of granular activated carbon, spray irrigation on crops, and dilution of wastewater from the PC tank with Illinois River water for single-stage nitrification. In addition, the Board will require Emerald to complete its investigation of these alternatives within three years of the date on which it grants this adjusted standard.

### **Reduction in Effluent Limit Concentration**

The Agency's recommendation noted that none of technologies evaluated by Emerald would result in compliance with the generally applicable standard. Rec. at 10. The Agency asserted that "Emerald should still provide incremental reductions in ammonia even though it would fail to meet the prescribed 3 mg/L limit in section 304.122." *Id.*

The Agency's proposed conditions included a requirement that Emerald reduce ammonia in its effluent by 48%. Rec. at 22. According to Brown and Caldwell's 2013 report, effluent ammonia NH<sub>3</sub>-N waste loads decreased by 48% in 2011 from 2002 levels, while effluent flow rates decreased by about 4%. Brown and Caldwell attributed the decrease to shut downs, lower production, and improved recovery. Appendix A at 2. More specifically, Brown and Caldwell stated that

[t]hese decreases are principally due to lower COD and TKN loads being discharged through the PC Tank to the influent to the WWTF. This reduction has been attributed to the shutdown of X70 and Geltrol, much lower production of OBTS (2 months every 3 months versus weekly before), much lower production of C-18 (2 weeks every quarter versus monthly before) and improved recovery in the tertiary butyl amine (TBA) column. *Id.*

The Agency proposed that “Emerald’s effluent limit for ammonia nitrogen be reduced by 48% from 155 mg/l to 80 mg/l to reflect 48% reduction in the effluent waste load.” Rec. at 22.

Emerald responded by pointing out that, although the Brown and Caldwell report noted a 48% decrease in NH<sub>3</sub>-N waste loads from 2002 to 2011, the decrease was due mainly to temporary shutdowns and lower production. The report also noted that “Emerald is in the process of regaining total production levels previously observed in 2004. As production increases, the effluent flow rate, NH<sub>3</sub>-N load, and effluent NH<sub>3</sub>-N concentration are expected to increase.” Appendix A at 2.

Emerald stated that it could not accept the Agency’s proposed 48% reduction but would evaluate historic data to propose an alternative reduction in the effluent limitation. Oct. Resp. at 6. Emerald’s current NPDES Permit establishes a daily maximum effluent limitation of 155 mg/L and a daily maximum load limit of 1,848.6 lbs/day for ammonia (as N). Pet. Exh. 3 at 5. Based on data from January 1, 2007 to January 31, 2012, Emerald stated the concentration of ammonia-nitrogen in Henry Plant’s discharge ranged from 23 to 150 mg/L. Pet at 16, 19; Exh. 10. Data from 2011 indicate that the peak daily waste load was 1449 lbs/day. Emerald suggested that the maximum daily load limit for ammonia in the NPDES permit could be reduced from 1,848.6 to 1,500 lbs/day to reflect the progress made by Emerald in reducing effluent ammonia to reflect the highest daily load experienced in 2011. Apr. Resp. at 3.

In the joint recommended conditions, Emerald and the Agency proposed a daily maximum effluent limitation of 140 mg/L and a maximum daily load limit of 1,633 lbs/day ammonia (as N). Joint Rec. Conds. at 2. Although not required by the current NPDES permit, Emerald and the Agency also proposed adding a 30-day average effluent limit of 110 mg/L and a 30-day average load limit of 841 lbs/day. The daily maximum load limit and 30-day average load limit are based on a daily maximum flow rate of 1.4 MGD and a daily average flow rate of 0.917 MGD listed in Emerald’s 2007 NPDES permit. Pet. Exh. 3, Joint Rec. Conds. at 2.

The Board notes that the jointly-proposed 140 mg/L daily maximum effluent limitation represents a 10% decrease from the current 155 mg/L. The Board further notes that the 1,633 lbs/day maximum daily load limit reflects a 12% decrease from the current 1848.6 lbs/day daily maximum load limit. Likewise, the 30-day average effluent limit of 110 mg/L and load limit of 841 lbs/day are 29% and 55% less, respectively, than the currently permitted daily maximum rates in the NPDES permit. While Emerald initially opposed a 48% reduction in the daily maximum effluent limit proposed by the Agency, Emerald subsequently agreed to ammonia nitrogen discharge limitations in terms of 30-day average effluent and load limits as a condition of the requested relief. Oct. Resp. at 6, Joint Rec. Conds. at 2.

The Board will include the jointly-agreed ammonia nitrogen limits and load limits as conditions of the adjusted standard. In this regard, the Board notes that the jointly-agreed 30-day average effluent limit of 110 mg/L and the load limit of 841 lbs/day would be additional limits not imposed in the facility's current NPDES permit. While a 48% reduction in the waste load observed between 2002 and 2011 was due to temporary shutdowns and lower production, Emerald will be required to comply with the effluent limitations even if it returns to higher production levels.

### **Additional Condition**

Emerald has already implemented strategies to reduce discharge of ammonia to its wastewater treatment plant, including replacement of the BBTS Wet Scrubber with a dust collector, incorporating ammonia reduction as a metric in the employee gain sharing plan, and upgrading instrumentation around the acetonitrile recovery column. Exh. 6 at 1-2, 7, 9, Apr. Resp. at 4-7.

In addition, Emerald agreed to reduce its daily maximum effluent and load limits. Joint Rec. Conds. at 2. However, the Board notes that, even with the reductions, Emerald's requested effluent limitations of a daily maximum of 140 mg/L and a 30-day average of 110 mg/L remain well above the 3 mg/L effluent limitation in 35 Ill. Adm. Code 302.122(b).

In AS 02-5, Noveon's Health and Safety Manager David Griffin stated that, "in light of all the above source reduction and end-of-pipe activities conducted by the plant, the plant has determined that there is no silver bullet that will allow its wastewater treatment system to comply with the three milligram and six milligram ammonia standard. . . ." Noveon (Feb. 17, 2004) (transcript at 41).

The facility has investigated reducing ammonia in its effluent since BF Goodrich Corporation first filed an NPDES permit appeal (PCB 91-17) and variance petition (PCB 92-167). Pet. at 3. Although the facility may find no silver bullet to bring Emerald's discharge into compliance with the generally applicable effluent limit of 3.0 mg/L, the Board notes that the Henry Plant has reduced ammonia discharges through a combination of strategies.

In AS 02-5, the Board stated that, "[t]hroughout the duration of this adjusted standard, the Board encourages Noveon to research and propose means, beyond the wastewater treatment plant and multi-port diffuser, of providing environmentally beneficial improvements to the Illinois River in Marshall County." Noveon slip op. at 19 (Nov. 4, 2004). As noted in AS 02-5, the Board has granted adjusted standards incorporating voluntary environmental projects. *Id.*, citing 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 (Sept. 7, 2000); Petition of City of Rock Island for an Adjusted Standard from 35 Ill. Adm. Code 304, AS 91-13 (Oct. 19, 1995); Petition of City of East Moline and IEPA for an Adjusted Standard from 35 Ill. Adm. Code 304, AS 91-9 (May 19, 1994). In AS 99-6, the Board found that the adjusted standard and 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 (Oct. 18, 2007). The Board also granted the adjusted standards in AS 91-9 and 99-13 indefinitely as long as the petitioner met conditions including maintaining the benefit of the environmental project.

In AS 02-5, the Board stated that, if Emerald requests renewal of the adjusted standard, it would consider projects proposing improvements to the Illinois River in Marshall County. Noveon, slip op. at 19 (Nov. 4, 2004). Since Emerald seeks renewal, the Board's August 1, 2013 Hearing Officer Order requested that Emerald provide information on any environmental projects. Emerald responded that it had not yet completed and was not planning any such projects. Emerald stated that is "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." April Resp. at 8-9.

The order also asked Emerald to comment on a condition requiring it to implement and maintain a nonpoint source BMP addressing ammonia if it sought to continue to rely on dilution under 35 Ill. Adm. Code 304.102. Emerald responded that it did not now view consideration of such a project to be realistic and argued that it has "negligible" ability to affect non-point source pollution from agriculture. Oct. Resp. at 10. Emerald argued that evaluating new treatment technologies and production methods would be more productive than implementing and maintaining a non-point source BMP. *Id.* at 9.

The Board also asked Emerald if it "would consider cost-share incentives to implement or install best management practices (BMP) 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 on the Agency's website. Emerald responded that it was not likely to consider such options because of the funds needed for such a project. Emerald added that there is a lack of identified BMPs for reduction of nitrogen discharges from non-point sources, and it has not found any that would be "economically feasible or result in a quantifiable environmental benefit." Oct. Resp. at 11.

The Agency stated that, if the Board grants Emerald's requested relief, it "would not oppose a condition in Emerald's permit to implement and maintain non-point source best management practices to provide an environmental benefit that also addresses ammonia." Agency Resp. at 9. The Agency added that it "is unsure that Emerald will be able to find a sufficient number of nonpoint sources to off-set the high levels of ammonia in Emerald's discharge." *Id.*

On November 25, 2014, the Agency and Department of Agriculture issued a draft “Illinois Nutrient Loss Reduction Strategy” (Nutrient Strategy) for public comment.<sup>2</sup> The Nutrient Strategy sets a target of reducing nitrate-nitrogen loading to the Mississippi River by 15% by 2025 with an ultimate target of 45% reduction, as recommended by the USEPA Science Advisory Board and outlined in the Gulf Hypoxia Action Plan 2008.<sup>3</sup> Nutrient Strategy at 2.1.

The Nutrient Strategy identifies the “Illinois River-Senachwine Lake Watershed” as one of five priority watersheds in Illinois for both point sources and agricultural non-point sources of nitrate-nitrogen. Nutrient Strategy at 4.2-4.3. The Board notes that the Henry Plant discharges to the Illinois River just downstream of Senachwine Lake, which places the facility’s discharge within the Illinois River-Senachwine Lake Watershed. Noveon Pet. Exh. 3, Figure 1-2; Hearing Exh. 18; PCI.

The Nutrient Strategy addresses several nutrient reduction strategies, including agricultural BMPs. Some BMPs are cost negative, which means that agricultural producers would save money. Others cost \$1.38/lb nitrate-nitrogen removed or more. Nutrient Strategy at 3.30-3.33. The Board has stated that an environmental project can be “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). The Nutrient Strategy states that “Illinois EPA will promote trading or other offsets as part of watershed planning and implementation efforts and may use such trading when considering NPDES permits after an appropriate, enforceable, and transparent program has been developed.” Nutrient Strategy at 5.9. In 2017, the Agency intends to propose rules establishing nutrient water quality standards. Nutrient Strategy at 8.3.

The Board notes that the process sought by Emerald and the Agency to achieve nitrification of the ammonia in the facility’s discharge would convert the ammonia-nitrogen ( $\text{NH}_4^+$ ) into nitrite-nitrogen ( $\text{NO}_2^-$ ) and then into nitrate-nitrogen ( $\text{NO}_3^-$ ) for discharge into the Illinois River. See Noveon (Feb. 9, 2004) (Flippin testimony at 9-10). Nitrate-nitrogen is one of the targeted pollutants in the Illinois Nutrient Reduction Strategy for the Illinois River-Senachwine Lake Watershed.

Given the facility’s efforts to reduce ammonia-nitrogen in the effluent, the strength of the ammonia nitrogen discharge from the facility, and the location of its outfall into a priority watershed for sources of nitrate-nitrogen; the Board finds that a condition addressing offsets through BMPs is appropriate for providing relief from 35 Ill. Adm. Code 304.122(b) should Emerald seek to renew or modify the adjusted standard. The Board will include a condition

---

<sup>2</sup> See <http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index>

<sup>3</sup> Mississippi River/Gulf of Mexico Watershed Nutrient Task Force. 2008. Gulf hypoxia action plan 2008 for reducing, mitigating, and controlling hypoxia in the northern Gulf of Mexico and improving water quality in the Mississippi River Basin, Washington, DC.

requiring Emerald, if it seeks to renew or modify the adjusted standard, to implement agricultural BMPs to offset contributions from the facility's discharge of nitrogen to the Illinois River. This condition intends to provide a partial reduction in the nitrogen loading to the watershed. Consistent with the Nutrient Strategy's ultimate target of a 45% reduction in nitrate-nitrogen loadings, the condition provides that, if Emerald seeks to renew or modify this adjusted standard, it must implement agricultural BMPs within the Illinois River-Senachwine Lake Watershed to provide a partial reduction in the total nitrogen loading to the watershed by offsetting at least 45% of the nitrogen represented in 841 lbs/day ammonia-nitrogen based on the 30-day average load limit.

The Board recognizes that Illinois' nutrient strategy is in the early stages of implementation and that Emerald may be faced with other regulatory changes pertaining to total ammonia nitrogen water quality standards during the next few years. However, because the adjusted standard sunsets in five years, the Board firmly concludes that Emerald must begin planning to offset the nitrogen loading to the Illinois River. Based on the Nutrient Strategy's goals and deadlines, the Board expects that the Agency is planning to develop "an appropriate, enforceable, and transparent program" beyond the adjusted standard. The Board expects that this program will incorporate BMPs for agricultural non-point sources and a mechanism that Emerald could use to meet an offset such as that required in this order. Nutrient Strategy at e, 5-9, 8-3. Additionally, the Board stresses that the condition pertaining to BMPs does not supersede or offset requirements under the other conditions of the adjusted standard.

### **Best Degree of Treatment**

In AS 02-5, the Board described the concept of a mixing zone and its relationship to the prerequisite BDT.

Under the 'allowed mixing concept,' a discharger that is unable to comply with the requirements of not causing or contributing to water quality violations, 'after making every effort to fulfill the obligations of the discharger . . . and given the limits imposed by the nature of the receiving water body and the character of the outfall(s), is entitled to use a limited portion of the receiving body of water to effect mixing of the effluent with the receiving water. Within this limited portion of the receiving body of water, the discharger is excused from compliance with 304.105.'" Marathon Oil Co. v. IEPA, PCB 92-166 (Mar. 31, 1994).

\* \* \*

Depending on the Agency's permit decisions about the mixing zone, the permittee may use mixing as a means of compliance with the Board's water quality standards. *See* 35 Ill. Adm. Code 302.102(g), (h). Board regulations state that a mixing zone is available where the discharger has made every effort to comply with 304.102, which requires all dischargers to provide BDT. 35 Ill. Adm. Code 302.102(a). The regulations further provide that BDT must be consistent with technological feasibility, economic reasonableness and sound engineering judgment. 35 Ill. Adm. Code 304.102(a).

\* \* \*

The Board further finds in this order that Noveon qualifies for an adjusted standard from the ammonia effluent limit because no other alternative investigated is both technologically feasible and economically reasonable. Thus, the Board finds that Noveon meets the threshold requirement for a mixing zone and ZID by providing BDT at the Henry Plant. Noveon, slip op at 19-20 (Nov. 4, 2004).

The Board notes that the facility has achieved reductions of ammonia in its effluent through a combination of strategies. Emerald has not indicated it intends to discontinue any of these strategies, including the high-rate, multi-port diffuser; use of the BBTS Wet Scrubber in place of a dust collector (Exh. 6 at 1-2, Apr. Resp. at 4); incorporation of ammonia reduction as a metric in the employee gain sharing plan (Pet. Exh. 6 at 7, Apr. Resp. at 5-6); or upgrading instrumentation for the acetonitrile recovery column (Pet. Exh. 6 at 1, 9, Apr. Resp. at 7).

Based on Brown and Caldwell's 2013 re-evaluation of alternatives and the investigation of newly-demonstrated treatment technologies, the Board again finds after additional consideration that no investigated alternative beyond those already implemented at the facility is both technologically feasible and economically reasonable. The Board finds that Emerald's multi-faceted approach provides the best degree of treatment at the facility. The Board further finds that this approach is consistent with the provisions for technological feasibility, economic reasonableness and sound engineering judgment in 35 Ill. Adm. Code 304.102(a) pursuant to the requirements of 35 Ill. Adm. Code 302.102(a).

However, in addition to the joint recommended conditions, the Board will add two conditions, one of which requires Emerald to maintain the high-rate, multi-port diffuser for the discharge. The second additional condition requires Emerald to maintain use of the BBTS Wet Scrubber in place of a dust collector; the incorporation of ammonia reduction as a metric in the employee gain sharing; and the upgrade of the instrumentation for the acetonitrile recovery column. The Board considers these additional conditions necessary for Emerald to continue to meet the requirement of providing BDT as a prerequisite for a mixing zone and ZID.

In AS 02-5, the Board found that Noveon provided BDT at the facility, but the Board's determination hinged on the sunset date of the adjusted standard. The Board stated that it

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. Noveon, slip op. at 21 (Nov. 4, 2004).

In this case, the Board provides that the adjusted standard and determination of BDT terminate five years from the effective date of this order. *See* Joint Rec Conds. at 4 (recommending 10-year termination). The Board notes that, over five years, Emerald will have the opportunity to investigate and evaluate strategies for reduction of ammonia-nitrogen discharged to the Illinois River. Also, the Agency will have the opportunity to propose revisions to the total ammonia nitrogen water quality standards based on USEPA's 2013 update of the

ammonia water quality criteria. As the Agency stressed, revised standards may lead to revisions in Emerald's NPDES permit. Agency Resp. Exh. 1 at 4-6. Additionally, as discussed above under "Additional Condition," other issues may generate additional Agency proposals to amend nutrient water pollution regulations. Within the next five years, Emerald must adapt its strategies to any requirements adopted through those amended rules. If Emerald seeks to renew or modify the adjusted standard, revisiting Emerald's discharge and treatment after five years will be beneficial.

As discussed above, the Board found that factors relating to Emerald are substantially and significantly different from the factors relied upon by the Board in adopting the generally applicable regulation. Because its existing wastewater treatment plant is inhibited from nitrifying ammonia, Emerald has investigated alternative strategies for reducing ammonia in its effluent. The Board has carefully reviewed the record and noted above that comparing Emerald's facility with POTWs does not accurately reflect Emerald's treatment options in terms of cost, size, or complexity. The Board has also noted that the facility's wastewater discharge differs substantially and significantly from the discharge of other industries. . The Board finds that the existence of the substantially and significantly different factors described above justifies the requested adjusted standard.

**Impact on the Environment or Health (415 ILCS 5/28.1(c)(3))**

**Emerald**

Emerald argues that granting the requested adjusted standard would have "no measurable impact upon the environment or human health." Pet. at 34. Emerald further argues that the facility's discharge "will meet the winter and summer acute water quality standards for total ammonia nitrogen as N at the edge of an appropriately calculated ZID." *Id.*, citing *id.* at 19-20 (describing discharge). Emerald asserts that "winter and summer acute and chronic standards will also be met at the edge of an appropriately calculated mixing zone." *Id.* at 34-35, citing *id.* at 19-20. Emerald concludes that "the impact will not be significantly more adverse than that contemplated by the regulation of general applicability." *Id.* at 35.

In a hearing officer order, the Board stated that it had ordered Noveon "to demonstrate compliance with the applicable ammonia water quality standards at the edge of the mixing zone and ZID, as will be defined by the Agency." Noveon, slip op. at 18-19 (Nov. 4, 2004). The Board asked Emerald to provide additional information on the ZID and mixing zone approved by the Agency, including their dimensions.

Emerald responded that its NPDES permit does not specify the dimensions of a ZID or mixing zone, which will vary with the flow in the Illinois River. April Resp. at 10. Emerald states that, after field work, modeling, and permitting, it installed a new multi-port diffuser for discharge of treated effluents. *Id.* The diffuser "was designed to provide a dispersion of at least 11:1 to meet the most stringent of the acute ammonia standards based on data at the time and 99:1 to meet the most stringent of the chronic ammonia standards based on data at the time." *Id.* Emerald reported that "[t]esting of the diffuser showed a dispersion of 39.78:1 at a distance 20 feet downstream from the diffuser. This exceeds the dispersion required to meet the acute standard within a short distance." *Id.* Testing also showed that "dispersion of 299.9:1 was

achieved at 1,090 feet from the diffuser. This more than exceeds the dispersion required to meet the chronic ammonia standard.” *Id.*; *see* Pet., Exh. 4 at 3-14 (Table 3-8).

In response to a Board hearing officer order, Emerald employed a more recent Agency database and the Agency’s current methodology to calculate updated ammonia standards and required dispersions. April Resp. at 13 (Table A). Emerald states that it followed the Agency’s recommendation to use median or 50th percentile values of pH in determining ammonia standards. *Id.* Emerald explains that its dispersions are based on the combined Emerald/PolyOne effluent of 1 million gallons per day (mgd) and the City of Henry POTW effluent of 0.3 mgd with an effluent ammonia concentration of 126 mg/L. *Id.* Emerald also states that the dispersions are based on meeting the Early Life Stage Present criteria, which will also meet the Early Life Stage Absent Criteria. *Id.*

Emerald states that the acute ammonia standard does not reflect a seasonal change. *Id.* Based on background pH, “[t]his translates to an acute ammonia standard of 6.62 mg/L.” April Resp. at 13. Emerald further states that the diffuser test shows that the dispersion of 19.2:1 required to meet this standard was met within 20 feet of the diffuser. *Id.* Emerald states that the chronic standard is based on temperature and time of year, for each of which there is a different equation for calculating the proper standard. *Id.* Emerald argues that “the critical dispersion required is 121.2:1.” *Id.* Emerald argues that, because dispersion of 299.9:1 was measured 1,090 feet from the diffuser, “all chronic standards are met.” *Id.*

Emerald stated that its multi-port diffuser is designed to discharge toward the surface. April Resp. at 11. Emerald reported that, during diffuser testing, data from the edge of the ZID “showed that the main portion of the plume extended from the surface or near the surface to 5 feet below the water surface, with dye concentrations falling off significantly to 8 feet below the water surface.” *Id.* Emerald stated that, while the acute toxicity standard for mussels was met at the edge of the zone of initial dilution 20 feet downstream, there was little to no effluent in the water column along the bottom waters. *Id.* Emerald added that the actual ZID, where effluent is mixed top to bottom, extends approximately 99 feet downstream from the discharge. Emerald claimed that this is “the plume’s first opportunity to impact the macro-invertebrates in the Illinois River.” *Id.*

Emerald states that its diffuser minimizes the mixing area and volume so that “the plume area is less than 1.5 acres versus 26 acres allowed by the Illinois regulations.” April Resp. at 11. Emerald argues that its “mixing zone is very small compared to the area of the Illinois River in this reach of the river.” *Id.*

The Board asked Emerald to indicate how it demonstrates compliance with the applicable ammonia nitrogen water quality standards at the edge of the ZID and mixing zone. Emerald states that it relies on a third party to conduct quarterly sampling. April Resp. at 11. AquaEter prepared guidance documents for this sampling. Pet., Exh. 5. Emerald states that it has provided results of this monitoring to the Agency through annual reports. April Resp. at 11, citing Pet., Exh. 6. Emerald concludes that it met the ammonia nitrogen standard for its effluent at the edge of the ZID in all years. April Resp. at 12, citing Att. 3 (sampling results).

Agency

The Agency notes Emerald's argument that granting the requested adjusted standard will cause "no environmental or health impact because the discharge will not cause the winter and summer acute ammonia nitrogen water quality standards to be exceeded at the edge of the zone of initial dilution (ZID), or the winter [and] summer acute and chronic standards at the edge of the mixing zone." Rec. at 19; *see* Pet. at 34-35.

The Agency states that "Draft 2009 Update Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater, EPA-822-D-09-001 includes previously unavailable mollusk toxicity data in criteria derivation and concludes that acute and chronic criteria must be lowered by approximately a factor of five over the previous national criteria for ammonia published in 1999 in order to protect mollusks." Rec. at 19-20. Based on draft guidance, the Agency states that "the Emerald effluent will require more mixing than is available in the Illinois River to be protective of mollusks." *Id.* at 20. The Agency argues that, if USEPA adopts the draft criteria, state standards must be amended to match them. *Id.* at 20. The Agency states that,

under 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 the 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. This mixing follows the demonstrated 47.9:1 dilution in the ZID based on Emerald's high rate diffuser modeling and 300:1 dilution in the mixing zone per Section 301.102 in the mixing zone (25% of 7Q10 flow<sup>4</sup>). *Id.*; *see* Agency Resp. Exh. 1 at 2-3, citing 35 Ill. Adm. Code 302.212(b)(1), (b)(2)(A)(ii) (equations to calculate acute and chronic standards).

The Agency stated that these effluent concentrations are water quality based effluent limits. Agency Resp. Exh. 1 at 4.

Asked by the Board to indicate the pH and temperature values used to calculate these standards, the Agency responded that

[t]he 75th percentile pH value for spring and fall months resulting in an acute water quality standard of 5.2 mg/L total ammonia and a daily maximum permit limit of 249.5 mg/L total ammonia is 8.25 SU. The 75th percentile pH and temperature values for summer months resulting in a chronic water quality standard of 0.8 mg/L total ammonia and a monthly average permit limit of 213.7 mg/L are 8.08 SU and 27.5 degrees Celsius, respectively. Agency Resp. Exh. 1 at 2.

---

<sup>4</sup> "7Q10 flow" refers to the average seven-day low flow occurring once every ten years. *See* 35 Ill. Adm. Code 375.203(b)(2).

The Agency reported that it obtained these pH and temperature values from data it collected “at Ambient Water Quality Monitoring Network station D-09, Illinois River at Lacon during the period 2006 through 2010.” *Id.*

In a hearing officer order, the Board noted that Emerald had relied on a 50th percentile background pH of 8.125 and temperature of 23.30° C to calculate “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.” Agency Resp. Exh. 1 at 2. Asked to comment on these values, the Agency responded that its “calculations follow 35 Ill. Adm. Code Part 355.203(a) whereby the 75th percentile pH and temperature data from the receiving stream are used to calculate water quality standards for ammonia and hence permit limits.” *Id.* The Agency states that Emerald was incorrect to rely on the 50th percentile pH and temperature in its calculations. *Id.*

In its recommendation, the Agency claimed that “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.” Rec. at 20. The Agency suggests that, because current effluent concentrations exceed these levels, there is a basis to “conclude that the effluent could be causing harm to mollusks in the Illinois River.” *Id.* Relying on the 2009 draft criteria document, the Agency argues that “relief from effluent concentrations believed to be harmful to mollusks after mixing must not be allowed.” *Id.*

In its response to a Board hearing officer order, the Agency clarified that USEPA adopted a final version water quality criteria for ammonia in August 2013. Agency Resp. Exh. 1 at 4, 6. The Agency stated that “[t]he acute and chronic criteria are not as stringent as those in the 2009 draft. There is no longer a ‘mussels present and mussels absent’ dichotomy in the final version.” *Id.* Employing USEPA criteria and the pH and temperature values reported above, the Agency stated that “the spring/fall acute water quality criterion is 2.2 mg/L and the summer chronic water quality criterion is 0.4 mg/L.” *Id.* at 4-5. Applying the USEPA criteria to the ZID, the daily maximum permit limit would be 102.8 mg/L. *Id.* at 5 (showing calculation). Applying the USEPA criteria to the mixing zone, the monthly average summer permit limit would be 106.9 mg/L. *Id.* (showing calculation). The Agency determined that, using USEPA criteria, current Part 355 implementation rules, and dilution ratios of 47.9 for the ZID and 300:1 for the mixing zone, Emerald would have a spring/fall daily maximum of 102.8 mg/L and 30-day average of 120.5 mg/L, a summer daily maximum of 69.0 mg/L and 30-day average of 106.9 mg/L, and a winter daily maximum of 324.8 mg/L and 30-day average of 343.2 mg/L. *Id.* at 6. The Agency stated that, because “the 30 day average limits are all lower than the daily maximum limits, the permit would contain only daily maximum limits.” *Id.*<sup>5</sup>

Responding to a Board hearing officer order asking when the Agency seeks to propose to update the state ammonia standards, the Agency expressed “the understanding that under the Clean Water Act, states have one Triennial Review period in which to adopt as state standards published USEPA national criteria as just finalized for ammonia.” Agency Resp. Exh. 1 at 6. Asked how adoption of such criteria may affect an adjusted standard if granted, the Agency replied that, “[i]f Illinois adopts the new ammonia water quality standards identical to the

---

<sup>5</sup> The Board notes that the 30-day average limits appear to be higher than the daily maximums presented by the Agency. Agency Resp. Exh. 1 at 6.

national criteria and uses the existing Part 355 implementation rules, the above daily maximum permit limits would be required in Emerald's NPDES permit regardless of any relief granted." *Id.* at 7. The Agency added that it did not then know whether it would propose that the Board adopt the criteria or whether Part 355 properly implements the criteria. *Id.* The Agency states that it "intends to study the issues and develop a plan for an upcoming general rulemaking, including holding stakeholder workgroups." *Id.*

Addressing WET testing, the Agency indicates that substances in Emerald's effluent other than ammonia may also be toxic to aquatic life. Rec. at 20. The Agency notes that WET testing of the Emerald effluent on January 23, 2012, "found that the LC50 was <6.25% effluent for fathead minnows, a standard test organism." *Id.*; see Agency Resp. Exh. 1 at 1. Without an exact LC50 value derived from the January 23, 2012 sample, the Agency argues that "[t]he Emerald effluent may have been more toxic than the available dilution (47.9:1) in the ZID could render non-toxic." Rec. at 21.

The Agency argues that Emerald has available options to lower the ammonia nitrogen concentration in its effluent but has failed to do so. Rec. at 21. The Agency further argues that, because Emerald is not providing the best degree of treatment, it is not eligible for a mixing zone. *Id.*; see 35 Ill. Adm. Code 304.102. The Agency "encourages the Board to require Emerald to at least implement some ammonia reductions rather than granting the relief requested by Emerald." Rec. at 21.

The Agency concludes that "Emerald has failed to meet its burden of proof under Section 28.1(c)(3) of the Act. Rec. at 21, citing 415 ILCS 5/28.1(c)(3) (2012).

### **Discussion**

In AS 02-5, the Board included a condition requiring the facility to demonstrate compliance with the applicable ammonia nitrogen water quality standards at the edge of the ZID and mixing zone and to monitor ammonia nitrogen in the Illinois River on a quarterly basis. Pet. at 6; see Noveon, slip op. at 22 (Nov. 4, 2004).

In this proceeding, Emerald has presented evidence that the facility complies with the ammonia water quality standards at the edge of a mixing zone established in the facility's NPDES permit. In its April response to the Board's hearing officer order, Emerald reported that the multi-port diffuser achieved the effluent dispersion necessary to meet both the acute and chronic water quality standards at the edge of the ZID and mixing zone. April Resp. at 10. Emerald relies on quarterly sampling by a third party to monitor compliance. See Pet., Exhs. 5, 6. Emerald asserts that it has submitted to the Agency monitoring results showing that its effluent complies with the ammonia water quality standards at the edge of the ZID and mixing zone in all years. See April Resp. at 11-12, Exh. 3 (sampling results at diffuser); Pet., Exh. 6 (annual reports). The Board notes that there has been no change to the ammonia nitrogen water quality standards applicable to Illinois River at the facility since 2002. 35 Ill. Adm. Code 302.212 (Total Ammonia Nitrogen); see 26 Ill. Reg. 16931 (Nov. 22, 2002), eff. Nov. 8, 2002. As the Agency has noted, new ammonia water quality standards may need to be reflected in Emerald's permit regardless of relief granted. See Agency Resp. Exh. 1 at 6-7.

In addition, Emerald has argued that the generally applicable ammonia nitrogen effluent standard from which it seeks an adjusted standard is intended in part to address sags in DO concentrations. *See* Pet. at 33. Emerald states that data reported by the USGS show that DO concentrations in the Illinois River both upstream and downstream from the facility meet the DO water quality standards. April Resp. at 1.

In submitting joint recommended conditions, Emerald and the Agency stress that Emerald's NPDES permit will include requirements for both continued monitoring and WET testing. The joint recommended conditions also include a requirement that Emerald submit to the Agency annual reports on the performance and results of investigations into methods and technologies that may reduce ammonia in the facility's effluent.

Finally, the Board notes that the first joint agreed recommended condition would require that "Emerald's effluent limit for ammonia nitrogen is a daily maximum of 140 mg/L and 1633 lbs/day and a 30-day average of 110 mg/L and 841 lbs/day." This lowers the 155 mg/L maximum limit allowed under the adjusted standard granted by the Board in AS 02-5 and adds a daily maximum loading limit and 30-day average limits.

The Board concludes that the requested relief will not result in environmental or health effects substantially or significantly more adverse than those considered by the Board in adopting the generally applicable effluent standard.

#### Consistency with Federal Law

##### Emerald

Emerald asserts that "[t]here are no applicable federal numeric effluent standards or water quality standards for ammonia nitrogen as N." Pet. at 35. Emerald states that, under federal regulations, a water quality standard defines water quality goals by designating uses of the body of water and setting criteria necessary to protect the uses. *Id.* Emerald further states that, subject to USEPA review and approval, "[s]tates adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act." *Id.*, citing 40 C.F.R. §§ 131.2, 131.4(a). Emerald adds that state standards must protect designated uses and, where uses are not protected, offer technical and scientific support for failing to do so. Pet. at 35, citing 40 C.F.R. § 131.5(b). States can remove designated uses that have not come into existence only by showing that designated causes make it infeasible to attain that use. Pet. at 35, citing 40 C.F.R. § 131.10(g).

Emerald argues that granting the requested 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." Pet. at 36.

In a hearing officer order, the Board noted Emerald's claim that granting the adjusted standard would not impair any beneficial uses (Pet. at 36) and asked Emerald to address whether granting it could potentially impair any designated or existing uses. Emerald responded that the 303(d) list submitted to USEPA on December 20, 2012, shows the section of the Illinois River including the facility is "1) Fully Supporting Aquatic Life; 2) Not Supporting Fish Consumption; 3) Not Supporting Primary Contact; 4) Not Assessed for Secondary Contact; and 5) Not Assessed for Aesthetic Quality." April Resp. at 2, citing Att. 2 (Specific Assessment Information for Streams, 2012). Emerald states that "[t]he causes given for the impairments are mercury, polychlorinated biphenyls, and fecal coliforms. The sources of the impairments are listed as atmospheric deposition and sources unknown." April Resp. at 2, citing Att. 2.

The Board also asked whether any Illinois River sections affected by Emerald's discharge are listed on the Agency's current 303(d) list as impaired for ammonia or dissolved oxygen. Emerald responded that no sections of the Illinois River are listed as impaired for either of these causes. April Resp. at 2. Emerald argues that "[i]t is unlikely that Emerald's discharge would cause an impairment in the section into which it discharges, nor the segments downstream." *Id.* Emerald cites modeling by AquaEter showing DO "above 5 mg/L for the Illinois River downstream from the Emerald discharge for the most critical low-flow and high-temperature conditions." *Id.*

#### **Agency**

The Agency notes that Emerald must submit "adequate proof that the adjusted standard is consistent with any applicable federal law." Rec. at 21, citing 415 ILCS 5/28.1(c)(4) (2012); 35 Ill. Adm. Code 104.426(a)(4). Emerald states that, in AS 02-5, "the Board found that the adjusted standard was not inconsistent with federal law." Rec. at 21, citing Noveon, slip op. at 19 (Nov. 4, 2004). The Agency states that it "agrees." Rec. at 21.

#### **Discussion**

Emerald states that the requested relief is consistent with federal law, and the Agency agrees that there is no inconsistency between that requested relief and federal law. Accordingly, the Board finds that the record demonstrates that Emerald has presented adequate proof that its requested relief satisfies each of the Section 28.1 factors. The Board grants Emerald an adjusted standard from the Board's ammonia nitrogen effluent limit, subject to the conditions discussed in the following section of this opinion.

#### **ADJUSTED STANDARD LANGUAGE**

Having concluded above that Emerald has satisfied the four factors at Section 28.1(c) of the Act (415 ILCS 5/28.1(c) (2012)) and determined to grant Emerald relief from Section 304.122(b), the Board turns to the language of the adjusted standard. In granting an adjusted standard, "the Board may impose such conditions as may be necessary to accomplish the purposes of this Act." 415 ILCS 5/28.1(a) (2012); 35 Ill. Adm. Code 104.428(a). As noted above, while the Agency has continued to recommend that the Board deny the petition for an adjusted standard, Emerald and the Agency have agreed on recommended conditions that the

Board should impose if it determines to grant the requested adjusted standard. Below, the Board summarizes the agreed conditions and compares them to the conditions imposed by the Board in granting an adjusted standard in AS 02-5.

### **Effluent Limit**

In AS 02-5, the Board imposed a condition providing that the facility “must not discharge calculated total ammonia nitrogen at concentrations greater than 155 mg/L.” Noveon, slip op. at 22 (Nov. 4, 2004). Emerald’s petition proposed that the Board impose a condition maintaining this 155 mg/L limit. Pet. at 31. In its recommendation, the Agency proposed a condition requiring that “Emerald’s effluent limit for ammonia nitrogen be reduced by 48% from 155 mg/L to 80 mg/L to reflect the 48% reduction in the effluent waste load.” Rec. at 22.

As the first agreed recommended condition, the Agency and Emerald proposed to require that “Emerald’s effluent limit for ammonia nitrogen is a daily maximum of 140 mg/L and 1633 lbs/day and a 30-day average of 110 mg/L and 841 lbs/day.” Joint Rec. Conds. (Condition A); Exh. B (Condition A). The Agency and Emerald state that “[t]he daily maximum load limit and 30-day average load limit are based on a daily maximum flow rate of 1.4 MGD and a daily average flow rate of 0.917 MGD, respectively, as is listed in Emerald’s 2007 NPDES permit.” Joint Rec. Conds. at 2; *see* Pet., Exh. 2.

### **WET Testing**

While the Agency had proposed a second condition requiring Emerald to perform aquatic whole effluent toxicity tests (Rec. at 22), the Agency and Emerald agreed to withdraw it. Joint Rec. Conds. at 2. The Agency and Emerald reported agreement that “Emerald’s NPDES permit will contain the whole effluent toxicity testing requirements.” *Id.*

### **Quarterly Monitoring**

In AS 02-5, the Board imposed a condition requiring that the facility “must monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 Ill. Adm. Code 302.212.” Noveon, slip op. at 22 (Nov. 4, 2004). Emerald’s petition had not proposed a similar condition. *See* Pet. at 31-32.

While the Agency had proposed a third condition requiring that Emerald conduct quarterly monitoring of ammonia nitrogen (Rec. at 22), the Agency and Emerald agreed to withdraw it. Joint Rec. Conds. at 2. The Agency and Emerald stated that “Emerald’s 2007 NPDES permit and the renewal NPDES Permit that will be proposed following the conclusion of this proceeding will contain the monitoring requirements.” *Id.*

### **Investigation of Production Methods**

In AS 02-5, the Board imposed a condition requiring that the facility “must continue to investigate production methods and technologies that generate less ammonia” in its discharge.

Noveon, slip op. at 22 (Nov. 4, 2004). The condition provided that, when practicable, the facility “must substitute current methods or technologies with new ones so long as the substitution generates less ammonia.” *Id.* Emerald’s petition had not proposed a similar condition. *See* Pet. at 31-32. As the fourth condition, the Agency had proposed to require that “Emerald investigates new production methods and technologies that generate less ammonia in Emerald’s discharge.” Rec. at 22.

The Agency and Emerald reported that they had agreed on the following language to address this issue: “Emerald investigates new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald’s discharge. The nitrification inhibitors such as 2-Mercaptobenzothiazole (“MBT”) are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.” Joint Rec. Conds. at 2 (Condition D); Exh. B (Condition B).

#### **Investigation of Treatment Technologies**

As the fifth condition, the Agency proposed to require that “Emerald investigates new treatment technologies, including but not limited to Fenton’s reagent treatment, photo assisted Fenton system, hydrogen peroxide/uv treatment, and evaluates implementation of new and existing technologies based on current plant conditions.” Rec. at 22. The Board had not imposed a similar condition in AS 02-5, and Emerald had not proposed one. *See* Noveon, slip op. at 22-23 (Nov. 4, 2004); Pet. at 31-32.

The Agency and Emerald reported that they had agreed on the following language for this condition: “Emerald investigates new treatment technologies and evaluates implementation of new and existing technology based on current plant conditions.” Joint Rec. Conds. at 2 (Condition E); Exh. B (Condition C). The Agency and Emerald supported this condition by stating that “[t]here are constant advances in treatment technologies and considering the type of discharge and the length of the agreement, such an investigation would be beneficial.” *Id.* at 2-3.

#### **Study of Granular Activated Carbon**

As the sixth condition, the Agency proposed to require that “Emerald investigates and submits a study to the Illinois EPA on the use of granular activated carbon column of the PC tank waste water before the waste water combines with non-PC tank waste water, followed by biological nitrification.” Rec. at 22. The Board had not imposed a similar condition in AS 02-5, and Emerald had not proposed one. *See* Noveon, slip op. at 22-23 (Nov. 4, 2004); Pet. at 31-32.

The Agency and Emerald reported that they had agreed on the following condition:

Emerald investigates and submits a study to the Illinois EPA evaluating the use of granular activated carbon to treat the PC tank waste water before it combines with non-PC tank waste water to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment. The study shall include a technical feasibility evaluation and an

economic feasibility evaluation. Joint Rec. Conds. (Condition F), Exh. B (Condition D).

For the reason above, the Board will require Emerald to complete its investigation and study within three years of the effective date of this adjusted standard.

#### **Spray Irrigation**

As the seventh condition, the Agency proposed to require that “Emerald investigates and submits a study to Illinois EPA on the use of its effluent for spray irrigation on crops.” Rec. at 22. The Board had not imposed a similar condition in AS 02-5, and Emerald had not proposed one. *See Noveon*, slip op. at 22-23 (Nov. 4, 2004); Pet. at 31-32.

The Agency and Emerald reported that they had agreed on the following condition: “Emerald investigates and submits a study to Illinois EPA evaluating the technical feasibility and economic feasibility of a spray irrigation program. The feasibility determinations will include an evaluation of compliance with the applicable design standards for slow rate land application of treated wastewaters (35 Ill. Adm. Code: Subtitle C, Part 372).” Joint Rec. Conds., Exh. B (Condition E). The Agency argues “that the nitrogen in Emerald’s effluent could be of agronomic benefit through spray irrigation on crops, and Emerald has not previously evaluated land application of its waste stream as an alternative means to reduce ammonia discharges to the Illinois River.” Joint Rec. Conds. at 3 (Condition G). For the reasons above, the Board will include this agreed condition with a three-year deadline to complete the investigation and study.

#### **Dilution of Wastewater**

As the eighth condition, the Agency proposed to require that “Emerald investigates and submits a study to Illinois EPA on the dilution of waste water from the PC tank with water from the Illinois River.” Rec. at 22. The Board had not imposed a similar condition in AS 02-5, and Emerald had not proposed one. *See Noveon*, slip op. at 22-23 (Nov. 4, 2004); Pet. at 31-32.

The Agency and Emerald reported that they had agreed on the following condition: “Emerald investigates and submits a study to Illinois EPA evaluating the addition of water from the Illinois River to the wastewater in order to determine the potential for subsequent single-stage nitrification in light of the potential dilution. The study would include a technical feasibility analysis and an economic feasibility analysis.” Joint Rec. Conds., Exh. B (Condition F). The Agency argues “that Emerald may be able to achieve nitrification by dilution of waste water from the PC tank with water from the Illinois River.” Joint Rec. Conds. at 3 (Condition H). For the reasons above, the Board will include this agreed condition with a three-year deadline to complete the investigation and study.

#### **Annual Reports**

In AS 02-5, the Board imposed a condition requiring that the facility “must prepare and submit each year an annual report summarizing the activities and results of these investigatory

efforts.” Noveon, slip op. at 22-23 (Nov. 4, 2004). Emerald’s petition had not proposed a similar condition. *See* Pet. at 31-32.

As the ninth condition, the Agency proposed to require that “Emerald prepares and submits to the Illinois EPA annual reports summarizing its activities to comply with the above stated recommendations.” Rec. at 22. The Agency and Emerald stated that they agreed to this condition as originally proposed by the Agency. Joint. Rec. Conds. at 4 (Condition I); *id.*, Exh. B (Condition G).

#### **Modification of Relief**

The Agency and Emerald report that they had agreed to add a new recommended condition providing that, “[i]f, upon the review of the annual reports required by Paragraph G above, the Illinois EPA determines that new technology to treat ammonia is available that is economically reasonable and technically feasible, the Illinois EPA may petition the Board to modify the relief granted by the Board.” Joint Rec. Conds. (Condition J), Exh. B (Condition H).

#### **Sunset**

In AS 02-5, the Board imposed a condition that “[t]his adjusted standard will expire on November 4, 2011.” Noveon, slip op. at 22 (Nov. 4, 2004). Neither Emerald’s petition nor the Agency’s recommendation proposed a condition establishing a sunset date. *See* Pet. at 31-32; Rec. at 22-23.

The Agency and Emerald noted that the August 1, 2013 hearing officer order sought comment on a condition that would sunset requested relief in seven years. The Agency and Emerald concurred “that if the Board grants relief to Emerald that the requested relief be subject to the agreed upon conditions and that the relief terminate ten (10) years from the effective date of the Board Order granting such relief.” Joint Rec. Conds. at 4 (Condition K). However, the joint recommended conditions filed on June 17, 2014, do not include a sunset date. *See* Joint Rec. Conds., Exh. B.

As in AS 02-5, however, the Board includes a condition terminating this adjusted standard relief, although it changes that expiration from seven years to five years. Noveon, slip op. at 22 (Nov. 4, 2004). The Board’s order includes conditions requiring Emerald to conduct investigations and perform studies of various production and treatment options. During this five-year period, Emerald will also have the opportunity to examine any revisions to the ammonia water quality standards based on USEPA’s 2013 update of the ammonia water quality criteria, which may lead to revisions in Emerald’s NPDES permit. Additionally, Emerald will have the opportunity to assess its options under any proposed regulations for nutrient water pollution. Based on these factors, each of which may have a substantial impact on the facility’s discharge or permit, the Board concludes that a five-year sunset is appropriate and includes that as a condition on the relief granted below.

**CONCLUSION**

Pursuant to Section 28.1 of the Act (415 ILCS 5/28.1 (2012)), the Board grants Emerald relief from the ammonia effluent limit at 35 Ill. Adm. Code 304.122(b) at its facility at Henry, Marshall County. Emerald remains subject to the water quality limits at 35 Ill. Adm. Code 304.105 and the conditions included below in the Board's order. This adjusted standard relief is effective as of the date of this order.

This opinion and order constitutes the Board's findings of fact and conclusions of law.

**ORDER**

1. Pursuant to Section 28.1 of the Environmental Protection Act (415 ILCS 5/28.1 (2012)), the Board grants Emerald Performance Materials, LLC (Emerald) an adjusted standard from 35 Ill. Adm. Code 304.122(b). Under this adjusted standard, the total ammonia nitrogen effluent standard at 35 Ill. Adm. Code 304.122(b) does not apply to the discharge of effluent into the Illinois River from the Emerald facility at 1550 County Road 1450 N. in Henry, Marshall County. Instead, Emerald's effluent for total ammonia nitrogen must comply with a daily maximum of 140 milligrams per liter (mg/L) and 1633 pounds per day (lbs/day), as well as a 30-day average of 110 mg/L and 841 lbs/day. This adjusted standard takes effect on April 16, 2015, and expires on April 16, 2020.
2. The adjusted standard granted in paragraph 1 of this order is subject to the following conditions:
  - a. Emerald must continue to maintain the high-rate, multi-port diffuser for the discharge into the Illinois River to achieve an effluent dispersion necessary to meet the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and zone of initial dilution (ZID).
  - b. Emerald must maintain the following ammonia reduction measures: replacement of the BBTS Wet Scrubber with a dust collector; incorporation of ammonia reduction as a metric in the employee gain sharing plan; and upgrade of instrumentation for the acetonitrile recovery column.
  - c. Emerald must investigate new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald's discharge. The nitrification inhibitors such as MBT are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.

- d. Emerald must investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions.
- e. By April 16, 2018, Emerald must investigate and submit to the Illinois Environmental Protection Agency (Agency) the following studies:
  - i) A study evaluating the use of granulated activated carbon to treat the polymer chemicals tank waste water before it combines with non-polymer chemicals tank waste water to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment. The study must include a technical feasibility evaluation and an economic reasonableness analysis;
  - ii) A study evaluating the technical feasibility and the economic reasonableness of a spray irrigation program. The studies must include an evaluation of compliance with the applicable design standards for slow rate land application of treated wastewaters (35 Ill. Adm. Code 372); and
  - iii) A study evaluating the addition of water from the Illinois River to the wastewater to determine the potential for subsequent single-stage nitrification in light of the potential dilution. The study must include a technical feasibility evaluation and an economic reasonableness analysis.
- f. Emerald must prepare and submit to the Agency annual reports summarizing its activities to comply with paragraphs 2(c) through 2(e).
- g. If, upon review of the annual reports required by condition 2(f), the Agency determines that new technology to treat ammonia is available that is economically reasonable and technically feasible, the Agency may petition the Board to modify the relief granted by this order.
- h. If Emerald seeks to renew or modify this adjusted standard, Emerald must by the time it requests renewal or modification implement agricultural best management practices (BMPs) within the Illinois River-Senachwine Lake Watershed to provide a partial reduction in the total nitrogen loading to the watershed by

offsetting at least 45% of the nitrogen represented in 841 lbs/day ammonia-nitrogen based on the 30-day average load limit.

- i. Emerald must operate in full compliance with the Clean Water Act, its National Pollutant Discharge Elimination System permit, the Board's water pollution regulations, and any other applicable requirement.

IT IS SO ORDERED.

Board Chairman D. Glosser dissents.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2012); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motion for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on April 16, 2015, by a vote of 4-1.



---

John T. Therriault, Clerk  
Illinois Pollution Control Board

## **EXHIBIT 2**

ILLINOIS POLLUTION CONTROL BOARD  
December 1, 2016

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) )

OPINION AND ORDER OF THE BOARD (by J.D. O'Leary):

Emerald Performance Materials, LLC (Emerald) requested that the Board renew an adjusted standard previously granted to its chemical manufacturing facility located in Marshall County. *See* Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122, AS 02-5 (Nov. 4, 2004). Emerald sought to renew an adjustment from the total ammonia nitrogen as nitrogen effluent standard for discharge from the facility's wastewater treatment plant. *See* 35 Ill. Adm. Code 304.122(b). On April 16, 2015, the Board granted Emerald's petition subject to several conditions. Emerald appealed all or a portion of three conditions: agricultural best management practices (BMPs) to reduce of nitrogen loading, ammonia reduction as a factor in employee gain sharing, and a five-year sunset. On September 2, 2016, the Appellate Court reversed the Board's decision in part, affirmed it in part, and remanded the case to the Board. On October 25, 2016, the Appellate Court Third District issued its mandate. Emerald Performance Materials v. IPCB and IEPA, 2016 IL App (3d) 150526.

In its Order, the Appellate Court concluded that condition 2(h) regarding implementation of agricultural BMPs exceeded the Board's authority and lacked support in the record. Emerald Performance Materials v. IPCB and IEPA, 2016 IL App (3d) 150526 (¶¶26-34). The Court also found that the portion of condition 2(b) concerning ammonia reduction as a metric in employee gain sharing exceeded the Board's authority and lacked support in the record. *Id.* (¶¶35-37). However, the Court affirmed the portion of condition 1 establishing a five-year sunset, stating that it "is appropriate and a valid means to inspire Emerald to attempt to comply with the pollution regulations." *Id.* (¶41).

Consistent with the Appellate Court's order, the Board below strikes the conditions on which it was reversed and replaces its April 16, 2015 order with today's order.

The Board directs its Clerk to file a copy of this opinion and order with the Clerk of the Third District Appellate Court.

**ORDER**

1. Pursuant to Section 28.1 of the Environmental Protection Act (415 ILCS 5/28.1 (2012)), the Board grants Emerald Performance Materials, LLC (Emerald) an adjusted standard from 35 Ill. Adm. Code 304.122(b). Under this adjusted standard, the total ammonia nitrogen effluent standard

at 35 Ill. Adm. Code 304.122(b) does not apply to the discharge of effluent into the Illinois River from the Emerald facility at 1550 County Road 1450 N. in Henry, Marshall County. Instead, Emerald's effluent for total ammonia nitrogen must comply with a daily maximum of 140 milligrams per liter (mg/L) and 1633 pounds per day (lbs/day), as well as a 30-day average of 110 mg/L and 841 lbs/day. This adjusted standard takes effect on April 16, 2015, and expires on April 16, 2020.

2. The adjusted standard granted in paragraph 1 of this order is subject to the following conditions:
  - a. Emerald must continue to maintain the high-rate, multi-port diffuser for the discharge into the Illinois River to achieve an effluent dispersion necessary to meet the applicable ammonia nitrogen water quality standards at the edge of the mixing zone and zone of initial dilution (ZID).
  - b. Emerald must maintain the following ammonia reduction measures: replacement of the BBTS Wet Scrubber with a dust collector; and upgrade of instrumentation for the acetonitrile recovery column.
  - c. Emerald must investigate new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald's discharge. The nitrification inhibitors such as MBT are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.
  - d. Emerald must investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions.
  - e. By April 16, 2018, Emerald must investigate and submit to the Illinois Environmental Protection Agency (Agency) the following studies:
    - i) A study evaluating the use of granulated activated carbon to treat the polymer chemicals tank waste water before it combines with non-polymer chemicals tank waste water to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment. The study must include a technical feasibility evaluation and an economic reasonableness analysis;

- ii) A study evaluating the technical feasibility and the economic reasonableness of a spray irrigation program. The studies must include an evaluation of compliance with the applicable design standards for slow rate land application of treated wastewaters (35 Ill. Adm. Code 372); and
- iii) A study evaluating the addition of water from the Illinois River to the wastewater to determine the potential for subsequent single-stage nitrification in light of the potential dilution. The study must include a technical feasibility evaluation and an economic reasonableness analysis.
- f. Emerald must prepare and submit to the Agency annual reports summarizing its activities to comply with paragraphs 2(c) through 2(e).
- g. If, upon review of the annual reports required by condition 2(f), the Agency determines that new technology to treat ammonia is available that is economically reasonable and technically feasible, the Agency may petition the Board to modify the relief granted by this order.
- h. Emerald must operate in full compliance with the Clean Water Act, its National Pollutant Discharge Elimination System permit, the Board's water pollution regulations, and any other applicable requirement.

IT IS SO ORDERED.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2014); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motion for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on December 1, 2016, by a vote of 5-0.



---

John T. Therriault, Clerk  
Illinois Pollution Control Board

# **EXHIBIT 3**



## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397  
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217782-0610

September 28, 2016

Emerald Polymer Additives, LLC  
1550 County Road 1450 N  
Henry, Illinois 61537

Re: Emerald Polymer Additives, LLC  
NPDES Permit No. IL0001392  
Final Permit

Gentlemen:

Attached is the final NPDES Permit for your discharge. The Permit as issued covers discharge limitations, monitoring, and reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge. The following changes have been made to the permit since the public notice of this permit:

1. The permittee name has been changed to "Emerald Polymer Additives, LLC"
2. On page 5 of the permit, the date of AS 13-2 expiring for ammonia is now listed as April 16, 2020 instead of "until/after expiration of AS 13-2".
3. Special Condition 16 has been rewritten to incorporate only parts 2(a), 2(c), 2(d), 2(e), 2(f), 2(g), and 2(i) of AS 13-2.

The Agency received your comment letter on September 13, 2016. The Agency offers the following response to your comments:

1. Special Condition 16 correctly addresses AS 13-2 and the relief it allows.
2. The Agency has the authority under the Clean Water Act to condition permits. The conditions listed in Special Condition 15 are not necessarily required by AS 13-2, but are conditions pursuant to conditioning the discharge permit under the Act.

Pursuant to the Final NPDES Electronic Reporting Rule, all permittees must report DMRs electronically beginning no later than December 21, 2016. The Agency utilizes NetDMR, a web based application, which allows the submittal of electronic Discharge Monitoring Reports instead of paper Discharge Monitoring Reports (DMRs). More information regarding NetDMR can be found on the Agency website, <http://epa.state.il.us/water/net-dmr/index.html>. If your facility is not registered in the NetDMR program, a supply of preprinted paper DMR Forms will be sent to your facility during the interim period prior to your registration in the NetDMR program. Additional information and instructions will accompany the preprinted DMRs. Please see the attachment regarding the electronic reporting rule.

Page 2

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously-issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at the 217/782-0610.

Sincerely,



Alan Keller, P.E.  
Manager, Permit Section  
Division of Water Pollution Control

SAK: MEL:15042901.docx

Attachment: Reissued Permit

cc: Records  
Compliance Assurance Section  
Peoria Region  
Billing  
USEPA

NPDES Permit No. IL0001392  
Illinois Environmental Protection Agency  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Reissued (NPDES) Permit

Expiration Date: September 30, 2021

Issue Date: September 28, 2016  
Effective Date: October 1, 2016

Name and Address of Permittee:

Emerald Polymer Additives, LLC  
1550 County Road 1450 N  
Henry, Illinois 61537

Facility Name and Address:

Emerald Polymer Additives, LLC  
1550 County Road 1450 N  
Henry, Illinois 61537  
(Marshall County)

Discharge Number and Name:

A01 Process Waste, Cooling Tower Blowdown, Sanitary  
Waste, Process Water Production Waste, Boiler  
Blowdown, Demineralizer Waste and Stormwater  
B01 Stormwater, Non-contact Cooling Water, Lime  
Softening and Demineralizer Waste  
001 Combined Discharges from Outfall A01 and B01  
002 - 006 Stormwater

Receiving Waters:

Illinois River  
Illinois River  
Illinois River  
Illinois River

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.



Alan Keller, P.E.  
Manager, Permit Section  
Division of Water Pollution Control

NPDES Permit No. IL0001392

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Outfall(s): A01\* - Process Discharges – 0.772 MGD DAF  
Cooling Tower Blowdown, Sanitary Waste, Boiler Blowdown, Demineralizer Waste  
and Stormwater - 0.145 MGD DAF  
Total Discharge = 0.917 MGD DAF, 1.40 MGD DMF

PARAMETER	LOAD LIMITS lbs/day		CONCENTRATION		SAMPLE FREQUENCY	SAMPLE TYPE
	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	See Special Condition 1				Daily	Continuous
pH	See Special Condition 2				Daily	Grab
BOD <sub>5</sub>	153	467	20	40	5/Week	Composite
Total Suspended Solids	191	584	25	50	5/Week	Composite
Fecal Coliform	See Special Condition 10				1/Month	Grab
Temperature	See Special Condition 3				Daily	Continuous
Chromium (Total)	6.5	13	1	2	1/Year	Composite
Copper		2.56		0.215	1/Year	Composite
Cyanide	0.76	2.34	0.1	0.2	1/Year	Grab
Lead	2.0	4.3	0.2	0.4	1/Year	Composite
Nickel	7.6	23.4	1	2	1/Year	Composite
Zinc	6.5	13	1	2	1/Year	Composite
Acenaphthene	0.142	0.380	0.022	0.059	1/Year	Grab
Acrylonitrile	0.618	1.558	0.096	0.242	1/Year	Grab
Benzene	0.238	0.876	0.037	0.136	1/Year	Grab
Carbon Tetrachloride	0.116	0.245	0.018	0.038	1/Year	Grab
Chlorobenzene	0.097	0.180	0.015	0.028	1/Year	Grab
1,2,4-Trichlorobenzene	0.438	0.901	0.068	0.140	1/Year	Grab
Hexachlorobenzene	0.097	0.180	0.015	0.028	1/Year	Grab
1,2-Dichloroethane	0.438	1.359	0.068	0.211	1/Year	Grab
1,1,1-Trichloroethane	0.135	0.348	0.021	0.054	1/Year	Grab
Hexachloroethane	0.135	0.348	0.021	0.054	1/Year	Grab
1,1-Dichloroethane	0.142	0.380	0.022	0.059	1/Year	Grab
1,1,2-Trichloroethane	0.135	0.348	0.021	0.054	1/Year	Grab
Chloroethane	0.670	1.726	0.104	0.268	1/Year	Grab

NPDES Permit No. IL0001392

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Continue Outfall(s): A01\* Total Discharge = 0.917 MGD DAF, 1.40 MGD DMF

PARAMETER	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l		SAMPLE FREQUENCY	SAMPLE TYPE
	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM		
Chloroform	0.135	0.296	0.021	0.046	1/Quarter	Grab
2-Chlorophenol	0.200	0.631	0.031	0.098	1/Year	Grab
1,2-Dichlorobenzene	0.496	1.049	0.077	0.163	1/Year	Grab
1,3-Dichlorobenzene	0.200	0.283	0.031	0.044	1/Year	Grab
1,4-Dichlorobenzene	0.097	0.180	0.015	0.028	1/Year	Grab
1,1-Dichloroethylene	0.103	0.161	0.016	0.025	1/Year	Grab
1,2-Trans Dichloroethylene	0.135	0.348	0.021	0.054	1/Year	Grab
2,4-Dichlorophenol	0.251	0.721	0.039	0.112	1/Year	Grab
1,2-Dichloropropane	0.985	1.481	0.153	0.230	1/Year	Grab
1,3-Dichloropropylene	0.187	0.283	0.029	0.044	1/Year	Grab
2,4-Dimethylphenol	0.116	0.232	0.018	0.036	1/Year	Grab
2,4-Dinitrotoluene	0.728	1.835	0.113	0.285	1/Year	Grab
2,6-Dinitrotoluene	1.642	4.127	0.255	0.641	1/Year	Grab
Ethylbenzene	0.206	0.695	0.032	0.108	1/Year	Grab
Fluoranthene	0.161	0.438	0.025	0.068	1/Year	Grab
Methylene Chloride	0.258	0.573	0.040	0.089	1/Month	Grab
Methyl Chloride	0.554	1.223	0.086	0.190	1/Year	Grab
Hexachlorobutadiene	0.129	0.315	0.020	0.049	1/Year	Grab
Naphthalene	0.142	0.380	0.022	0.059	1/Year	Grab
Nitrobenzene	0.174	0.438	0.027	0.068	1/Year	Grab
2-Nitrophenol	0.264	0.444	0.041	0.069	1/Year	Grab
4-Nitrophenol	0.464	0.798	0.072	0.124	1/Year	Grab
2,4-Dinitrophenol	0.457	0.792	0.071	0.123	1/Year	Grab
4,6-Dinitro-o-Cresol	0.502	1.783	0.078	0.277	1/Year	Grab

NPDES Permit No. IL0001392

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Continue Outfall(s): A01\* Total Discharge = 0.917 MGD DAF, 1.40 MGD DMF

PARAMETER	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l		SAMPLE FREQUENCY	SAMPLE TYPE
	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM		
Phenol	0.097	0.167	0.015	0.026	1/Year	Grab
Bis(2-ethylhexyl)phthalate	0.663	1.796	0.103	0.279	1/Year	Grab
Di-n-butyl phthalate	0.174	0.367	0.027	0.057	1/Year	Grab
Diethyl phthalate	0.522	1.307	0.081	0.203	1/Year	Grab
Dimethyl phthalate	0.122	0.303	0.019	0.047	1/Year	Grab
Benzo(a)anthracene	0.142	0.380	0.022	0.059	1/Year	Grab
Benzo(a)pyrene	0.148	0.393	0.023	0.061	1/Year	Grab
3,4-Benzofluoranthene	0.148	0.393	0.023	0.061	1/Year	Grab
Benzo(k)fluoranthene	0.142	0.380	0.022	0.059	1/Year	Grab
Chrysene	0.142	0.380	0.022	0.059	1/Year	Grab
Acenaphthylene	0.142	0.380	0.022	0.059	1/Year	Grab
Anthracene	0.142	0.380	0.022	0.059	1/Year	Grab
Fluorene	0.142	0.380	0.022	0.059	1/Year	Grab
Phenanthrene	0.142	0.380	0.022	0.059	1/Year	Grab
Pyrene	0.161	0.431	0.025	0.067	1/Year	Grab
Tetrachloroethylene	0.142	0.361	0.022	0.056	1/Year	Grab
Toluene	0.167	0.515	0.026	0.080	1/Year	Grab
Trichloroethylene	0.135	0.348	0.021	0.054	1/Year	Grab
Vinyl Chloride	0.670	1.726	0.104	0.268	1/Year	Grab

\*See Special Conditions 4, 9 and 14.

NPDES Permit No. IL0001392

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l		SAMPLE FREQUENCY	SAMPLE TYPE
	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM		
Outfall: B01* Stormwater, Non-contact Cooling Water, Lime Softening and Demineralizer Waste DAF = 0.03 MGD						
Flow (MGD)	See Special Condition 1				Continuous	Estimate
pH	See Special Condition 2			Monitor Only	1/Month	Grab
BOD <sub>5</sub>				Monitor Only	1/Month	Grab
Total Suspended Solids				Monitor Only	1/Month	Grab
Total Iron				Monitor Only	1/Month	Grab
COD				Monitor Only	1/Month	Grab

\*See Special Condition 5.

Outfall: 001\* - Combined Outfall of A01 and B01 - Total Discharge = 0.917 MGD DAF, 1.40 MGD DMF

Flow (MGD)	See Special Condition 1				Daily	Calculate
Ammonia (as N)** until April 16, 2020	841	1633	110	140	Daily	Composite
Ammonia (as N)** after April 16, 2020	23	70	3	6	Daily	Composite
Total Nitrogen				Monitor Only	1/Week	Composite

\*See Special Condition 6.

\*\*See Special Condition 16.

Outfalls: 002 through 006\* - Stormwater Runoff - Intermittent Discharge

\*See Special Condition 18 for Stormwater Pollution Prevention Plan (SWPPP).

Special Conditions

SPECIAL CONDITION 1. Flow shall be reported in units of Million Gallons per Day (MGD) as a monthly average and daily maximum value.

SPECIAL CONDITION 2. The pH shall be in the range 6.0 to 9.0. The monthly minimum and monthly maximum values shall be reported on the DMR form.

SPECIAL CONDITION 3. This facility meets the allowed mixing criteria for thermal discharges pursuant to 35 IAC 302.102. No reasonable potential exists for the discharge to exceed thermal water quality standards. This determination is based on a design average flow of 0.782 MGD and a maximum effluent temperature 94° F. The permittee shall monitor the flow and temperature of the discharge prior to entry into the receiving water body. Monitoring results shall be reported on the monthly Discharge Monitoring Report. This permit may be modified to include formal temperature limitations should the results of the monitoring show that there is a reasonable potential to exceed a thermal water quality standard. Modification of this permit shall follow public notice and opportunity for comment.

SPECIAL CONDITION 4. For the purpose of this permit, the discharge from outfall A01 is limited to process waste water, cooling tower blowdown, sanitary waste, process water production waste and stormwater from both facilities and the Mexichem Specialty Resins' demineralizer waste and boiler blowdown and will serve as an alternate route for waters discharged normally from outfall B01, the discharge shall be free from other wastewater discharges. Sampling for the monitoring requirements for the discharge shall be taken prior to mixing with the discharge from outfall B01.

SPECIAL CONDITION 5. For the purpose of this permit, the discharge from outfall B01 is limited to stormwater, non-contact cooling water, lime softening and demineralizer waste, free from other waste water discharges. Sampling for the monitoring requirements for the discharge shall be taken prior to mixing with the discharge from outfall A01.

SPECIAL CONDITION 6. 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.

SPECIAL CONDITION 7. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

SPECIAL CONDITION 8. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee will be required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA beginning December 21, 2016. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, <http://www.epa.state.il.us/water/net-dmr/index.html>.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 25th day of the following month, unless otherwise specified by the permitting authority.

Permittees not using NetDMRs during the interim period before December 21, 2016 shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency  
Division of Water Pollution Control  
Attention: Compliance Assurance Section, Mail Code # 19  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

SPECIAL CONDITION 9. Quarterly sampling for outfall A01 shall be performed in March, June, September and December with analytical results submitted in April, July, October and January. Yearly sampling for outfall A01 shall be performed in March with sample results submitted in April.

SPECIAL CONDITION 10. The daily maximum fecal coliform count shall not exceed 400 per 100 ml.

SPECIAL CONDITION 11. The provisions contained in 40 CFR 122.41 (m) and (n) are applicable to this permit.

Special Conditions

SPECIAL CONDITION 12. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 13. If an applicable water quality standard or limitation is developed under 35 Ill. Adm. Code 302.210 and that water quality standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the NPDES Permit and found in the effluent at a level of concern, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition after Public Notice and opportunity for hearing.

SPECIAL CONDITION 14. The Permittee shall conduct annual biomonitoring using Outfall 001 effluent.

Biomonitoring

1. Acute Toxicity - Standard definitive acute toxicity tests shall be run on at least two trophic levels of aquatic species (fish, invertebrate) representative of the aquatic community of the receiving stream. Testing must be consistent with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (Fifth Ed.) EPA/821-R-02-012. Unless substitute tests are pre-approved; the following tests are required:
  - a. Fish - 96 hour static LC<sub>50</sub> Bioassay using fathead minnows (*Pimephales promelas*).
  - b. Invertebrate 48-hour static LC<sub>50</sub> Bioassay using *Ceriodaphnia*.
2. Test Requirements - The above test shall be conducted annually using 24-hour composite samples unless otherwise authorized by the IEPA. Effluent samples must be analyzed for ammonia given that this parameter may be associated with acute toxicity. The dilution series to be utilized shall consist of the following: 12.5%, 6.25%, 3.125%, 1.565%, and 0.78% effluent.
3. Reporting - Results shall be reported according to EPA/821-R-02-012, Section 12, Report Preparation, and shall be submitted to IEPA, Bureau of Water, Compliance Assurance Section within one week of receipt from the laboratory. Results from ammonia analysis, as well as any other parameter believed to contribute to effluent toxicity, must be included in the bioassay report.
4. Toxicity - Should a bioassay indicate an acute LC50 of less than 2.1% effluent and the effluent is found to contain non-toxic amounts of ammonia in accordance with Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity, EPA/600/R-92/080 Tables 3.2 and 3.3, the IEPA may require, upon notification, six (6) additional rounds of monthly testing on the affected organism(s) to be initiated within 30 days of the toxic bioassay. Results shall be submitted to IEPA within one (1) week of becoming available to the Permittee.
5. Toxicity Identification and Reduction Evaluation - Should any of the additional bioassays indicate an acute LC50 of less than 2.1% effluent and the effluent is found to contain non-toxic amounts of ammonia in accordance with the tables listed above, the Permittee must provide notice to the IEPA within seven (7) days of the results becoming available to the Permittee and begin the toxicity identification evaluation process in accordance with Methods for Aquatic Toxicity Identification Evaluations, EPA/600/6-91/003. The IEPA may also require, upon notification, that the Permittee prepare a plan for toxicity reduction evaluation to be developed in accordance with Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833B-99/002, which shall include an evaluation to determine which chemicals have a potential for being discharged in the plant wastewater, a monitoring program to determine their presence or absence and to identify other compounds which are not being removed by treatment, and other measures as appropriate. The Permittee shall submit to the IEPA its plan for toxicity reduction evaluation within ninety (90) days following notification by the IEPA. The Permittee shall implement the plan within ninety (90) days or other such date as contained in a notification letter received from the IEPA.

The IEPA may modify this Permit during its term to incorporate additional requirements or limitations based on the results of the biomonitoring. In addition, after review of the monitoring results, the IEPA may modify this Permit to include numerical limitations for specific toxic pollutants. Modifications under this condition shall follow public notice and opportunity for hearing.

SPECIAL CONDITION 15.

Investigation of New Treatment Technologies to Prevent Nitrification Inhibition and Allow Ammonia Reduction

The permittee shall investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions. The investigation shall include, but not be limited to preventing nitrification inhibition from mercaptobenzothiazole (MBT). The investigation should include but not be limited to the following:

- A. The permittee shall sample for MBT as follows:
  1. The permittee shall sample for MBT on a weekly basis at the secondary clarifier.

Special Conditions

2. The permittee shall sample for MBT at a point between the PC Tank and the Primary Clarifier at a minimum of once per month.
3. The Agency may request modification to this section if there is a change in operations or treatment.

B. The investigation and evaluation of new and existing treatment technology should include, but not be limited to the following:

1. The permittee shall evaluate the effectiveness of the treatment equipment that is already installed and investigate the optimization of these units. The permittee shall also investigate the mode of operation of the aeration basins and consider the optimization of these basins with respect to nitrification.

The effectiveness of the treatment equipment and its optimization are defined as to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment, taking into account technical feasibility and economic reasonableness.

2. The permittee shall evaluate new and modified treatment methods, including but not limited to granulated activated carbon addition and dilution, at points which are optimized for the best degree of treatment.

The effectiveness of the treatment equipment and its optimization are defined as to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment, taking into account technical feasibility and economic reasonableness.

C. The permittee shall prepare and submit to the Agency annual reports summarizing its activities to comply with this Special Condition as well as paragraphs 2(c) through 2(e) pursuant to AS 13-2.

SPECIAL CONDITION 16. The Illinois Pollution Control Board granted Permittee an Adjusted Standard (AS 13-2) for ammonia on April 16, 2015. Under this adjusted standard, the total ammonia nitrogen effluent standard of 35 Ill. Adm. Code 304.122(b) does not apply to the discharge of effluent into the Illinois River from the Permittee's facility at 1550 Country Road 1450 N. in Henry, Marshall County. Permittee's effluent for total ammonia nitrogen must comply with a daily maximum of 140 milligrams per liter (mg/L) and 1,633 pounds per day (lbs/day), and a 30-day average of 110 mg/L and 841 lbs/day. This adjusted standard expires on April 16, 2020. The following conditions of the Adjusted Standard, AS 13-2, are incorporated in this permit by reference: 2(a), 2(c), 2(d), 2(e), 2(f), 2(g), and 2(i). Permittee must maintain the following ammonia reduction measures: replacement of the BBTS Wet Scrubber with a dust collector and upgrade of instrumentation for the acetonitrile recovery column. When this adjusted standard for ammonia expires, the permittee shall be subject to ammonia standards pursuant to 35 Ill. Adm. Code 304.122(b).

SPECIAL CONDITION 17. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

SPECIAL CONDITION 18.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A. A storm water pollution prevention plan shall be maintained by the permittee for the storm water associated with industrial activity at this facility. The plan shall identify potential sources of pollution which may be expected to affect the quality of storm water discharges associated with the industrial activity at the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. The permittee shall modify the plan if substantive changes are made or occur affecting compliance with this condition.

1. Waters not classified as impaired pursuant to Section 303(d) of the Clean Water Act.

Unless otherwise specified by federal regulation, the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event.

2. Waters classified as impaired pursuant to Section 303(d) of the Clean Water Act

For any site which discharges directly to an impaired water identified in the Agency's 303(d) listing, and if any parameter in the subject discharge has been identified as the cause of impairment, the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event. If required by federal regulations, the storm water pollution prevention plan shall adhere to a more restrictive design criteria.

B. The operator or owner of the facility shall make a copy of the plan available to the Agency at any reasonable time upon request.

Facilities which discharge to a municipal separate storm sewer system shall also make a copy available to the operator of the

Special Conditions

municipal system at any reasonable time upon request.

- C. The permittee may be notified by the Agency at any time that the plan does not meet the requirements of this condition. After such notification, the permittee shall make changes to the plan and shall submit a written certification that the requested changes have been made. Unless otherwise provided, the permittee shall have 30 days after such notification to make the changes.
- D. The discharger shall amend the plan whenever there is a change in construction, operation, or maintenance which may affect the discharge of significant quantities of pollutants to the waters of the State or if a facility inspection required by paragraph H of this condition indicates that an amendment is needed. The plan should also be amended if the discharger is in violation of any conditions of this permit, or has not achieved the general objective of controlling pollutants in storm water discharges. Amendments to the plan shall be made within 30 days of any proposed construction or operational changes at the facility, and shall be provided to the Agency for review upon request.
- E. The plan shall provide a description of potential sources which may be expected to add significant quantities of pollutants to storm water discharges, or which may result in non-storm water discharges from storm water outfalls at the facility. The plan shall include, at a minimum, the following items:
  - 1. A topographic map extending one-quarter mile beyond the property boundaries of the facility, showing: the facility, surface water bodies, wells (including injection wells), seepage pits, infiltration ponds, and the discharge points where the facility's storm water discharges to a municipal storm drain system or other water body. The requirements of this paragraph may be included on the site map if appropriate. Any map or portion of map may be withheld for security reasons.
  - 2. A site map showing:
    - i. The storm water conveyance and discharge structures;
    - ii. An outline of the storm water drainage areas for each storm water discharge point;
    - iii. Paved areas and buildings;
    - iv. Areas used for outdoor manufacturing, storage, or disposal of significant materials, including activities that generate significant quantities of dust or particulates.
    - v. Location of existing storm water structural control measures (dikes, coverings, detention facilities, etc.);
    - vi. Surface water locations and/or municipal storm drain locations
    - vii. Areas of existing and potential soil erosion;
    - viii. Vehicle service areas;
    - ix. Material loading, unloading, and access areas.
    - x. Areas under items iv and ix above may be withheld from the site for security reasons.
  - 3. A narrative description of the following:
    - i. The nature of the industrial activities conducted at the site, including a description of significant materials that are treated, stored or disposed of in a manner to allow exposure to storm water;
    - ii. Materials, equipment, and vehicle management practices employed to minimize contact of significant materials with storm water discharges;
    - iii. Existing structural and non-structural control measures to reduce pollutants in storm water discharges;
    - iv. Industrial storm water discharge treatment facilities;
    - v. Methods of onsite storage and disposal of significant materials.
  - 4. A list of the types of pollutants that have a reasonable potential to be present in storm water discharges in significant quantities. Also provide a list of any pollutant that is listed as impaired in the most recent 303(d) report.
  - 5. An estimate of the size of the facility in acres or square feet, and the percent of the facility that has impervious areas such as pavement or buildings.
  - 6. A summary of existing sampling data describing pollutants in storm water discharges.

Special Conditions

- F. The plan shall describe the storm water management controls which will be implemented by the facility. The appropriate controls shall reflect identified existing and potential sources of pollutants at the facility. The description of the storm water management controls shall include:
1. Storm Water Pollution Prevention Personnel - Identification by job titles of the individuals who are responsible for developing, implementing, and revising the plan.
  2. Preventive Maintenance - Procedures for inspection and maintenance of storm water conveyance system devices such as oil/water separators, catch basins, etc., and inspection and testing of plant equipment and systems that could fail and result in discharges of pollutants to storm water.
  3. Good Housekeeping - Good housekeeping requires the maintenance of clean, orderly facility areas that discharge storm water. Material handling areas shall be inspected and cleaned to reduce the potential for pollutants to enter the storm water conveyance system.
  4. Spill Prevention and Response - Identification of areas where significant materials can spill into or otherwise enter the storm water conveyance systems and their accompanying drainage points. Specific material handling procedures, storage requirements, spill clean up equipment and procedures should be identified, as appropriate. Internal notification procedures for spills of significant materials should be established.
  5. Storm Water Management Practices - Storm water management practices are practices other than those which control the source of pollutants. They include measures such as installing oil and grit separators, diverting storm water into retention basins, etc. Based on assessment of the potential of various sources to contribute pollutants, measures to remove pollutants from storm water discharge shall be implemented. In developing the plan, the following management practices shall be considered:
    - i. Containment - Storage within berms or other secondary containment devices to prevent leaks and spills from entering storm water runoff. To the maximum extent practicable storm water discharged from any area where material handling equipment or activities, raw material, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water should not enter vegetated areas or surface waters or infiltrate into the soil unless adequate treatment is provided.
    - ii. Oil & Grease Separation - Oil/water separators, booms, skimmers or other methods to minimize oil contaminated storm water discharges.
    - iii. Debris & Sediment Control - Screens, booms, sediment ponds or other methods to reduce debris and sediment in storm water discharges.
    - iv. Waste Chemical Disposal - Waste chemicals such as antifreeze, degreasers and used oils shall be recycled or disposed of in an approved manner and in a way which prevents them from entering storm water discharges.
    - v. Storm Water Diversion - Storm water diversion away from materials manufacturing, storage and other areas of potential storm water contamination. Minimize the quantity of storm water entering areas where material handling equipment or activities, raw material, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water using green infrastructure techniques where practicable in the areas outside the exposure area, and otherwise divert storm water away from exposure area.
    - vi. Covered Storage or Manufacturing Areas - Covered fueling operations, materials manufacturing and storage areas to prevent contact with storm water.
    - vii. Storm Water Reduction - Install vegetation on roofs of buildings within adjacent to the exposure area to detain and evapotranspire runoff where precipitation falling on the roof is not exposed to contaminants, to minimize storm water runoff; capture storm water in devices that minimize the amount of storm water runoff and use this water as appropriate based on quality.
  6. Sediment and Erosion Prevention - The plan shall identify areas which due to topography, activities, or other factors, have a high potential for significant soil erosion. The plan shall describe measures to limit erosion.
  7. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution control plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.
  8. Inspection Procedures - Qualified plant personnel shall be identified to inspect designated equipment and plant areas. A tracking or follow-up procedure shall be used to ensure appropriate response has been taken in response to an inspection. Inspections and maintenance activities shall be documented and recorded.

Special Conditions

- G. Non-Storm Water Discharge - The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharge. The certification shall include a description of any test for the presence of non-storm water discharges, the methods used, the dates of the testing, and any onsite drainage points that were observed during the testing. Any facility that is unable to provide this certification must describe the procedure of any test conducted for the presence of non-storm water discharges, the test results, potential sources of non-storm water discharges to the storm sewer, and why adequate tests for such storm sewers were not feasible.
- H. Quarterly Visual Observation of Discharges - The requirements and procedures of quarterly visual observations are applicable to all outfalls covered by this condition.
1. You must perform and document a quarterly visual observation of a storm water discharge associated with industrial activity from each outfall. The visual observation must be made during daylight hours. If no storm event resulted in runoff during daylight hours from the facility during a monitoring quarter, you are excused from the visual observations requirement for that quarter, provided you document in your records that no runoff occurred. You must sign and certify the document.
  2. Your visual observation must be made on samples collected as soon as practical, but not to exceed 1 hour or when the runoff or snow melt begins discharging from your facility. All samples must be collected from a storm event discharge that is greater than 0.1 inch in magnitude and that occurs at least 72 hours from the previously measureable (greater than 0.1 inch rainfall) storm event. The observation must document: color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. If visual observations indicate any unnatural color, odor, turbidity, floatable material, oil sheen or other indicators of storm water pollution, the permittee shall obtain a sample and monitor for the parameter or the list of pollutants in Part E.4.
  3. You must maintain your visual observation reports onsite with the SWPPP. The report must include the observation date and time, inspection personnel, nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.
  4. You may exercise a waiver of the visual observation requirement at a facility that is inactive or unstaffed, as long as there are no industrial materials or activities exposed to storm water. If you exercise this waiver, you must maintain a certification with your SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to storm water.
  5. Representative Outfalls - If your facility has two or more outfalls that you believe discharge substantially identical effluents, based on similarities of the industrial activities, significant materials, size of drainage areas, and storm water management practices occurring within the drainage areas of the outfalls, you may conduct visual observations of the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s).
  6. The visual observation documentation shall be made available to the Agency and general public upon written request.
- I. The permittee shall conduct an annual facility inspection to verify that all elements of the plan, including the site map, potential pollutant sources, and structural and non-structural controls to reduce pollutants in industrial storm water discharges are accurate. Observations that require a response and the appropriate response to the observation shall be retained as part of the plan. Records documenting significant observations made during the site inspection shall be submitted to the Agency in accordance with the reporting requirements of this permit.
- J. This plan should briefly describe the appropriate elements of other program requirements, including Spill Prevention Control and Countermeasures (SPCC) plans required under Section 311 of the CWA and the regulations promulgated thereunder, and Best Management Programs under 40 CFR 125.100.
- K. The plan is considered a report that shall be available to the public at any reasonable time upon request.
- L. The plan shall include the signature and title of the person responsible for preparation of the plan and include the date of initial preparation and each amendment thereto.
- M. Facilities which discharge storm water associated with industrial activity to municipal separate storm sewers may also be subject to additional requirement imposed by the operator of the municipal system

Construction Authorization

Authorization is hereby granted to construct treatment works and related equipment that may be required by the Storm Water Pollution Prevention Plan developed pursuant to this permit.

This Authorization is issued subject to the following condition(s).

- N. If any statement or representation is found to be incorrect, this authorization may be revoked and the permittee there upon waives

Special Conditions

all rights thereunder.

- O. The issuance of this authorization (a) does not release the permittee from any liability for damage to persons or property caused by or resulting from the installation, maintenance or operation of the proposed facilities; (b) does not take into consideration the structural stability of any units or part of this project; and (c) does not release the permittee from compliance with other applicable statutes of the State of Illinois, or other applicable local law, regulations or ordinances.
- P. Plans and specifications of all treatment equipment being included as part of the stormwater management practice shall be included in the SWPPP.
- Q. Construction activities which result from treatment equipment installation, including clearing, grading and excavation activities which result in the disturbance of one acre or more of land area, are not covered by this authorization. The permittee shall contact the IEPA regarding the required permit(s).

REPORTING

- R. The facility shall submit an electronic copy of the annual inspection report to the Illinois Environmental Protection Agency. The report shall include results of the annual facility inspection which is required by Part I of this condition. The report shall also include documentation of any event (spill, treatment unit malfunction, etc.) which would require an inspection, results of the inspection, and any subsequent corrective maintenance activity. The report shall be completed and signed by the authorized facility employee(s) who conducted the inspection(s). The annual inspection report is considered a public document that shall be available at any reasonable time upon request.
- S. The annual report shall be due August 1.
- T. If the facility performs inspections more frequently than required by this permit, the results shall be included as additional information in the annual report.
- U. The permittee shall retain the annual inspection report on file at least 3 years. This period may be extended by request of the Illinois Environmental Protection Agency at any time.

Annual inspection reports shall be mailed to the following address:

Illinois Environmental Protection Agency  
Bureau of Water  
Compliance Assurance Section  
Annual Inspection Report  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

- V. The permittee shall notify any regulated small municipal separate storm sewer owner (MS4 Community) that they maintain coverage under an individual NPDES permit. The permittee shall submit any SWPPP or any annual inspection to the MS4 community upon request by the MS4 community.

**Attachment H**

**Standard Conditions**

**Definitions**

**Act** means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

**Agency** means the Illinois Environmental Protection Agency.

**Board** means the Illinois Pollution Control Board.

**Clean Water Act** (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

**NPDES** (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

**USEPA** means the United States Environmental Protection Agency.

**Daily Discharge** means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

**Maximum Daily Discharge Limitation** (daily maximum) means the highest allowable daily discharge.

**Average Monthly Discharge Limitation** (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

**Average Weekly Discharge Limitation** (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

**Best Management Practices** (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

**Aliquot** means a sample of specified volume used to make up a total composite sample.

**Grab Sample** means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

**24-Hour Composite Sample** means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

**8-Hour Composite Sample** means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

**Flow Proportional Composite Sample** means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

- (1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.
- (2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.
- (3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- (4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- (5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.
- (6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- (7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.
- (8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

- (9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:
- Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
  - Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.
- (10) **Monitoring and records.**
- Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  - The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.
  - Records of monitoring information shall include:
    - The date, exact place, and time of sampling or measurements;
    - The individual(s) who performed the sampling or measurements;
    - The date(s) analyses were performed;
    - The individual(s) who performed the analyses;
    - The analytical techniques or methods used; and
    - The results of such analyses.
  - Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.
- (11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.
- Application.** All permit applications shall be signed as follows:
    - For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation;
    - For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
    - For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
  - Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a

person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- The authorization is made in writing by a person described in paragraph (a); and
  - The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and
  - The written authorization is submitted to the Agency.
- (c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.
- (d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**

- Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when:
  - The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or
  - The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).
  - The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- Transfers.** This permit is not transferable to any person except after notice to the Agency.
- Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

- (e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.
- (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).
  - (2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
  - (3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.
- (f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:
- (1) Any unanticipated bypass which exceeds any effluent limitation in the permit.
  - (2) Any upset which exceeds any effluent limitation in the permit.
  - (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.  
The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.
- (g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).
- (h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.
- (13) **Bypass.**
- (a) **Definitions.**
    - (1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
    - (2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
  - (b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).
- (c) **Notice.**
- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
  - (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).
- (d) **Prohibition of bypass.**
- (1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:
    - (i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
    - (ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
    - (iii) The permittee submitted notices as required under paragraph (13)(c).
  - (2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).
- (14) **Upset.**
- (a) **Definition.** Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
  - (b) **Effect of an upset.** An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
  - (c) **Conditions necessary for a demonstration of upset.** A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
    - (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
    - (2) The permitted facility was at the time being properly operated; and
    - (3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).
    - (4) The permittee complied with any remedial measures required under paragraph (4).
  - (d) **Burden of proof.** In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

- (15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:
- (a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.
- (b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:
- (1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
  - (2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
  - (3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.
- (16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
- (1) One hundred micrograms per liter (100 ug/l);
  - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
  - (3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
  - (4) The level established by the Agency in this permit.
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.
- (17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
- (a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
  - (b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
  - (c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.
- (18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
- (a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
  - (b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
  - (c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.
- (19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.
- (20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.
- (21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.
- (22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed \$25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one year, or both. Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).
- (23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.
- (24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- (25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.
- (26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.
- (27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.
- (28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.



United States  
Environmental Protection Agency

Office of Enforcement and  
Compliance Assurance

September 2015

---

## Final NPDES Electronic Reporting Rule

---

On 24 September 2015, Administrator Gina McCarthy signed the final National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule for publication in the Federal Register. The publication of this rule is the latest step in an extensive multi-year outreach effort with EPA's state, tribal and territorial partners. This rule will replace most paper-based Clean Water Act (CWA) NPDES permitting and compliance monitoring reporting requirements with electronic reporting.

### Purpose of the Final Rule

This final rule is designed to save authorized state, tribe, or territorial NPDES programs considerable resources, make reporting easier for NPDES-regulated entities, streamline permit renewals, ensure full exchange of basic NPDES permit data between states and EPA, improve environmental decision-making, and better protect human health and the environment.

This final rule requires that NPDES regulated entities electronically submit the following permit and compliance monitoring information instead of using paper reports:

- Discharge Monitoring Reports (DMRs);
- Notices of Intent to discharge in compliance with a general permit; and
- Program reports.

Authorized NPDES programs will also electronically submit NPDES program data to EPA to ensure that there is consistent and complete reporting nationwide, and to expedite the collection and processing of the data, thereby making it more accurate and timely. Importantly, while the rule changes the method by which information is provided (i.e., electronic rather than paper-based), it does not increase the amount of information required from NPDES regulated entities facilities under existing regulations.

### Overview of Benefits

EPA anticipates that the final rule will save significant resources for states, tribes, and territories as well as EPA and NPDES permittees, while resulting in a more complete, accurate, and nationally-consistent set of data about the NPDES program. With full implementation (5 years after the effective date), the anticipated savings are:

- Authorized State NPDES programs: \$22.6 million annually,
- NPDES regulated entities: \$0.5 million annually, and
- EPA: \$1.2 million annually.

the authorized NPDES biosolids program); and all other remaining NPDES program reports. These program reports include:

- Sewage Sludge/Biosolids Annual Program Reports [40 CFR 503] (for the 8 states that implement the Federal Biosolids Program)
- Concentrated Animal Feeding Operation (CAFO) Annual Program Reports [40 CFR 122.42(e)(4)]
- Municipal Separate Storm Sewer System (MS4) Program Reports [40 CFR 122.34(g)(3) and 122.42(c)]
- Pretreatment Program Reports [40 CFR 403.12(i)]
- Significant Industrial User Compliance Reports in Municipalities Without Approved Pretreatment Programs [40 CFR 403.12(e) and (h)]
- Sewer Overflow/Bypass Event Reports [40 CFR 122.41(l)(4), (l)(6) and (7), (m)(3)]
- CWA Section 316(b) Annual Reports [40 CFR 125 Subpart J]

#### **How the final rule addresses comments**

In response to concerns about implementation raised during the comment periods, the final rule provides authorized NPDES programs more flexibility to implement the final rule by providing them up to three additional years to electronically collect, manage, and share their data. Authorized NPDES Programs will also have more flexibility in how they can grant electronic reporting waivers.

#### **Further Information**

For additional information, please contact Messrs. John Dombrowski, Director, Enforcement Targeting and Data Division (202-566-0742) or Carey A. Johnston (202-566-1014), Office of Compliance (mail code 2222A), Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460; e-mail addresses: dombrowski.john@epa.gov or johnston.carey@epa.gov.

#### **Useful Final Rule Link:**

Email sign up for outreach events

<https://public.govdelivery.com/accounts/USAEPAOECA/subscriber/new?>

# **EXHIBIT 4**

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2013

End Date: 12/31/2013

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (#/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (ppm/MM)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Plant Effluent Flow (gpm)	Ammonia Load (#/day)	Total Nitrogen (lb/day)	tBOD Load (lb/day)	TSS Load (lb/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2013						70.00				4.00	4.00	611.21	513.42		29.34	29.34	7.20	73.00				
1/2/2013						80.00				4.00	4.00	598.67	574.72		28.74	28.74	7.32	73.00				
1/3/2013						80.00				4.70	4.00	644.83	619.04		36.37	30.95	7.52	75.00				
1/4/2013												606.79					7.46	70.00				
1/5/2013												589.64					7.40	71.00				
1/6/2013	1.00				160.00	96.00				4.00	4.00	606.60	698.80		29.12	29.12	7.37	71.00				
1/7/2013						92.00				4.00	4.80	622.41	687.14		29.88	35.85	7.48	72.00				
1/8/2013						88.00				4.00	4.00	587.00	619.87		28.18	28.18	7.39	74.00				
1/9/2013						84.00				4.00	4.00	591.23	595.96		28.38	28.38	7.34	75.00				
1/10/2013						77.00				4.00	4.00	641.59	592.83		30.80	30.80	7.26	72.00				
1/11/2013												626.74					7.20	75.00				
1/12/2013												712.05					7.13	73.00				
1/13/2013						73.00				4.00	4.00	712.39	624.05		34.19	34.19	7.23	71.00				
1/14/2013						74.00				4.00	6.40	714.60	634.56		34.30	54.88	6.90	71.00				
1/15/2013						88.00				4.00	4.00	738.31	779.66		35.44	35.44	7.12	68.00				
1/16/2013						99.00				4.00	8.00	734.67	872.79		35.26	70.53	7.21	70.00				
1/17/2013						90.00				4.00	5.60	714.71	771.89		34.31	48.03	7.14	70.00				
1/18/2013												685.73					7.09	75.00				
1/19/2013												665.42					6.91	77.00				
1/20/2013						100.00				4.20	21.00	647.23	776.68		32.62	163.10	7.04	77.00				
1/21/2013						110.00				4.00	8.80	667.30	880.84		32.03	70.47						
1/22/2013						100.00				4.00	9.20	444.27	533.12		21.32	49.05	7.06	64.00				
1/23/2013						160.00				4.00	12.00	547.03	1,050.30		26.26	76.77	7.08	71.00				
1/24/2013						92.00				4.60	24.00	523.45	577.89		28.89	150.75	7.05	71.00				
1/25/2013												575.95					7.03	74.00				
1/26/2013												642.08					7.01	72.00				

1/27/2013		76.00		4.10	9.60	735.27	670.57	36.18	84.70	6.93	72.00
1/28/2013		67.00		4.00	4.80	727.18	584.65	34.90	41.89	7.06	77.00
1/29/2013		65.00		4.00	4.00	703.82	548.98	33.78	33.78	7.11	79.00
1/30/2013		70.00		4.00	5.60	708.61	595.23	34.01	47.62	7.18	79.00
1/31/2013		69.00		4.00	8.40	658.19	544.98	31.59	86.35	7.18	72.00
2/1/2013						387.21				7.64	61.00
2/2/2013						597.19				7.18	68.00
2/3/2013		70.00		5.00	6.40	666.11	559.53	39.97	51.16	7.35	71.00
2/4/2013	1.00	910.00	76.00	7.60	15.00	650.96	593.68	59.37	117.17	7.36	74.00
2/5/2013		85.00		9.00	6.80	658.04	671.20	71.07	53.70	7.35	75.00
2/6/2013		84.00		13.00	7.60	633.59	638.66	98.84	57.78	7.35	76.00
2/7/2013		96.00		19.00	12.00	653.85	753.24	149.08	94.15	7.40	76.00
2/8/2013						673.29				7.42	72.00
2/9/2013						594.46				7.04	73.00
2/10/2013		5,800.00	90.00	12.00	12.00	555.64	600.09	80.01	80.01	7.11	72.00
2/11/2013		82.00		26.00	14.00	614.05	604.23	191.58	103.16	7.31	70.00
2/12/2013		80.00		37.00	8.00	602.70	576.99	267.60	57.86	7.20	71.00
2/13/2013		80.00		43.00	11.00	542.86	521.15	280.12	71.66	7.23	73.00
2/14/2013		88.00		40.00	22.00	569.16	601.03	273.20	150.26	7.24	75.00
2/15/2013						556.50				7.25	75.00
2/16/2013						651.72				7.05	73.00
2/17/2013		1,300.00	74.00	16.00	11.00	619.85	550.43	119.01	81.82	7.14	70.00
2/18/2013		74.00		27.00	10.00	573.71	509.45	185.88	68.85	7.22	73.00
2/19/2013		75.00		27.00	10.00	557.18	501.46	180.53	66.85	7.16	70.00
2/20/2013		70.00		26.00	14.00	426.94	358.63	133.21	71.73	7.22	68.00
2/21/2013		300.00	72.00	25.00	7.60	425.21	367.38	127.56	38.76	7.22	71.00
2/22/2013						464.58				7.16	74.00
2/23/2013						464.02				7.18	74.00
2/24/2013		65.00		18.00	5.60	480.79	375.02	109.62	32.31	7.10	74.00
2/25/2013		60.00		35.00	4.00	521.41	375.42	218.99	25.03	7.08	73.00

2/26/2013						80.00	52.00	14.00	528.16	507.03	329.57	88.73	7.17	77.00
2/27/2013						64.00	50.00	11.00	505.74	388.41	303.44	66.76	7.33	75.00
2/28/2013						54.00	35.00	7.20	440.82	285.65	185.14	38.09	7.30	75.00
3/1/2013									483.23				7.35	73.00
3/2/2013									452.39				7.30	73.00
3/3/2013						38.00	40.00	9.20	484.24	220.81	232.44	53.46	7.26	73.00
3/4/2013	15.00				300.00	33.00	44.00	10.00	483.27	191.37	255.17	57.99	7.31	72.00
3/5/2013						32.00	26.00	10.00	478.08	183.58	149.16	57.37	7.25	72.00
3/6/2013						35.00	120.00	4.00	427.27	179.45	615.27	20.51	7.22	74.00
3/7/2013						39.00	110.00	12.00	429.00	200.77	566.28	61.78	7.41	76.00
3/8/2013									443.42				7.25	73.00
3/9/2013									484.79				7.33	75.00
3/10/2013						42.00	110.00	15.00	437.25	220.37	577.17	78.71	7.28	77.00
3/11/2013						44.00	57.00	14.00	427.44	225.69	292.37	71.81	7.20	73.00
3/12/2013						42.00	56.00	33.00	442.99	223.27	297.69	175.42	7.54	70.00
3/13/2013						42.00	56.00	37.00	405.91	204.58	272.77	180.22	7.61	68.00
3/14/2013						39.00	66.00	260.00	411.43	192.55	325.85	1,283.66	7.56	70.00
3/15/2013									386.61				7.57	75.00
3/16/2013									348.00				7.63	77.00
3/17/2013						42.00	37.00	18.00	485.37	244.63	215.50	104.84	7.94	76.00
3/18/2013						48.00	26.00	9.60	566.12	326.09	176.63	65.22	7.69	75.00
3/19/2013						64.00	24.00	22.00	573.20	440.22	165.08	151.32	7.48	71.00
3/20/2013						66.00	23.00	34.00	511.59	405.18	141.20	208.73	7.43	70.00
3/21/2013	10.00	5.00	5.00	5.00	540.00	72.00	14.00	22.00	444.30	383.88	74.64	117.30	7.65	71.00
3/22/2013									400.41				7.11	70.00
3/23/2013									521.85				7.79	74.00
3/24/2013						100.00	9.90	16.00	542.77	651.32	64.48	104.21	7.43	74.00
3/25/2013						90.00	7.10	27.00	483.01	521.65	41.15	156.50	7.79	73.00
3/26/2013						87.00	8.90	6.40	435.30	454.45	46.49	33.43	7.75	77.00
3/27/2013						77.00	6.60	6.80	475.56	439.42	37.66	38.81	7.72	79.00

3/28/2013		71.00		5.80	14.00	451.13	384.36	36.81	75.79	7.77	79.00	0.10
3/29/2013						479.38				7.69	79.00	
3/30/2013						509.19				7.61	80.00	
3/31/2013		61.00		4.00	7.60	494.23	361.78	23.72	45.07	7.59	77.00	
4/1/2013		70.00		5.00	6.00	504.65	423.91	30.28	36.33	7.58	74.00	
4/2/2013		74.00		5.20	4.00	494.27	436.81	30.84	23.72	7.55	74.00	
4/3/2013		78.00		4.00	4.00	510.73	478.04	24.52	24.52	7.52	74.00	
4/4/2013		83.00		5.20	5.60	499.67	497.67	31.18	33.58	7.62	74.00	
4/5/2013						454.29				7.89	77.00	
4/6/2013						535.61				7.45	77.00	
4/7/2013		76.00		7.40	10.00	539.82	492.32	47.94	64.76	7.50	77.00	
4/8/2013	45.00	20,000.00	60.00	17.00	4.40	576.81	415.30	117.67	30.46	7.28	77.00	
4/9/2013		54.00		19.00	7.60	579.81	375.72	132.20	52.88	7.49	77.00	
4/10/2013		51.00		18.00	4.00	587.75	359.70	126.95	28.21	7.36	75.00	
4/11/2013		48.00		18.00	6.80	496.84	286.18	107.32	40.54	7.39	72.00	
4/12/2013						566.17				7.38	75.00	
4/13/2013						434.14				7.16	77.00	
4/14/2013		54.00		28.00	4.60	482.57	312.71	162.14	27.80	6.95	79.00	
4/15/2013		62.00		19.00	7.60	566.17	421.23	129.09	51.63	7.28	80.00	
4/16/2013		70.00		18.00	4.80	345.05	289.85	74.53	19.88	7.32	80.00	
4/17/2013		76.00		36.00	16.00	429.39	401.91	185.50	82.44	7.57	82.00	
4/18/2013		47.00		35.00	12.00	778.68	439.18	327.05	112.13	8.09	79.00	
4/19/2013						787.34				7.37	74.00	
4/20/2013						726.55				7.64	74.00	
4/21/2013		61.00		53.00	4.00	758.15	554.97	482.18	36.39	7.33	72.00	
4/22/2013		60.00		51.00	6.00	726.55	523.12	444.65	52.31	7.35	81.00	
4/23/2013	5.00	14,000.00	59.00	0.009	40.00	6.00	549.56	389.09	263.79	39.57	7.44	79.00
4/24/2013		67.00		39.00	15.00	477.62	384.01	223.53	85.97	7.49	77.00	
4/25/2013		68.00		52.00	15.00	574.18	468.53	358.29	103.35	7.60	77.00	
4/26/2013						579.71				6.43	73.00	

4/27/2013					723.39				7.58	75.00		
4/28/2013			90.00		35.00	5.60	649.90	701.89	272.96	43.67	7.54	77.00
4/29/2013			88.00		21.00	6.00	626.57	661.66	157.90	45.11	7.59	78.00
4/30/2013			93.00		9.10	14.00	589.00	635.00	62.13	95.59	7.62	78.00
5/1/2013			96.00		12.00	9.80	554.91	639.26	79.91	63.93	7.62	74.00
5/2/2013			100.00		30.00	12.00	553.76	564.51	199.35	79.74	7.75	78.00
5/3/2013							650.01				7.61	79.00
5/4/2013							470.34				7.59	79.00
5/5/2013			100.00		44.00	24.00	514.18	617.02	271.49	148.08	7.48	77.00
5/6/2013			120.00		49.00	15.00	519.09	747.49	305.22	93.44	7.65	79.00
5/7/2013			130.00		43.00	13.00	596.94	931.23	308.02	93.12	7.60	79.00
5/8/2013			130.00		45.00	16.00	559.71	873.15	302.24	107.46	7.69	80.00
5/9/2013			130.00		37.00	8.00	458.63	715.46	203.63	44.03	7.67	82.00
5/10/2013							456.82				7.65	79.00
5/11/2013							522.11				7.63	79.00
5/12/2013			120.00		37.00	26.00	556.28	801.04	246.99	173.56	7.54	77.00
5/13/2013	1.00	1.00	27.00	120.00	67.00	48.00	471.73	579.29	379.27	271.72	7.54	77.00
5/14/2013				120.00	63.00	18.00	495.49	713.51	374.59	107.03	7.54	77.00
5/15/2013				120.00	65.00	39.00	603.26	888.69	470.54	282.33	7.60	79.00
5/16/2013				120.00	52.00	23.00	457.61	659.25	285.67	126.36	7.57	78.00
5/17/2013							517.23				7.56	79.00
5/18/2013							400.19				7.55	80.00
5/19/2013			110.00		50.00	12.00	376.51	496.99	225.91	54.22	7.54	78.00
5/20/2013			110.00		64.00	10.00	560.85	740.32	430.73	67.30	7.57	80.00
5/21/2013			110.00		66.00	4.00	642.63	848.27	431.85	30.85	7.70	80.00
5/22/2013			99.00		43.00	7.20	506.78	602.05	261.50	43.79	7.55	80.00
5/23/2013			96.00		34.00	5.60	487.54	561.65	198.92	32.76	7.56	79.00
5/24/2013							537.65				7.10	82.00
5/25/2013							559.29				7.57	77.00
5/26/2013			92.00		50.00	4.00	572.54	632.08	343.52	27.48	7.47	75.00

5/27/2013			98.00		54.00	42.00	511.21	601.18	331.26	257.65	7.50	78.00	
5/28/2013			88.00		58.00	12.00	606.86	642.96	423.77	67.68	7.49	78.00	
5/29/2013			86.00		47.00	20.00	635.10	655.42	358.20	152.42	7.49	78.00	
5/30/2013			84.00		37.00	12.00	506.66	510.71	224.96	72.96	7.46	79.00	
5/31/2013							568.60				7.52	78.00	
6/1/2013							661.31				7.43	77.00	
6/2/2013			74.00		29.00	4.00	627.71	557.41	218.44	30.13	7.40	77.00	
6/3/2013	1.80	1.00	180.00	67.00	30.00	7.20	590.42	474.70	212.55	51.01	7.46	75.00	
6/4/2013				69.00	25.00	4.00	575.75	476.72	179.63	27.64	7.50	75.00	
6/5/2013				78.00	15.00	18.00	615.06	575.70	110.71	132.85	7.50	77.00	
6/6/2013				86.00	6.60	5.20	607.03	626.45	48.08	37.88	7.55	78.00	
6/7/2013							580.77				7.56	81.00	
6/8/2013							615.75				7.59	81.00	
6/9/2013				73.00	10.00	4.80	658.52	576.86	79.02	37.93	7.69	81.00	
6/10/2013				61.00	23.00	9.20	613.88	596.69	169.43	67.77	7.49	81.00	
6/11/2013				74.00	34.00	4.40	597.91	530.94	243.95	31.57	7.48	78.00	
6/12/2013				70.00	36.00	5.60	681.96	572.85	294.61	45.83	7.55	80.00	
6/13/2013				66.00	27.00	6.40	637.71	505.07	206.62	48.98	7.52	79.00	
6/14/2013							630.11				7.27	80.00	
6/15/2013							603.50				7.65	78.00	
6/16/2013				63.00	9.80	4.00	534.40	404.01	62.85	25.65	7.66	80.00	
6/17/2013				61.00	6.60	4.00	558.56	408.87	44.24	26.81	7.58	82.00	
6/18/2013				68.00	6.30	4.00	587.08	479.06	44.38	28.18	7.62	82.00	
6/19/2013				69.00	4.60	4.00	587.42	486.38	32.43	28.20	7.64	82.00	0.10
6/20/2013				70.00	6.00	4.00	603.95	507.32	43.48	28.99	7.63	80.00	
6/21/2013							701.23				7.61	82.00	0.10
6/22/2013							635.21				7.59	82.00	
6/23/2013				75.00	6.30	33.00	626.84	571.68	47.39	248.23	7.59	80.00	
6/24/2013				67.00	8.30	33.00	547.52	440.21	54.53	216.82	7.60	80.00	
6/25/2013				66.00	11.00	24.00	476.26	377.20	62.87	137.16	7.58	80.00	

6/26/2013			61.00		7.00	11.00	559.63	409.65	47.01	73.87	7.57	80.00
6/27/2013			60.00		7.30	50.00	574.73	413.81	50.35	344.84	7.62	81.00
6/28/2013							586.94				7.75	84.00
6/29/2013							365.60				7.58	75.00
6/30/2013			63.00	0.000	21.00	12.00	483.20	395.30	121.77	69.58	7.75	80.00
7/1/2013			64.00		23.00	6.40	492.15	377.97	135.83	37.80	7.83	79.00
7/2/2013			62.00		32.00	4.00	570.34	424.33	219.01	27.38	7.68	79.00
7/3/2013			66.00		27.00	4.00	576.57	456.64	186.81	27.68	7.71	82.00
7/4/2013			64.00		31.00	58.00	520.16	399.48	193.50	362.03	7.72	80.00
7/5/2013							461.39				7.69	80.00
7/6/2013							559.20				7.75	82.00
7/7/2013			73.00		29.00	44.00	598.49	524.28	205.27	316.00	7.74	82.00
7/8/2013	3.40	1.00	2,900.00	70.00	26.00	25.00	610.23	512.59	190.39	183.07	7.75	82.00
7/9/2013				74.00	28.00	9.20	569.62	505.82	191.39	62.89	7.74	82.00
7/10/2013				80.00	21.00	11.00	572.11	549.23	144.17	75.52	7.73	84.00
7/11/2013				85.00	23.00	12.00	579.41	591.00	159.92	83.44	7.76	84.00
7/12/2013							593.03				7.74	81.00
7/13/2013							591.12				7.82	80.00
7/14/2013				86.00	4.00	4.00	544.14	365.86	26.12	26.12	7.83	82.00
7/15/2013				84.00	4.00	6.40	567.47	367.72	27.24	43.58	7.61	81.00
7/16/2013				82.00	4.90	4.00	567.47	354.10	33.37	27.24	7.41	86.00
7/17/2013				80.00	7.10	4.00	512.60	307.56	43.67	24.60	7.41	86.00
7/18/2013				49.00	5.00	8.00	536.83	315.66	32.21	51.54	7.59	88.00
7/19/2013							546.86				7.52	86.00
7/20/2013							539.58				7.56	86.00
7/21/2013			60,000.00	58.00	9.20	8.00	499.91	335.94	55.19	47.99	7.55	86.00
7/22/2013				80.00	12.00	4.40	530.22	381.76	76.35	28.00	7.88	80.00
7/23/2013				65.00	12.00	4.40	611.47	476.95	88.05	32.29	7.64	80.00
7/24/2013				68.00	7.20	4.00	512.39	418.11	44.27	24.59	7.67	82.00
7/25/2013				71.00	5.40	4.00	531.21	452.59	34.42	25.50	7.80	82.00

7/26/2013						580.22				7.66	80.00	
7/27/2013						537.89				8.40	82.00	
7/28/2013		3,500.00	70.00		4.00	4.00	645.08	541.87	30.96	30.96	7.63	80.00
7/29/2013			67.00		4.60	4.00	655.05	526.66	36.16	31.44	7.50	80.00
7/30/2013			72.00		4.00	4.00	665.05	574.60	31.92	31.92	7.55	80.00
7/31/2013			70.00		4.90	4.00	608.47	511.11	35.78	29.21	7.34	80.00
8/1/2013			78.00		4.80	4.00	616.70	577.23	35.52	29.60	7.52	80.00
8/2/2013						670.04					7.45	80.00
8/3/2013						686.28					7.33	80.00
8/4/2013			75.00		7.10	4.00	683.56	615.20	58.24	32.81	7.47	79.00
8/5/2013			75.00		4.00	10.00	723.22	650.90	34.71	86.79	7.42	80.00
8/6/2013			78.00		4.00	12.00	640.51	599.52	30.74	92.23	7.33	80.00
8/7/2013			72.00		4.00	9.60	725.11	626.50	34.81	83.53	7.41	80.00
8/8/2013			64.00		4.00	16.00	728.98	559.86	34.99	139.96	7.11	82.00
8/9/2013						745.79					7.27	80.00
8/10/2013						781.52					7.30	80.00
8/11/2013	1.00	1.00	60,000.00	63.00	10.00	7.60	684.49	517.47	82.14	62.43	7.18	80.00
8/12/2013				70.00	4.00	7.20	704.38	591.68	33.81	60.86	7.28	86.00
8/13/2013				72.00	4.40	5.20	546.75	472.39	28.87	34.12	7.23	82.00
8/14/2013				72.00	4.00	11.00	608.67	525.89	29.22	80.34	7.19	82.00
8/15/2013			60,000.00	75.00	6.40	11.00	646.31	581.68	49.64	85.31	6.90	84.00
8/16/2013						669.53					7.22	82.00
8/17/2013						683.45					7.31	82.00
8/18/2013				94.00	11.00	14.00	706.69	797.15	93.28	118.72	7.15	80.00
8/19/2013				92.00	5.00	14.00	710.79	784.71	42.65	119.41	7.19	82.00
8/20/2013				86.00	5.60	9.20	689.37	711.43	46.33	76.11	6.96	80.00
8/21/2013				82.00	25.00	13.00	726.63	715.00	217.99	113.35	6.99	80.00
8/22/2013				82.00	28.00	12.00	675.97	685.15	227.13	97.34	7.13	80.00
8/23/2013						569.09					7.02	80.00
8/24/2013						634.22					6.68	82.00

8/25/2013			80.00			22.00	34.00	657.28	630.99	173.52	268.17	6.83	82.00		
8/26/2013			82.00			20.00	34.00	618.14	608.25	148.35	252.20	6.76	86.00		
8/27/2013			78.00			26.00	33.00	637.50	596.70	196.90	252.45	6.83	86.00		
8/28/2013			70.00			8.30	22.00	612.79	514.74	61.03	161.76	7.11	84.00		
8/29/2013			80.00			28.00	96.00	603.26	434.35	202.70	694.96	7.43	84.00		
8/30/2013								591.50				8.01	82.00		
8/31/2013								532.11				7.72	84.00		
9/1/2013			30.00			39.00	10.00	619.59	295.05	383.57	96.35	7.41	81.00		
9/2/2013			27.00			47.00	12.00	736.37	238.58	415.31	106.04	7.30	77.00		
9/3/2013			25.00			82.00	9.60	692.02	-207.61	680.95	79.72	7.34	75.00		
9/4/2013			26.00			84.00	13.00	627.42	195.76	632.44	97.88	7.33	75.00		
9/5/2013			26.00			34.00	23.00	667.50	208.26	272.34	184.23	7.40	76.00		
9/6/2013								720.21				6.89	82.00		
9/7/2013								712.39				6.53	84.00		
9/8/2013	3.20	1.00	60,000.00	26.00		56.00	120.00	729.92	227.74	490.51	1,051.08	6.64	84.00		
9/9/2013				31.00		68.00	37.00	701.54	260.97	572.46	311.48	7.40	84.00		
9/10/2013				28.00		74.00	18.00	685.93	230.47	609.11	148.16	7.03	86.00		
9/11/2013				23.00		110.00	23.00	725.82	200.33	958.06	200.33	7.07	86.00		
9/12/2013				19.00		110.00	21.00	748.33	170.62	987.80	188.58				
9/13/2013								667.22				7.05	79.00		
9/14/2013								684.03				6.80	86.00		
9/15/2013				15.00		55.00	35.00	729.93	131.39	481.75	306.57	7.10	75.00		
9/16/2013			500.00	12.00		69.00	34.00	687.10	98.94	568.92	280.34	7.19	74.00	0.10	
9/17/2013				14.00		120.00	37.00	671.94	112.89	967.59	298.34	7.21	74.00		
9/18/2013				15.00		50.00	18.00	663.15	119.37	397.89	143.24	7.20	72.00		
9/19/2013				16.00		56.00	19.00	734.66	141.05	493.69	167.50	7.10	77.00		
9/20/2013								743.00				7.38	75.00		
9/21/2013								610.39				7.37	71.00		
9/22/2013				14.00		32.00	4.80	636.39	106.91	244.37	36.66	7.27	70.00		
9/23/2013				14.00		57.00	110.00	681.30	114.46	466.01	689.32	7.32	71.00		

9/24/2013		13.00		21.00	28.00	696.87	108.71	175.61	234.15	7.49	75.00
9/25/2013		12.00		51.00	49.00	689.85	99.34	422.19	405.63	7.59	75.00
9/26/2013		12.00		33.00	52.00	723.85	104.23	286.64	451.68	7.49	75.00
9/27/2013						687.10				7.48	73.00
9/28/2013						683.39				7.36	75.00
9/29/2013		13.00		17.00	50.00	677.13	105.63	138.13	406.28	7.26	77.00
9/30/2013		16.00		16.00	67.00	613.77	117.84	117.84	493.47	7.46	77.00
10/1/2013		20.00		12.00	84.00	672.66	161.44	96.86	678.04	7.56	80.00
10/2/2013		23.00		10.00	87.00	700.84	193.43	84.10	731.68	7.57	80.00
10/3/2013		24.00		16.00	73.00	729.49	210.09	140.06	639.03	7.60	80.00
10/4/2013						680.42				7.45	82.00
10/5/2013						727.05				7.70	82.00
10/6/2013		26.00		10.00	67.00	713.55	222.63	85.63	573.69	7.66	79.00
10/7/2013		29.00		28.00	34.00	718.16	249.92	241.30	293.01	7.65	77.00
10/8/2013		26.00		25.00	31.00	694.60	216.72	208.38	258.39	7.54	79.00
10/9/2013		27.00		4.00	54.00	714.97	231.65	34.32	463.30	7.61	81.00
10/10/2013		32.00		9.00	51.00	752.61	289.00	81.28	460.60	7.64	79.00
10/11/2013						666.19				7.57	79.00
10/12/2013						743.18				7.31	80.00
10/13/2013	60,000.00	23.00		16.00	14.00	761.23	210.10	146.16	127.89	7.45	75.00
10/14/2013		23.00		8.00	4.00	672.98	185.74	64.61	32.30	7.49	64.00
10/15/2013		23.00		13.00	4.00	680.13	187.72	106.10	32.65	7.55	68.00
10/16/2013		26.00		12.00	4.00	659.70	205.83	95.00	31.67	7.43	73.00
10/17/2013		26.00		14.00	4.00	642.26	200.39	107.90	30.83	7.50	72.00
10/18/2013						616.39				7.34	72.00
10/19/2013						516.94				7.51	75.00
10/20/2013		26.00		11.00	4.00	491.34	153.30	64.86	23.58	7.50	82.00
10/21/2013	81.00	25.00		50.00	4.00	561.71	168.51	337.03	26.96	7.24	80.00
10/22/2013		20.00		29.00	4.00	635.03	152.41	220.99	30.48	7.25	79.00
10/23/2013		16.00		15.00	4.00	633.60	121.65	114.05	30.41	7.31	75.00

10/24/2013		12.00		12.00	4.00	578.58	83.32	83.32	27.77	6.52	80.00
10/25/2013						538.03				6.90	79.00
10/26/2013						597.02				6.89	79.00
10/27/2013		16.00		11.00	4.00	626.05	120.20	82.64	30.05	6.95	75.00
10/28/2013		16.00		16.00	4.00	624.59	119.92	119.92	29.98	6.79	78.00
10/29/2013		25.00		16.00	4.00	617.94	185.38	118.64	29.66	6.87	76.00
10/30/2013		35.00		23.00	4.00	596.75	250.64	164.70	28.64	6.92	79.00
10/31/2013		34.00		15.00	4.00	630.05	257.06	113.41	30.24	6.93	82.00
11/1/2013						650.64				6.97	80.00
11/2/2013						650.28				6.88	77.00
11/3/2013	36.00	37.00		15.00	6.40	637.72	283.15	114.79	48.98	7.00	80.00
11/4/2013		34.00		19.00	4.00	638.37	260.45	145.55	30.64	6.88	77.00
11/5/2013	21.00	1.00	31.00	11.00	4.00	634.03	235.86	83.69	30.43	6.90	80.00
11/6/2013		29.00		4.40	4.00	644.67	224.35	34.04	30.94	6.91	80.00
11/7/2013		32.00		7.10	4.00	647.87	248.78	55.20	31.10	6.84	77.00
11/8/2013						640.91				6.99	71.00
11/9/2013						627.92				7.04	77.00
11/10/2013		46.00		4.00	4.00	594.36	328.09	28.53	28.53	7.11	77.00
11/11/2013		45.00		4.00	4.00	594.36	320.95	28.53	28.53	7.00	77.00
11/12/2013		47.00		5.50	4.00	551.41	311.00	36.39	26.47	7.13	72.00
11/13/2013		49.00		5.60	4.00	563.13	331.12	37.84	27.03	6.80	75.00
11/14/2013		56.00		8.30	4.00	594.42	399.45	59.20	28.53	6.87	72.00
11/15/2013						618.24				6.77	72.00
11/16/2013						641.57				6.91	72.00
11/17/2013		61.00		4.00	4.00	642.48	470.30	30.84	30.84	7.08	72.00
11/18/2013		68.00		12.00	4.00	555.43	453.23	79.98	26.66	7.08	72.00
11/19/2013		64.00		10.00	4.00	622.61	478.16	74.71	29.89	6.61	72.00
11/20/2013		55.00		7.20	4.00	621.86	410.43	53.73	29.85	6.67	72.00
11/21/2013		50.00		9.80	4.00	631.22	378.73	74.23	30.30	7.16	72.00
11/22/2013						649.18				7.00	70.00

11/23/2013					588.87			7.09	70.00		
11/24/2013		46.00		6.00	4.00	408.43	225.45	29.41	19.60	7.00	70.00
11/25/2013		52.00		12.00	15.00	565.44	352.83	81.42	101.78	6.98	70.00
11/26/2013		54.00		13.00	4.00	561.81	364.05	87.64	26.97	6.97	70.00
11/27/2013		59.00		5.10	8.80	471.95	334.14	28.88	49.84	6.51	70.00
11/28/2013		57.00		4.00	8.80	517.16	353.74	24.82	54.61	7.20	68.00
11/29/2013						605.61				7.30	68.00
11/30/2013						581.02				7.15	70.00
12/1/2013	1.00	1.80				45.00					
12/2/2013			27.00			41.00					
12/3/2013						44.00					
12/4/2013						48.00					
12/5/2013						49.00					
12/6/2013											
12/7/2013											
12/8/2013											
12/9/2013											
12/10/2013											
12/11/2013											
12/12/2013											
12/13/2013											
12/14/2013											
12/15/2013											
12/16/2013											
12/17/2013											
12/18/2013											
12/19/2013											
12/20/2013											
12/21/2013											
12/22/2013											

12/23/2013					70.00				4.20	5.60	686.16	576.37	34.58	46.11	6.33	70.00	
12/24/2013					65.00				4.30	5.20	438.13	341.74	22.61	27.34	6.54	68.00	
12/25/2013					58.00				4.00	4.00	549.95	382.77	26.40	26.40	6.40	68.00	
12/26/2013					50.00				4.00	4.40	666.37	399.82	31.99	35.18	6.47	68.00	
12/27/2013											651.00				6.33	70.00	
12/28/2013											602.89				6.52	70.00	
12/29/2013					36.00				4.00	4.00	554.14	239.39	26.60	26.60	6.74	70.00	
12/30/2013					26.00				4.00	9.20	467.09	145.73	22.42	51.57	6.38	68.00	
12/31/2013					26.00				4.00	4.00	209.83	70.50	10.07	10.07	6.76	70.00	
<b>Avg</b>	8.415	1.600	5.000	5.000	*****	62.465	0.009	0.000	22.520	15.138	594.357	439.707	158.445	109.173	7.302	76.507	0.100
<b>Min</b>	1.000	1.000	5.000	5.000	27.000	12.000	0.009	0.000	4.000	4.000	209.830	70.503	10.072	10.072	6.270	61.000	0.100
<b>Max</b>	45.000	5.000	5.000	5.000	*****	160.000	0.009	0.000	120.000	260.000	819.590	1,050.298	987.796	1,263.662	8.400	88.000	0.100
<b>Sum</b>												*****					
<b>30-Day AVG/</b>	<i>48/</i>	<i>21/</i>							<i>28/</i>	<i>25/</i>	<i>636.81</i>		<i>183.5/</i>	<i>229.3/</i>	<i>6/</i>		
<b>Daily MAX</b>	<i>89</i>	<i>46</i>			<i>400</i>	<i>155</i>			<i>48</i>	<i>58</i>	<i>1848.6</i>		<i>477</i>	<i>596.3</i>	<i>9</i>		

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2014

End Date: 12/31/2014

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (#/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (parts/100M)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Plant Effluent Flow (gpm)	Ammonia Load (lb/day)	Total Nitrogen (lb/day)	tBOD Load (lb/day)	TSS Load (lb/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2014						29.00				4.00	4.00	132.12	45.98		6.34	6.34	6.53	72.00				
1/2/2014						30.00				4.00	4.00	122.18	43.98		5.86	5.86	6.51	70.00				
1/3/2014												54.24					7.00	68.00				
1/4/2014												478.24					6.70	74.00				
1/5/2014						38.00				4.00	4.00	643.03	293.22		30.87	30.87	6.87	70.00				
1/6/2014						46.00				4.00	4.00	83.45	46.06		4.01	4.01	6.98	66.00				
1/7/2014						46.00				4.00	4.00	47.60	26.28		2.28	2.28	6.38	68.00				
1/8/2014	1.00	1.00			160.00	46.00				4.00	4.00	261.44	144.31		12.55	12.55	6.17	72.00				
1/9/2014						46.00				4.00	4.00	347.78	191.97		16.69	16.69	6.25	81.00				
1/10/2014												516.68					6.40	80.00				
1/11/2014												578.77					6.45	79.00				
1/12/2014						45.00				4.00	4.00	539.32	291.23		25.89	25.89	6.80	75.00				
1/13/2014						50.00				4.00	5.60	450.87	270.52		21.64	30.30	6.90	77.00				
1/14/2014						52.00				4.00	7.60	574.94	358.70		27.59	52.43	6.96	75.00				
1/15/2014						51.00				4.00	4.40	614.11	375.84		29.46	32.43	6.95	75.00				
1/16/2014						49.00				28.00	4.00	550.60	323.75		185.00	26.43	7.02	75.00				
1/17/2014												621.41					6.55	73.00				
1/18/2014												668.73					6.88	77.00				
1/19/2014						42.00				4.00	4.00	612.54	308.72		29.40	29.40	6.49	73.00				
1/20/2014						50.00				4.00	4.00	554.44	332.66		26.61	26.61	6.86	77.00				
1/21/2014						49.00				4.00	4.00	542.41	318.94		26.04	26.04	6.35	75.00				
1/22/2014						53.00				4.00	4.00	360.77	229.45		17.32	17.32	6.87	79.00				
1/23/2014						54.00				4.00	4.00	399.40	258.61		19.17	19.17	6.81	73.00				
1/24/2014												430.50					6.69	70.00				
1/25/2014												457.85					6.62	70.00				
1/26/2014						62.00				5.30	4.00	472.11	351.25		30.03	22.66	6.77	70.00				

1/27/2014		58.00		4.00	4.80	438.80	305.40	21.06	25.27	6.94	70.00
1/28/2014		62.00		4.00	4.00	455.73	339.06	21.88	21.86	6.79	70.00
1/29/2014		66.00		4.00	4.00	493.47	390.83	23.69	23.69	7.04	70.00
1/30/2014		60.00		4.00	5.60	487.80	351.22	23.41	32.78	6.63	70.00
1/31/2014						485.16				8.77	70.00
2/1/2014						463.26				6.90	70.00
2/2/2014		60.00		4.00	4.00	466.50	335.88	22.39	22.39	7.04	70.00
2/3/2014		68.00		4.00	4.00	472.58	385.63	22.68	22.68	7.10	69.00
2/4/2014	1.00	66.00	0.404	4.00	4.00	495.67	392.57	23.79	23.79	7.03	68.00
2/5/2014		64.00		4.00	4.00	499.02	383.25	23.95	23.95	7.09	68.00
2/6/2014		61.00		4.00	4.00	498.30	364.76	23.92	23.92	7.01	68.00
2/7/2014		540.00				501.69				6.99	70.00
2/8/2014						504.62				6.74	70.00
2/9/2014		57.00		4.00	4.00	514.53	351.94	24.70	24.70	6.74	78.00
2/10/2014		60.00		4.00	4.00	503.28	301.97	24.16	24.16	7.23	76.00
2/11/2014		49.00		4.00	4.00	414.95	243.99	19.92	19.92	7.23	74.00
2/12/2014		50.00		4.00	6.00	344.96	206.98	16.56	24.84	7.21	70.00
2/13/2014		52.00		4.00	4.00	488.10	304.57	23.43	23.43	7.56	70.00
2/14/2014		270.00				479.34				7.31	75.00
2/15/2014						424.15				6.89	70.00
2/16/2014		66.00		4.00	7.50	432.73	342.72	20.77	39.46	6.65	77.00
2/17/2014		71.00		4.00	6.00	404.32	344.48	19.41	29.11	7.32	70.00
2/18/2014		66.00		4.00	11.00	466.54	369.50	22.39	61.58	7.50	70.00
2/19/2014		58.00		4.00	11.00	522.97	363.99	25.10	69.03	7.40	70.00
2/20/2014		54.00		4.00	6.00	510.01	330.49	24.48	36.72	7.27	70.00
2/21/2014						493.97				7.20	67.00
2/22/2014						486.75				7.34	70.00
2/23/2014		68.00		4.00	4.00	456.88	372.81	21.93	21.93	6.98	77.00
2/24/2014		80.00		4.00	4.00	433.48	416.14	20.81	20.81	7.57	79.00
2/25/2014		86.00		4.50	4.40	454.65	469.20	24.55	24.01	7.61	75.00

2/26/2014						95.00			4.00	4.00	440.57	502.25	21.15	21.15	7.30	66.00
2/27/2014						100.00			4.00	4.00	393.94	472.73	18.91	18.91	7.10	73.00
2/28/2014											212.35				7.20	74.00
3/1/2014											398.65				7.40	70.00
3/2/2014						87.00	0.386		4.00	5.60	329.45	343.95	15.81	22.14	7.12	70.00
3/3/2014	5.00	5.00	5.00	5.00	10.00	69.00	0.010		4.00	4.40	150.11	124.29	7.21	7.93	7.22	70.00
3/4/2014						64.00			4.00	4.00	406.89	312.49	19.53	19.53	7.18	77.00
3/5/2014						64.00			4.10	4.40	346.58	266.17	17.05	18.30	7.03	79.00
3/6/2014						64.00			8.00	4.00	449.02	344.85	43.11	21.55	7.12	79.00
3/7/2014											401.83				7.63	70.00
3/8/2014											438.41				7.17	70.00
3/9/2014						68.00			5.60	4.00	433.34	353.61	29.12	20.80	7.47	70.00
3/10/2014						70.00			4.00	7.60	442.54	371.73	21.24	40.36	7.42	73.00
3/11/2014						72.00			4.20	16.00	458.49	396.14	23.11	88.03	7.52	73.00
3/12/2014						68.00			4.50	15.00	405.85	331.17	21.92	73.05	7.60	70.00
3/13/2014						70.00			4.80	16.00	401.32	337.11	23.12	77.05	7.40	68.00
3/14/2014											450.37				7.37	77.00
3/15/2014											502.71				7.62	79.00
3/16/2014						110.00			7.50	23.00	434.06	572.96	39.07	119.80	7.84	73.00
3/17/2014						88.00			8.40	20.00	399.94	422.34	40.31	95.99	7.69	70.00
3/18/2014						84.00			8.00	28.00	469.29	473.04	45.05	157.68	7.71	69.00
3/19/2014						80.00			9.10	39.00	473.16	454.25	51.67	221.45	7.63	70.00
3/20/2014						75.00			8.20	38.00	448.32	403.49	44.11	204.43	7.63	70.00
3/21/2014											442.91				7.57	77.00
3/22/2014											457.98				7.20	77.00
3/23/2014						76.00			6.30	30.00	452.74	412.90	34.23	162.99	7.67	77.00
3/24/2014						80.00			4.20	14.00	456.73	438.46	23.02	76.73	7.40	77.00
3/25/2014						80.00			6.70	17.00	440.57	422.95	35.42	89.88	7.73	77.00
3/26/2014						84.00			4.50	10.00	435.86	439.35	23.54	52.30	7.67	75.00
3/27/2014						84.00			3.50	12.00	425.52	426.92	28.08	61.27	7.71	77.00

0.20

3/28/2014					420.16				7.73	76.00
3/29/2014					431.59				7.77	69.00
3/30/2014		91.00	4.00	4.00	441.14	481.72	21.17	21.17	7.74	76.00
3/31/2014		91.00	4.00	4.40	468.76	511.89	22.50	24.75	7.71	76.00
4/1/2014		91.00	4.00	6.40	565.33	617.34	27.14	56.99	7.66	74.00
4/2/2014		86.00	4.00	4.30	541.34	558.66	25.98	27.93	7.81	76.00
4/3/2014		80.00	4.00	4.40	423.69	406.74	20.34	22.37	7.76	76.00
4/4/2014					441.46				7.69	70.00
4/5/2014					457.17				7.49	75.00
4/6/2014	1.00	74.00	4.00	4.00	470.87	418.13	22.60	22.60	7.58	75.00
4/7/2014		74.00	4.00	5.60	473.56	420.52	22.73	31.82	7.53	76.00
4/8/2014		78.00	4.40	6.40	447.39	418.76	23.62	34.36	7.61	70.00
4/9/2014		86.00	4.00	9.20	590.93	609.84	28.36	65.24	7.50	70.00
4/10/2014		86.00	4.00	4.00	734.26	757.76	35.24	35.24	7.67	78.00
4/11/2014		10.00			667.56				7.32	81.00
4/12/2014					663.49				7.55	81.00
4/13/2014		85.00	4.00	4.00	715.23	729.53	34.33	34.33	7.78	81.00
4/14/2014		84.00	4.00	4.00	700.00	705.60	33.60	33.60	7.75	70.00
4/15/2014		72.00	4.40	4.00	538.57	465.32	28.44	25.85	7.52	70.00
4/16/2014		65.00	4.00	4.00	697.48	544.03	33.48	33.48	7.08	70.00
4/17/2014		62.00	4.00	4.00	822.05	611.61	39.46	39.46	7.48	72.00
4/18/2014					658.90				7.56	70.00
4/19/2014					733.88				7.67	80.00
4/20/2014		62.00	4.00	4.00	723.32	538.15	34.72	34.72	7.13	73.00
4/21/2014		70.00	4.00	4.00	731.48	614.44	35.11	35.11	7.32	79.00
4/22/2014		74.00	4.00	4.00	205.94	182.67	9.89	9.89	7.48	79.00
4/23/2014		72.00	4.00	4.00	640.89	553.73	30.76	30.76	7.53	79.00
4/24/2014		66.00	4.70	4.00	410.41	325.04	23.15	19.70	7.45	77.00
4/25/2014					402.16				7.50	74.00
4/26/2014					411.54				7.70	80.00

4/27/2014		68.00		4.00	4.00	421.77	344.16	20.24	20.24	7.60	80.00
4/28/2014		69.00		4.00	4.00	426.20	352.89	20.46	20.46	7.84	68.00
4/29/2014		68.00		4.00	4.00	432.94	353.28	20.78	20.78	7.69	78.00
4/30/2014		66.00		4.00	4.00	439.71	348.25	21.11	21.11	7.33	76.00
5/1/2014		64.00		4.00	4.00	448.60	344.52	21.53	21.53	7.29	76.00
5/2/2014						446.61				7.27	76.00
5/3/2014						446.15				7.40	77.00
5/4/2014	2.90	74.00		4.00	4.00	442.85	393.25	21.26	21.26	7.38	79.00
5/5/2014		91.00	64.00	4.60	4.40	419.13	321.89	23.14	22.13	7.37	78.00
5/6/2014		60.00		4.00	4.00	419.36	301.94	20.13	20.13	7.44	77.00
5/7/2014		62.00		4.00	4.00	421.01	313.23	20.21	20.21	7.44	78.00
5/8/2014		77.00		5.40	4.00	410.69	379.48	26.61	19.71	7.58	80.00
5/9/2014						411.60				7.52	86.00
5/10/2014						420.45				7.48	84.00
5/11/2014		86.00		4.00	4.00	403.44	416.35	19.37	19.37	7.36	86.00
5/12/2014		90.00		4.00	5.60	396.51	428.23	19.03	26.65	7.51	78.00
5/13/2014		90.00		4.00	4.00	407.85	440.48	19.58	19.58	7.45	75.00
5/14/2014		71.00		15.00	4.00	432.43	368.43	77.84	20.76	7.33	75.00
5/15/2014		75.00		5.30	4.00	452.74	407.47	28.79	21.73	7.05	73.00
5/16/2014						435.23				7.29	77.00
5/17/2014						421.40				7.25	75.00
5/18/2014		74.00		4.00	8.80	430.21	382.03	20.65	45.43	7.35	80.00
5/19/2014		74.00		4.80	10.00	436.66	387.75	25.15	52.40	7.54	81.00
5/20/2014		73.00		11.00	16.00	447.76	392.24	59.10	85.97	7.38	84.00
5/21/2014		81.00		7.20	4.40	452.61	439.94	39.11	23.90	7.17	84.00
5/22/2014		90.00		4.20	14.00	397.70	429.52	20.04	66.81	7.37	84.00
5/23/2014						375.71				7.26	80.00
5/24/2014						405.73				7.43	79.00
5/25/2014		80.00		4.00	21.00	471.72	452.85	22.64	118.87	7.27	80.00
5/26/2014		78.00		4.00	19.00	486.45	455.32	23.35	110.91	7.15	80.00

5/27/2014			72.00		4.90	17.00	496.29	428.79	29.18	101.24	7.33	80.00
5/28/2014			60.00		6.60	36.00	526.33	380.40	41.84	228.24	6.89	80.00
5/29/2014			56.00		6.00	44.00	516.68	347.21	37.20	272.81	7.31	79.00
5/30/2014							503.36				7.24	80.00
5/31/2014							476.69				6.88	82.00
6/1/2014	1.00	1.00	72.00		7.80	64.00	461.92	399.10	43.24	354.75	6.77	80.00
6/2/2014			1,500.00	68.00	5.90	23.00	442.25	360.86	31.31	122.06	6.66	79.00
6/3/2014				70.00	7.10	30.00	442.11	371.37	37.67	159.16	6.77	79.00
6/4/2014				76.00	8.70	18.00	400.57	365.32	41.82	86.52	6.99	80.00
6/5/2014				70.00	6.20	16.00	427.00	358.68	31.77	81.98	7.04	80.00
6/6/2014			370.00				453.78				6.96	84.00
6/7/2014							450.68				6.91	84.00
6/8/2014			63.00		6.10	4.40	442.89	334.82	32.42	23.38	6.90	81.00
6/9/2014			60.00		4.00	11.00	480.86	346.22	23.08	63.47	6.97	75.00
6/10/2014			60.00		4.80	4.00	503.66	362.64	29.01	24.16	7.43	76.00
6/11/2014				54.00	5.00	4.00	499.34	323.57	29.96	23.97	6.88	73.00
6/12/2014				54.00	7.60	4.00	485.01	314.29	44.23	23.28	6.97	79.00
6/13/2014							480.93				7.12	76.00
6/14/2014							434.49				6.83	78.00
6/15/2014			66.00		6.20	8.40	431.46	341.72	32.10	43.49	6.98	77.00
6/16/2014			60.00		4.10	6.40	463.54	333.75	22.81	35.60	6.93	81.00
6/17/2014			61.00		5.90	4.00	480.78	351.93	34.04	23.08	6.87	81.00
6/18/2014			59.00		7.00	4.00	458.40	324.55	38.51	22.00	6.97	84.00
6/19/2014			66.00		6.50	6.20	468.82	382.56	36.57	29.25	7.21	82.00
6/20/2014							465.97				7.27	80.00
6/21/2014							491.22				7.21	80.00
6/22/2014			68.00		4.00	4.00	518.84	423.37	24.90	24.90	7.28	80.00
6/23/2014			76.00		4.00	4.00	425.48	388.04	20.42	20.42	7.34	82.00
6/24/2014			84.00		6.90	4.00	454.39	458.03	37.62	21.81	7.39	81.00
6/25/2014			78.00		6.40	4.00	423.97	396.64	32.56	20.35	7.29	82.00

6/26/2014		78.00		4.00	4.80	376.79	352.88	18.09	21.70	7.12	81.00
6/27/2014						360.16				7.10	80.00
6/28/2014						358.14				6.99	82.00
6/29/2014		70.00		4.00	4.00	315.96	265.41	15.17	15.17	7.03	78.00
6/30/2014		52.00		4.20	6.40	541.88	338.13	27.31	41.62	7.33	82.00
7/1/2014		49.00		4.00	4.00	509.19	299.40	24.44	24.44	7.73	80.00
7/2/2014		41.00		4.00	4.00	552.92	272.04	26.54	26.54	7.35	79.00
7/3/2014		40.00		4.00	4.00	463.01	231.84	23.18	23.18	7.01	75.00
7/4/2014						391.19				7.08	82.00
7/5/2014						403.50				6.78	81.00
7/6/2014	1.30	55.00		4.00	4.00	408.15	289.38	19.59	19.59	6.68	82.00
7/7/2014		500.00	60.00	4.00	5.20	418.61	301.54	20.10	26.13	6.74	79.00
7/8/2014		65.00		4.00	4.40	427.26	333.26	20.51	22.56	7.61	80.00
7/9/2014		65.00		4.00	4.40	420.70	328.15	20.19	22.21	6.67	80.00
7/10/2014		74.00		7.90	4.40	414.21	367.82	39.27	21.87	5.90	79.00
7/11/2014		180.00				411.52				5.97	84.00
7/12/2014						406.51				6.51	82.00
7/13/2014		62.00		4.00	4.00	407.25	302.99	19.55	18.55	6.64	84.00
7/14/2014		81.00		4.00	4.00	434.16	422.02	20.84	20.84	7.03	88.00
7/15/2014		99.00		4.00	4.00	398.50	473.42	19.13	19.13	7.13	82.00
7/16/2014		84.00		4.00	5.60	352.30	355.12	16.91	23.67	6.90	82.00
7/17/2014		73.00		4.00	4.00	350.14	306.72	16.81	16.81	6.86	84.00
7/18/2014						399.00				6.87	82.00
7/19/2014						412.75				6.77	80.00
7/20/2014		91.00		4.00	4.00	409.65	447.34	19.66	19.66	6.77	84.00
7/21/2014		110.00		7.70	4.00	390.12	514.96	36.05	18.73	6.73	84.00
7/22/2014		94.00		11.00	4.00	386.41	438.13	51.27	18.64	6.96	86.00
7/23/2014		99.00		16.00	6.40	343.46	408.03	65.94	26.38	6.70	88.00
7/24/2014		99.00		14.00	5.20	348.89	414.48	58.61	21.77	6.76	88.00
7/25/2014						404.28				6.70	84.00

7/26/2014						390.94				6.50	82.00	
7/27/2014		80.00		7.90	14.00	358.30	343.97	33.97	60.19	6.40	84.00	
7/28/2014		68.00		8.40	4.00	372.68	304.11	37.57	17.89	6.54	79.00	
7/29/2014		64.00		7.00	4.00	381.08	292.87	32.01	18.29	6.50	82.00	
7/30/2014		60.00		6.40	4.00	388.60	286.99	30.61	19.13	6.29	80.00	
7/31/2014		56.00		6.50	4.00	389.92	262.03	39.77	16.72	7.78	80.00	
8/1/2014						386.53				6.43	84.00	
8/2/2014						380.95				6.62	85.00	
8/3/2014	2.10	16,000.00	60.00		13.00	4.00	373.85	269.17	58.32	17.94	6.85	84.00
8/4/2014		17,000.00	62.00		11.00	4.00	304.75	226.73	40.23	14.63	6.93	86.00
8/5/2014			64.00		9.60	4.00	380.19	291.99	43.80	18.25	6.95	84.00
8/6/2014			63.00		13.00	4.00	357.03	269.91	55.70	17.14	7.17	82.00
8/7/2014		280.00	66.00		10.00	4.00	394.39	312.36	47.33	18.93	7.02	84.00
8/8/2014		200.00					406.25				7.27	84.00
8/9/2014							388.50				7.06	82.00
8/10/2014		110.00	70.00		11.00	4.00	375.75	315.63	49.60	18.04	7.07	84.00
8/11/2014		72.00	72.00		8.90	4.00	370.02	319.70	39.52	17.76	7.77	81.00
8/12/2014			76.00		4.00	4.00	382.61	348.94	18.37	16.37	7.80	76.00
8/13/2014			66.00		6.30	4.00	368.92	292.18	27.89	17.71	7.33	80.00
8/14/2014			63.00		6.30	4.00	391.95	296.31	29.63	18.81	7.42	80.00
8/15/2014		110.00					357.37				7.35	80.00
8/16/2014							316.38				7.25	80.00
8/17/2014		27.00	82.00		9.90	15.00	347.95	258.87	41.34	62.63	7.38	80.00
8/18/2014		10.00	67.00		6.20	19.00	382.53	307.55	26.46	87.22	7.59	84.00
8/19/2014			70.00		4.90	4.00	375.71	315.60	22.09	16.03	7.23	82.00
8/20/2014			70.00		4.80	10.00	314.91	264.52	18.14	37.79	7.61	82.00
8/21/2014			63.00		4.00	5.20	315.84	238.78	15.16	19.71	7.43	82.00
8/22/2014							374.64				7.54	80.00
8/23/2014							370.48				7.35	80.00
8/24/2014		74.00		9.20	81.00	318.56	282.88	35.17	309.64	7.26	82.00	



9/24/2014		70.00		4.00	21.00	435.09	365.48	20.68	109.64	7.37	77.00
9/25/2014		72.00		5.00	7.20	442.34	382.18	26.54	38.22	7.46	77.00
9/26/2014						403.01				7.33	78.00
9/27/2014						395.31				7.27	79.00
9/28/2014		62.00		4.00	4.00	424.64	315.93	20.38	20.38	7.11	78.00
9/29/2014		61.00		4.00	4.00	415.95	304.48	19.97	19.97	7.03	79.00
9/30/2014		55.00		4.00	4.00	404.31	256.84	19.41	19.41	7.35	77.00
10/1/2014		56.00		4.00	5.20	408.35	274.43	19.60	25.48	7.00	77.00
10/2/2014		56.00		4.00	4.40	398.23	267.61	19.12	21.03	7.75	79.00
10/3/2014						405.52				7.85	79.00
10/4/2014						413.22				7.50	75.00
10/5/2014	640.00	72.00		7.70	15.00	417.35	380.60	38.56	75.12	7.01	75.00
10/6/2014		76.00		14.00	29.00	404.22	388.65	67.91	140.67	7.17	75.00
10/7/2014		86.00		11.00	30.00	402.56	415.44	53.14	144.92	7.19	81.00
10/8/2014		92.00		8.60	25.00	358.53	395.62	37.00	107.56	7.35	77.00
10/9/2014		94.00		6.40	16.00	406.82	458.89	31.24	78.11	7.45	77.00
10/10/2014	1.20	640.00				395.81				7.42	78.00
10/11/2014						326.58				7.06	77.00
10/12/2014		80.00		4.80	4.00	337.80	324.29	19.46	16.21	7.29	77.00
10/13/2014		79.00		4.30	6.40	340.61	322.90	17.56	26.16	7.00	78.00
10/14/2014		74.00		4.40	4.80	383.00	340.10	20.22	22.06	7.25	78.00
10/15/2014		71.00		4.00	5.60	395.00	337.39	19.01	26.61	7.49	74.00
10/16/2014		72.00		4.00	4.00	409.67	353.95	19.66	19.66	7.54	78.00
10/17/2014						401.87				7.27	78.00
10/18/2014						382.30				7.63	79.00
10/19/2014		94.00		4.00	4.00	406.15	458.14	19.50	19.50	7.59	79.00
10/20/2014		61.00		6.00	4.00	406.97	395.57	19.53	19.53	7.71	80.00
10/21/2014		73.00		4.00	4.00	406.18	355.81	19.50	19.50	7.93	72.00
10/22/2014		64.00		4.40	4.00	420.52	322.96	22.20	20.18	7.45	73.00
10/23/2014		67.00		4.00	4.00	522.56	420.14	25.08	25.08	7.42	75.00

10/24/2014					438.74				7.30	75.00	
10/25/2014									7.17	75.00	
10/26/2014		54.00		4.00	4.00	448.70	290.76	21.54	21.54	7.20	79.00
10/27/2014		54.00		4.00	7.60	388.87	250.69	18.57	35.28	7.15	84.00
10/28/2014		49.00		4.00	4.00	372.26	218.89	17.87	17.87	7.26	82.00
10/29/2014		43.00		4.00	4.00	392.23	202.39	18.83	18.83	7.72	78.00
10/30/2014		43.00		4.00	7.60	405.84	209.41	19.48	37.01	7.39	77.00
10/31/2014						490.55				7.35	78.00
11/1/2014						418.56				7.35	74.00
11/2/2014		60.00		4.00	4.00	374.33	269.52	17.97	17.97	7.36	78.00
11/3/2014		56.00		4.00	4.00	455.88	306.35	21.86	21.88	6.10	70.00
11/4/2014											
11/5/2014											
11/6/2014		62.00		4.00	8.00	316.39	235.39	15.19	30.37	7.32	70.00
11/7/2014						365.88				7.05	70.00
11/8/2014						421.19				7.17	70.00
11/9/2014		41.00		4.00	4.00	416.43	204.88	19.99	19.99	7.12	70.00
11/10/2014		43.00		4.00	7.60	404.19	208.56	19.40	36.66	7.31	77.00
11/11/2014		45.00		4.00	7.20	404.83	218.61	19.43	34.98	7.58	75.00
11/12/2014		41.00		4.00	6.00	396.93	195.29	19.05	38.11	7.78	72.00
11/13/2014		42.00		4.00	18.00	387.71	195.41	18.61	83.75	7.75	73.00
11/14/2014						381.25				7.84	74.00
11/15/2014						371.32				7.38	68.00
11/16/2014		52.00		13.00	26.00	357.89	223.32	55.83	111.66	7.24	68.00
11/17/2014	1.00	10.00	53.00	5.10	7.60	365.49	232.45	26.75	33.33	7.24	68.00
11/18/2014		47.00		4.00	4.00	374.18	211.04	17.96	17.96	7.25	68.00
11/19/2014		46.00		4.00	4.80	361.03	207.95	17.33	20.80	7.33	77.00
11/20/2014		45.00		4.00	7.20	362.95	195.99	17.42	31.36	7.22	68.00
11/21/2014						383.88				7.27	77.00
11/22/2014						416.93				7.33	81.00

11/23/2014				64.00	-4.00	10.00	398.88	306.42	19.15	47.88	7.57	79.00
11/24/2014				66.00	-4.00	11.00	446.17	353.37	21.42	58.89	7.53	76.00
11/25/2014				66.00	-4.00	12.00	505.17	400.09	24.25	72.74	7.94	70.00
11/26/2014				61.00	-4.00	11.00	448.05	327.97	21.51	59.14	7.30	70.00
11/27/2014				59.00	5.90	8.40	438.43	310.41	31.04	44.19	7.32	70.00
11/28/2014							439.76				7.55	73.00
11/29/2014							436.00				7.03	73.00
11/30/2014				38.00	4.00	4.00	445.30	203.06	21.37	21.37	7.14	77.00
12/1/2014				39.00	4.00	4.00	457.39	214.06	21.95	21.95	7.82	73.00
12/2/2014				42.00	4.00	4.00	460.10	226.85	21.60	21.60	7.74	77.00
12/3/2014				54.00	4.00	4.40	446.77	289.51	21.44	23.59	7.97	77.00
12/4/2014				57.00	4.00	6.40	455.35	311.46	21.66	34.97	7.29	76.00
12/5/2014							460.98				7.20	74.00
12/6/2014							452.33				7.59	73.00
12/7/2014				84.00	6.50	17.00	469.20	472.95	36.60	95.72	7.50	77.00
12/8/2014	1.00	1.00	10.00	76.00	4.00	27.00	459.81	386.24	22.07	146.98	7.36	79.00
12/9/2014				65.00	5.60	49.00	446.12	347.97	29.98	262.32	7.45	79.00
12/10/2014				58.00	6.10	25.00	424.01	295.11	31.04	127.20	7.24	79.00
12/11/2014				58.00	11.00	52.00	427.31	297.41	56.40	266.64	7.33	79.00
12/12/2014							465.00				7.35	79.00
12/13/2014							407.62				7.88	75.00
12/14/2014				56.00	14.00	77.00	371.31	249.52	62.38	343.09	7.69	75.00
12/15/2014				46.00	13.00	43.00	399.02	220.26	62.25	206.89	7.81	77.00
12/16/2014				42.00	9.90	32.00	432.77	218.12	51.41	166.18	7.45	77.00
12/17/2014				37.00	16.00	22.00	445.55	197.82	85.55	117.63	7.34	72.00
12/18/2014				33.00	26.00	28.00	445.19	176.30	138.90	149.58	7.32	75.00
12/19/2014							429.91				7.56	68.00
12/20/2014							428.79				7.16	75.00
12/21/2014				32.00	84.00	7.20	424.04	162.83	427.43	36.64	7.32	77.00
12/22/2014				33.00	130.00	6.40	420.35	166.46	655.75	32.28	7.13	76.00

12/23/2014	30.00	130.00	7.20	422.41	152.07	658.96	36.50	7.08	74.00
12/24/2014	27.00	78.00	55.00	403.81	130.83	377.97	266.51	7.09	78.00
12/25/2014	20.00	16.00	11.00	386.69	95.69	76.55	52.63	7.51	72.00
12/26/2014				401.32				6.96	72.00
12/27/2014				392.86				7.17	75.00
12/28/2014	7.10	53.00	9.60	420.02	35.79	267.13	48.39	6.42	76.00
12/29/2014	2.30	25.00	22.00	421.26	11.63	126.38	111.21	6.92	72.00
12/30/2014	1.20	23.00	18.00	382.36	5.51	105.53	82.59	6.69	72.00
12/31/2014	1.00	21.00	15.00	397.93	4.78	100.28	71.63	6.71	67.00

<b>Avg</b>	1.733	1.683	5.000	5.000	1,614.583	64.798	0.010	0.324	7.540	9.644	433.070	336.537	38.346	48.533	7.238	76.865	0.200
<b>Min</b>	1.000	1.000	5.000	5.000	10.000	1.000	0.010	0.173	4.000	4.000	47.600	4.775	2.285	2.285	6.170	66.000	0.200
<b>Max</b>	5.000	5.000	5.000	5.000	*****	110.000	0.010	0.404	130.000	81.000	858.900	757.756	658.960	354.755	8.100	88.000	0.200
<b>Sum</b>																	
<b>30-Day AVG/</b>	<i>48/</i>	<i>21/</i>							<i>28/</i>	<i>25/</i>	<i>636.81</i>		<i>183.5/</i>	<i>229.3/</i>	<i>6/</i>		
<b>Daily MAX</b>	<i>89</i>	<i>46</i>			<i>400</i>	<i>355</i>			<i>48</i>	<i>50</i>	<i>1848.6</i>		<i>477</i>	<i>596.3</i>	<i>9</i>		

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2015

End Date: 12/31/2015

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (1/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (parts/MML)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Plant Effluent Flow (gpm)	Ammonia Load (lb/day)	Total Nitrogen (lb/day)	tBOD Load (lb/day)	TSS Load (lb/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2015						1.00				19.00	15.00	416.61	5.00		94.99	74.99	6.51	68.00				
1/2/2015												443.15					6.58	77.00				
1/3/2015												427.26					6.45	79.00				
1/4/2015						13.00				22.00	4.40	446.83	69.71		117.96	23.59	6.60	82.00				
1/5/2015						19.00				24.00	14.00	438.09	99.88		126.17	73.60	7.35	82.00				
1/6/2015						24.00				23.00	7.20	424.19	122.17		117.08	36.65	7.52	72.00				
1/7/2015						30.00				20.00	7.60	404.09	145.47		96.98	36.85	7.21	73.00				
1/8/2015						30.00				20.00	16.00	343.80	123.77		82.51	61.88	7.55	70.00				
1/9/2015												341.82					7.60	76.00				
1/10/2015												354.32					7.11	74.00				
1/11/2015						29.00				22.00	4.00	376.81	131.13		99.48	18.09	7.44	74.00				
1/12/2015	96.00				10.00	27.00				16.00	14.00	373.37	120.97		71.69	62.73	6.94	78.00				
1/13/2015						35.00				19.00	10.00	375.06	157.53		85.52	45.01	7.19	75.00				
1/14/2015						47.00				17.00	4.00	380.64	214.68		77.65	18.27	7.76	75.00				
1/15/2015						54.00				17.00	11.00	373.53	242.05		76.20	49.31	7.47	77.00				
1/16/2015												383.59					7.99	73.00				
1/17/2015												413.11					7.18	73.00				
1/18/2015						48.00				4.00	12.00	456.45	264.07		22.01	66.02	7.21	70.00				
1/19/2015						50.00				10.00	6.80	444.17	266.50		53.30	36.24	7.13	75.00				
1/20/2015						44.00				12.00	4.40	445.77	235.37		64.19	23.54	7.57	73.00				
1/21/2015						39.00				7.40	6.40	452.38	211.71		40.17	34.74	7.04	72.00				
1/22/2015	4.60					37.00				7.20	4.00	454.73	201.90		39.29	21.83						
1/23/2015	3.40											424.32					7.25	77.00				
1/24/2015												412.19					7.03	73.00				
1/25/2015						35.00				5.80	28.00	405.92	170.49		28.25	136.39	6.73	75.00				
1/26/2015						37.00				7.00	4.00	427.61	189.95		35.94	20.53	6.70	78.00				

1/27/2015		35.00		14.00	5.60	424.03	176.09	71.24	28.49	6.69	74.00
1/28/2015		27.00		12.00	4.00	429.55	139.17	61.66	20.62	6.67	76.00
1/29/2015		26.00		14.00	7.20	451.02	140.72	75.77	38.97	6.79	76.00
1/30/2015						482.51				6.96	77.00
1/31/2015						432.31				7.57	79.00
2/1/2015		21.00		13.00	8.40	451.85	113.87	70.49	45.55	7.44	77.00
2/2/2015		24.00		16.00	20.00	465.57	134.08	89.39	111.74	7.05	66.00
2/3/2015		25.00		19.00	10.00	467.79	140.34	106.66	56.13	7.06	68.00
2/4/2015		33.00		14.00	7.60	463.89	183.70	77.93	42.31	6.80	70.00
2/5/2015		35.00		19.00	15.00	464.22	194.97	105.84	83.56	6.90	70.00
2/6/2015						471.52				7.00	75.00
2/7/2015						468.46				6.61	75.00
2/8/2015		37.00		10.00	26.00	431.69	191.67	51.80	134.69	6.91	75.00
2/9/2015	13.00	10.00	34.00	8.40	21.00	419.60	171.20	42.30	105.74	7.06	73.00
2/10/2015			34.00	9.90	12.00	401.46	163.80	47.69	57.81	7.58	76.00
2/11/2015			46.00	13.00	12.00	408.63	225.56	63.75	58.64	7.53	73.00
2/12/2015			54.00	19.00	16.00	453.07	293.59	103.30	86.99	7.64	76.00
2/13/2015						445.61				7.85	76.00
2/14/2015						449.66				7.27	76.00
2/15/2015		56.00		9.60	4.00	447.33	300.61	51.53	21.47	7.29	76.00
2/16/2015		40.00		14.00	5.60	422.22	202.67	70.93	26.37	7.08	77.00
2/17/2015		33.00		23.00	11.00	419.54	166.14	115.79	55.38	6.95	79.00
2/18/2015		34.00		26.00	32.00	409.46	167.06	127.75	157.23	7.49	75.00
2/19/2015		30.00		31.00	4.00	401.26	144.45	149.27	19.26	7.53	72.00
2/20/2015						418.77				7.57	70.00
2/21/2015						438.65				6.91	72.00
2/22/2015		21.00		12.00	4.00	443.35	111.72	63.64	21.28	7.19	72.00
2/23/2015		17.00		38.00	4.00	444.33	90.64	202.61	21.33	7.62	73.00
2/24/2015		20.00		48.00	4.00	441.86	106.05	254.51	21.21	7.46	75.00
2/25/2015		22.00		27.00	4.00	427.29	112.80	138.44	20.51	7.34	77.00

2/26/2015					22.00			22.00	4.00	424.89	112.17	112.17	20.39	7.30	73.00
2/27/2015										419.57				7.27	79.00
2/28/2015										416.76				6.90	77.00
3/1/2015					28.00			15.00	13.00	413.28	138.86	74.39	64.47	7.00	70.00
3/2/2015	2.90	7.50	10.00	6.90	10.00	41.00	0.031	30.00	11.00	403.60	198.57	145.30	53.28	7.21	78.00
3/3/2015					29.00			20.00	10.00	385.06	127.04	87.61	43.61	7.51	78.00
3/4/2015					41.00			22.00	30.00	407.61	200.54	107.61	146.74	7.73	76.00
3/5/2015					32.00			9.20	11.00	418.52	160.71	46.20	55.24	6.90	76.00
3/6/2015										415.23				6.94	75.00
3/7/2015										409.47				7.80	75.00
3/8/2015					39.00			5.40	6.80	402.19	188.22	26.06	32.82	7.77	81.00
3/9/2015					37.00			6.20	10.00	388.29	172.40	28.89	46.59	7.70	80.00
3/10/2015					7.20			23.00	8.80	274.33	23.70	75.72	26.97	7.59	74.00
3/11/2015					51.00			16.00	11.00	274.45	167.96	52.69	36.23	7.25	74.00
3/12/2015					58.00			25.00	6.00	374.62	260.74	112.35	26.97	7.12	72.00
3/13/2015										377.15				7.65	77.00
3/14/2015										372.85				7.25	77.00
3/15/2015					51.00			11.00	6.00	375.09	229.56	49.51	27.01	7.00	75.00
3/16/2015					56.00			7.00	6.00	365.99	245.95	30.74	26.35	7.73	75.00
3/17/2015					57.00			7.50	4.40	376.17	257.30	33.86	19.86	7.83	75.00
3/18/2015					54.00			4.10	4.00	381.00	246.89	18.75	18.29	7.82	75.00
3/19/2015					52.00	0.005		5.90	4.00	367.63	229.40	26.03	17.65	7.83	77.00
3/20/2015						0.005				355.25				7.93	76.00
3/21/2015										353.74				7.47	77.00
3/22/2015					54.00			4.00	4.00	346.03	224.23	16.61	16.61	7.41	78.00
3/23/2015					61.00			4.00	4.00	345.23	252.71	16.57	16.57	7.52	75.00
3/24/2015					57.00			6.20	4.00	331.46	226.72	24.66	15.91	7.42	79.00
3/25/2015					53.00			14.00	4.00	324.70	206.51	54.55	15.59	7.80	77.00
3/26/2015					50.00			7.30	4.00	279.22	167.53	24.46	13.40	7.83	75.00
3/27/2015										359.04				7.81	73.00

3/28/2015					379.31				7.03	70.00	
3/29/2015		76.00		8.50	4.00	369.05	336.57	37.64	17.71	7.02	72.00
3/30/2015		58.00		5.90	5.20	374.94	280.96	26.55	23.40	7.30	75.00
3/31/2015		48.00		8.00	9.20	358.23	206.34	34.39	39.55	6.90	75.00
4/1/2015		52.00		10.00	6.80	361.80	225.76	43.42	29.52	7.28	80.00
4/2/2015		52.00		11.00	5.20	408.03	254.61	53.86	25.46	7.27	81.00
4/3/2015						405.38				7.13	81.00
4/4/2015						378.45				7.02	77.00
4/5/2015	1.30	63.00		7.90	4.00	352.09	266.18	33.38	16.90	7.01	79.00
4/6/2015		140.00	72.00	11.00	67.00	344.85	297.95	45.52	277.26	7.03	78.00
4/7/2015		91.00		15.00	110.00	368.10	401.97	66.26	485.89	7.12	74.00
4/8/2015		89.00		9.20	7.60	370.57	395.77	40.91	33.80	7.01	76.00
4/9/2015		85.00		10.00	4.80	401.49	409.52	48.18	23.13	7.05	76.00
4/10/2015						442.82				6.91	77.00
4/11/2015						412.16				6.94	79.00
4/12/2015		85.00		10.00	8.40	423.79	432.27	50.85	42.72	8.00	79.00
4/13/2015		75.00		19.00	5.60	404.91	364.42	32.32	27.21	7.69	79.00
4/14/2015		76.00		18.00	8.00	402.16	366.77	86.87	38.61	7.85	77.00
4/15/2015		69.00		46.00	5.60	396.59	330.03	220.02	26.79	7.10	77.00
4/16/2015		66.00		22.00	6.00	397.46	314.79	104.93	28.62	7.12	75.00
4/17/2015						396.76				7.16	79.00
4/18/2015						399.25				6.93	77.00
4/19/2015		53.00		8.90	11.00	426.45	271.22	45.54	56.29	6.89	75.00
4/20/2015		57.00		9.80	27.00	424.76	290.54	49.95	137.62	7.52	73.00
4/21/2015		39.00		25.00	6.80	423.40	198.15	127.02	34.55	7.45	73.00
4/22/2015		40.00		14.00	5.60	427.57	205.23	71.83	28.73	7.57	78.00
4/23/2015		45.00		20.00	4.00	422.50	228.15	101.40	20.28	7.68	73.00
4/24/2015						393.05				7.81	74.00
4/25/2015						402.20				7.10	74.00
4/26/2015		39.00		120.00	40.00	407.14	190.54	586.28	195.43	7.19	74.00

4/27/2015		41.00		130.00	20.00	380.77	187.34	594.00	91.38	7.21	77.00		
4/28/2015		46.00		99.00	10.00	370.92	204.75	440.65	44.51	7.27	77.00		
4/29/2015		40.00		64.00	9.60	377.59	181.24	289.99	43.50	7.79	77.00		
4/30/2015		35.00		73.00	7.20	374.45	157.27	328.02	32.35	7.70	79.00		
5/1/2015						396.08				6.95	77.00		
5/2/2015						466.69				6.94	70.00		
5/3/2015		24.00		52.00	14.00	456.82	131.56	285.06	76.75	7.01	72.00		
5/4/2015		28.00		27.00	4.80	425.30	142.90	137.80	24.50	6.91	79.00		
5/5/2015		29.00		33.00	10.00	426.83	148.54	169.02	51.22	7.02	77.00		
5/6/2015		28.00		45.00	11.00	429.24	144.22	231.79	56.66	7.17	78.00		
5/7/2015		30.00		41.00	11.00	415.17	149.46	204.26	54.80	6.98	79.00		
5/8/2015						408.36				7.08	80.00		
5/9/2015						379.97				6.96	80.00		
5/10/2015		29.00		19.00	7.20	376.50	131.02	85.84	32.53	6.83	77.00		
5/11/2015	39.00		10.00	30.00		31.00	9.20	355.68	128.04	132.31	39.27	6.93	76.00
5/12/2015				35.00		37.00	10.00	385.63	161.96	171.22	46.28	6.96	76.00
5/13/2015				40.00		65.00	7.60	377.40	181.15	294.37	34.42	6.95	76.00
5/14/2015				47.00		95.00	12.00	346.13	195.22	394.59	49.84	6.78	74.00
5/15/2015								368.90				7.08	81.00
5/16/2015								388.23				6.97	81.00
5/17/2015		54.00		64.00	5.60	382.20	247.67	293.53	25.68	7.09	79.00		
5/18/2015		55.00		66.00	4.00	384.81	253.97	304.77	18.47	7.98	75.00		
5/19/2015		53.00		100.00	11.00	396.39	252.10	475.67	52.32	7.49	77.00		
5/20/2015		50.00		62.00	4.80	351.84	211.10	261.77	20.27	7.30	72.00		
5/21/2015		50.00		110.00	7.20	235.35	141.21	310.66	20.33	7.38	68.00		
5/22/2015						324.47				7.44	77.00		
5/23/2015						351.45				7.24	79.00		
5/24/2015		48.00		51.00	8.00	338.01	194.69	206.86	32.45	7.24	81.00		
5/25/2015		44.00		53.00	13.00	329.93	174.20	209.84	51.47	7.19	74.00		
5/26/2015		40.00		36.00	16.00	376.69	180.81	162.73	72.32	8.06	81.00		

5/27/2015			38.00			20.00	12.00	386.67	176.32	92.80	55.68	7.10	77.00
5/28/2015			39.00			19.00	13.00	369.94	173.13	84.35	57.71	7.04	74.00
5/29/2015								341.77				6.99	79.00
5/30/2015								274.22				7.47	80.00
5/31/2015			39.00			15.00	4.40	288.88	135.20	52.00	15.25	7.44	78.00
6/1/2015			39.00			26.00	6.80	308.21	144.24	96.16	25.15	7.42	79.00
6/2/2015			46.00			17.00	12.00	313.76	173.20	64.01	45.18	7.37	77.00
6/3/2015			57.00			25.00	7.20	300.93	205.84	90.28	26.00	8.16	77.00
6/4/2015			64.00			37.00	5.60	298.33	229.12	132.48	20.05	8.18	79.00
6/5/2015								287.18				7.37	74.00
6/6/2015								287.92				7.24	77.00
6/7/2015			65.00			29.00	7.80	322.59	251.62	112.26	29.42	7.25	81.00
6/8/2015	3.90	17.00	510.00	59.00		30.00	9.60	355.53	251.72	127.99	40.96	7.29	81.00
6/9/2015				59.00		33.00	4.00	347.90	246.31	137.77	16.70	7.19	81.00
6/10/2015				68.00		30.00	8.80	314.82	256.89	113.34	33.24	7.43	81.00
6/11/2015				71.00		28.00	13.00	373.90	318.56	125.63	58.33	7.56	77.00
6/12/2015			360.00					375.41				7.58	82.00
6/13/2015								538.97				7.32	81.00
6/14/2015			65.00			10.00	4.00	381.49	297.56	45.78	18.31	7.45	77.00
6/15/2015			70.00			4.80	8.40	384.77	323.21	22.16	38.78	7.47	80.00
6/16/2015			70.00			4.00	5.60	391.61	328.95	18.80	26.32	7.45	80.00
6/17/2015			69.00			4.00	4.00	402.35	333.15	19.31	19.31	7.20	7.20
6/18/2015			65.00			12.00	38.00	391.33	305.24	56.35	178.45	7.16	80.00
6/19/2015								361.31				7.21	82.00
6/20/2015								357.02				7.21	81.00
6/21/2015			52.00			4.40	4.40	356.13	222.23	18.80	18.80	7.20	81.00
6/22/2015			52.00			5.70	6.00	338.41	211.79	23.22	24.44	7.13	78.00
6/23/2015			48.00			12.00	4.00	371.85	214.24	53.56	17.85	7.24	79.00
6/24/2015			52.00			12.00	4.80	372.21	232.26	53.60	21.44	7.28	79.00
6/25/2015			52.00			7.80	4.00	370.75	231.35	34.70	17.80	7.28	81.00

6/26/2015					364.23				7.50	82.00	
6/27/2015					366.82				7.58	79.00	
6/28/2015		57.00		6.80	4.00	365.68	250.13	29.84	17.55	7.50	81.00
6/29/2015		62.00		8.50	4.00	364.71	271.34	37.20	17.51	7.97	88.00
6/30/2015		69.00		6.90	4.00	361.68	299.47	29.95	17.36	7.89	80.00
7/1/2015		65.00		8.50	4.00	355.73	277.47	36.28	17.08	7.38	82.00
7/2/2015		69.00		4.00	4.00	354.39	293.43	17.01	17.01	7.27	81.00
7/3/2015						335.06				7.24	82.00
7/4/2015						329.96				7.34	81.00
7/5/2015		81.00		4.00	6.00	332.30	323.00	15.95	23.93	7.74	83.00
7/6/2015	1.00	45.00	76.00	4.90	6.80	327.40	298.59	19.25	26.72	7.59	81.00
7/7/2015			74.00	14.00	4.00	345.08	306.43	57.97	16.56	7.71	82.00
7/8/2015			71.00	14.00	4.00	347.95	296.45	58.46	16.70	7.17	82.00
7/9/2015			75.00	4.00	5.60	342.88	308.59	16.46	23.04	7.20	81.00
7/10/2015						337.66				7.30	79.00
7/11/2015						346.75				7.28	82.00
7/12/2015			96.00	4.00	6.00	349.24	402.32	16.76	25.15	7.37	77.00
7/13/2015			110.00	4.00	8.80	354.47	467.90	17.01	37.43	7.39	84.00
7/14/2015			120.00	7.10	8.00	376.85	542.66	32.11	36.18	7.45	86.00
7/15/2015			120.00	4.00	8.40	363.14	522.92	17.43	36.60	7.76	84.00
7/16/2015			120.00	4.70	16.00	352.22	507.20	19.87	67.63	7.74	86.00
7/17/2015						351.37				7.78	86.00
7/18/2015						349.00				7.55	88.00
7/19/2015			130.00	6.80	24.00	338.86	528.62	27.65	97.59	7.50	90.00
7/20/2015			120.00	4.00	14.00	337.05	485.35	16.18	56.62	7.53	84.00
7/21/2015			120.00	4.00	19.00	347.92	501.00	16.70	79.33	7.66	90.00
7/22/2015			120.00	4.00	14.00	347.18	499.94	16.66	58.33	7.56	86.00
7/23/2015			110.00	5.30	16.00	341.53	450.82	21.72	65.57	7.59	80.00
7/24/2015						339.23				7.56	91.00
7/25/2015						332.30				7.39	90.00

7/26/2015		97.00		4.00	6.80	334.23	389.04	16.04	27.27	7.36	90.00
7/27/2015		95.00		8.70	4.40	341.66	389.49	35.67	18.04	7.39	79.00
7/28/2015		95.00		5.70	8.00	380.01	433.21	25.99	36.48	7.64	86.00
7/29/2015		92.00		4.00	4.80	395.00	436.08	18.96	22.75	7.63	82.00
7/30/2015		90.00		4.00	5.60	398.54	430.42	19.13	26.78	7.57	86.00
7/31/2015						376.39				7.54	86.00
8/1/2015						375.93					90.00
8/2/2015		94.00		4.30	4.40	380.74	429.47	19.65	20.10		90.00
8/3/2015	1.00	270.00	93.00	4.00	9.60	376.92	420.64	18.09	43.42	8.03	81.00
8/4/2015			98.00	4.00	16.00	357.70	420.66	17.17	68.68	7.61	88.00
8/5/2015			97.00	4.00	5.20	360.55	419.68	17.31	22.50	7.53	90.00
8/6/2015			99.00	4.00	6.40	364.68	433.24	17.50	28.01	7.42	84.00
8/7/2015						350.81				7.38	86.00
8/8/2015						366.22				7.42	86.00
8/9/2015		110.00		4.30	18.00	364.30	480.88	18.80	78.69	7.52	86.00
8/10/2015		110.00		5.00	5.60	362.95	479.09	21.78	24.39		82.00
8/11/2015		110.00		5.80	12.00	363.04	479.21	25.27	52.28	8.07	82.00
8/12/2015		110.00		5.60	6.00	362.17	478.06	24.34	26.08	8.02	81.00
8/13/2015		110.00		11.00	5.60	341.17	450.34	45.03	22.93	8.03	84.00
8/14/2015						381.76				8.06	84.00
8/15/2015						332.57				7.54	86.00
8/16/2015		100.00		4.00	6.40	313.57	376.28	15.05	24.08	7.50	84.00
8/17/2015		110.00		4.00	4.00	312.02	411.87	14.98	14.98	7.50	86.00
8/18/2015		110.00		4.00	4.00	324.23	427.98	15.56	15.56	7.50	84.00
8/19/2015		100.00		4.00	7.20	329.79	395.75	15.63	28.49	7.90	82.00
8/20/2015		100.00		4.00	4.80	323.99	388.79	15.55	18.66	7.70	81.00
8/21/2015						310.71				7.68	77.00
8/22/2015						291.18				7.34	81.00
8/23/2015		91.00		4.00	4.00	283.62	309.93	13.62	13.62	7.28	80.00
8/24/2015		76.00		6.00	4.00	284.62	259.57	20.49	13.66	7.20	78.00

8/25/2015				69.00		15.00	4.40	284.76	235.78	51.26	15.04	7.20	78.00
8/26/2015				65.00		4.70	4.00	294.94	230.05	16.63	14.16	7.09	78.00
8/27/2015				64.00		4.00	4.80	311.59	239.30	14.96	17.95	7.12	75.00
8/28/2015								326.48				7.28	81.00
8/29/2015								316.74				7.26	82.00
8/30/2015				76.00		4.00	4.00	298.13	271.89	14.31	14.31	7.19	81.00
8/31/2015				83.00		6.60	5.60	297.50	296.31	23.56	19.99	7.16	79.00
9/1/2015				88.00		5.20	4.40	295.92	312.49	18.47	15.62	7.24	80.00
9/2/2015				94.00		4.00	4.00	357.91	403.72	17.18	17.18	7.40	80.00
9/3/2015				97.00		4.00	4.00	335.02	389.96	16.08	16.08	7.48	84.00
9/4/2015	1.10	5.50		10.00				334.95				7.54	84.00
9/5/2015								331.20				7.27	88.00
9/6/2015				97.00		4.00	4.00	332.17	386.65	15.94	15.94	7.28	86.00
9/7/2015				91.00		4.00	4.00	332.68	363.29	15.97	15.97	7.96	80.00
9/8/2015				88.00		4.00	4.00	336.71	355.57	16.16	16.16	7.97	84.00
9/9/2015				81.00		4.00	4.00	334.90	325.52	16.08	16.08	7.29	86.00
9/10/2015				79.00		4.00	4.00	336.62	319.31	16.17	16.17	7.27	83.00
9/11/2015								365.65				7.11	84.00
9/12/2015								399.99				7.29	78.00
9/13/2015				42.00		13.00	4.00	391.32	197.23	61.05	18.78	7.37	76.00
9/14/2015				39.00		4.00	4.00	317.84	148.75	15.26	15.26	7.40	77.00
9/15/2015				36.00		4.00	4.00	300.28	129.72	14.41	14.41	7.44	77.00
9/16/2015				34.00		7.70	4.00	312.32	127.43	28.86	14.99	7.33	77.00
9/17/2015				33.00		9.90	4.00	294.31	116.55	34.96	14.13	7.44	77.00
9/18/2015								293.17				7.89	75.00
9/19/2015								331.54				7.42	77.00
9/20/2015				41.00		4.00	4.00	339.62	167.09	16.30	16.30	7.26	77.00
9/21/2015				50.00		4.00	4.00	339.15	203.49	16.28	16.28	7.31	77.00
9/22/2015				62.00		4.00	4.00	332.07	247.06	15.94	15.94	7.32	79.00
9/23/2015				72.00		4.00	4.00	324.44	280.32	15.57	15.57	7.95	79.00

9/24/2015		76.00		4.10	5.60	347.65	317.06	17.10	23.36	7.90	80.00
9/25/2015						346.84				7.62	80.00
9/26/2015						342.17				7.41	78.00
9/27/2015		87.00		4.40	4.00	337.58	352.43	17.82	16.20	7.22	82.00
9/28/2015		85.00		5.90	4.00	331.91	338.55	23.50	15.93	7.49	80.00
9/29/2015		90.00	0.010	4.00	4.00	302.73	326.95	14.53	14.53	7.36	78.00
9/30/2015		82.00		7.70	4.00	295.53	290.80	27.31	14.19	7.26	75.00
10/1/2015		84.00		4.10	4.40	299.55	301.95	14.74	15.82	7.41	74.00
10/2/2015						301.39				7.39	79.00
10/3/2015						305.42				7.27	77.00
10/4/2015		82.00		4.00	4.00	288.89	284.27	13.87	13.87	7.34	79.00
10/5/2015		95.00		4.00	5.20	315.33	363.26	15.14	19.68	7.44	74.00
10/6/2015		100.00		4.40	5.20	306.74	368.09	16.20	19.14	7.44	73.00
10/7/2015		110.00		4.90	4.00	317.53	419.14	18.67	15.24	7.63	75.00
10/8/2015		100.00		4.00	6.80	322.49	386.99	15.48	26.32	7.75	74.00
10/9/2015	1.00		1,100.00			318.27				7.75	81.00
10/10/2015						318.25				7.35	79.00
10/11/2015		100.00		4.00	9.80	320.50	384.80	15.38	37.69	7.31	81.00
10/12/2015		91.00		4.00	15.00	349.98	382.18	15.80	63.00	7.38	79.00
10/13/2015		80.00		8.80	16.00	336.57	323.11	35.54	64.62	7.53	79.00
10/14/2015		76.00		6.90	18.00	345.71	315.29	28.62	74.67	7.44	79.00
10/15/2015		79.00		9.70	18.00	356.49	337.95	41.50	77.00	7.56	77.00
10/16/2015		91.00				374.47				7.21	73.00
10/17/2015						357.86				7.34	78.00
10/18/2015											
10/19/2015											
10/20/2015						378.31					
10/21/2015						356.54					
10/22/2015		68.00		25.00	30.00	388.91	317.35	116.67	140.01	7.30	75.00
10/23/2015						322.64				7.95	72.00

10/24/2015					320.97			7.29	72.00		
10/25/2015		57.00		4.60	14.00	363.12	248.37	20.04	61.00	7.27	72.00
10/26/2015		51.00		4.30	9.80	364.58	266.87	18.81	42.00	7.43	73.00
10/27/2015		68.00		4.00	6.80	340.21	277.61	16.33	27.76	7.43	73.00
10/28/2015		69.00		4.00	14.00	333.45	276.10	16.01	56.02	7.61	78.00
10/29/2015		70.00		6.40	19.00	339.66	285.31	26.09	77.44	7.52	70.00
10/30/2015						351.24				7.44	68.00
10/31/2015						343.44				7.25	70.00
11/1/2015		69.00		6.10	23.00	348.88	288.87	25.54	96.29	7.26	71.00
11/2/2015		71.00		6.30	22.00	348.27	296.73	26.33	91.94	7.29	73.00
11/3/2015		66.00		5.10	26.00	340.76	289.88	20.85	106.32	7.42	74.00
11/4/2015		63.00		6.30	26.00	355.05	288.42	26.84	110.78	7.22	74.00
11/5/2015		69.00		4.00	20.00	357.99	296.42	17.18	85.92	7.31	76.00
11/6/2015						369.60				7.58	77.00
11/7/2015						367.83				7.21	77.00
11/8/2015		80.00		7.10	38.00	360.06	345.66	30.68	164.19	7.21	75.00
11/9/2015	1.00	72.00		6.60	40.00	362.62	313.30	28.72	174.06	7.25	69.00
11/10/2015		78.00		8.90	48.00	361.77	338.62	36.64	208.38	7.25	70.00
11/11/2015		75.00		7.50	32.00	326.79	294.11	29.41	125.49	7.27	70.00
11/12/2015		78.00		6.80	33.00	315.46	295.29	25.74	124.93	7.29	68.00
11/13/2015		3,700.00				315.29				7.36	72.00
11/14/2015						315.93				7.61	77.00
11/15/2015		80.00		5.50	22.00	316.39	303.73	20.88	83.53	7.75	79.00
11/16/2015		78.00		5.00	26.00	306.34	286.73	18.38	95.58	7.77	79.00
11/17/2015		76.00		5.40	26.00	359.53	327.89	23.30	120.60	7.87	79.00
11/18/2015		76.00		5.20	17.00	352.74	321.70	22.01	71.96	7.34	79.00
11/19/2015		78.00		4.00	11.00	354.68	331.98	17.02	46.82	7.16	73.00
11/20/2015		10.00				348.38				7.18	70.00
11/21/2015						344.86				7.62	75.00
11/22/2015		68.00		5.80	7.20	371.63	303.25	25.67	32.11	7.39	77.00

11/23/2015			63.00		4.00	13.00	361.18	273.05	17.34	56.34	7.77	77.00
11/24/2015			61.00		4.20	8.80	346.79	253.85	17.48	28.30	7.42	77.00
11/25/2015			58.00		4.10	8.80	294.50	204.97	14.48	31.10	7.41	77.00
11/26/2015			53.00		4.50	8.40	286.80	182.40	15.49	28.91	7.96	77.00
11/27/2015							324.34				7.09	72.00
11/28/2015							348.56				7.44	70.00
11/29/2015			45.00		10.00	5.60	339.96	183.58	40.80	22.85	7.46	70.00
11/30/2015			43.00		4.00	8.00	341.33	176.13	16.38	32.77	7.39	79.00
12/1/2015			42.00		4.00	11.00	344.80	173.78	16.55	45.51	7.49	81.00
12/2/2015			43.00		4.10	8.40	346.04	178.56	17.03	34.88	7.76	79.00
12/3/2015			44.00		6.10	9.20	357.72	188.88	26.19	39.49	7.79	79.00
12/4/2015							369.33				7.58	77.00
12/5/2015							379.97				7.67	76.00
12/6/2015			67.00		4.10	8.80	380.23	305.70	18.71	40.15	7.61	77.00
12/7/2015	1.00	-1.00	99.00	73.00	4.00	10.00	380.49	333.31	18.26	45.86	7.37	70.00
12/8/2015			80.00		4.00	12.00	368.08	353.36	17.67	53.00	7.51	79.00
12/9/2015			77.00		6.40	14.00	376.20	347.61	28.89	63.20	7.65	75.00
12/10/2015			80.00		4.20	17.00	382.81	367.50	19.29	78.09	7.67	74.00
12/11/2015							391.77				7.37	74.00
12/12/2015							382.56				7.44	76.00
12/13/2015			85.00		4.00	24.00	378.51	386.08	18.17	109.01	7.40	80.00
12/14/2015			80.00		6.20	17.00	382.35	367.06	28.45	78.00	7.34	79.00
12/15/2015			70.00		4.20	10.00	382.29	321.12	19.27	45.87	7.29	72.00
12/16/2015			65.00		7.50	17.00	384.80	300.14	34.63	78.50	7.13	75.00
12/17/2015			64.00		6.60	26.00	388.55	298.41	30.77	121.23	7.40	70.00
12/18/2015							388.35				7.56	77.00
12/19/2015							380.49				7.37	77.00
12/20/2015			60.00		7.10	27.00	388.15	279.47	33.07	125.76	7.51	77.00
12/21/2015			64.00		4.30	21.00	393.99	302.58	20.33	99.29	7.53	80.00
12/22/2015			77.00		4.00	16.00	403.53	372.86	19.37	77.48	7.75	79.00

12/23/2015						78.00		4.00	13.00	401.91	376.19	19.29	62.70	7.67	82.00
12/24/2015						74.00		4.00	8.00	347.28	308.38	16.67	33.34	7.51	79.00
12/25/2015										323.39				7.43	72.00
12/26/2015										297.78				7.34	74.00
12/27/2015						61.00		4.00	4.00	293.62	214.93	14.09	14.09	7.57	70.00
12/28/2015						51.00		4.00	9.60	300.39	183.84	14.42	34.60	7.51	73.00
12/29/2015						48.00		4.00	4.40	307.74	177.26	14.77	16.25	7.73	72.00
12/30/2015						48.00		4.00	4.00	301.96	173.93	14.49	14.49	7.83	73.00
12/31/2015						43.00		4.00	4.00	303.45	156.58	14.57	14.57	7.99	73.00
<b>Avg</b>	<b>12.157</b>	<b>7.750</b>	<b>10.000</b>	<b>6.900</b>	<b>425.000</b>	<b>62.242</b>	<b>0.013</b>	<b>14.854</b>	<b>10.656</b>	<b>366.318</b>	<b>266.935</b>	<b>66.724</b>	<b>47.238</b>	<b>7.380</b>	<b>77.414</b>
<b>Min</b>	<b>1.000</b>	<b>1.000</b>	<b>10.000</b>	<b>6.900</b>	<b>10.000</b>	<b>1.000</b>	<b>0.005</b>	<b>4.000</b>	<b>4.000</b>	<b>235.350</b>	<b>4.999</b>	<b>13.623</b>	<b>13.403</b>	<b>6.450</b>	<b>7.200</b>
<b>Max</b>	<b>96.000</b>	<b>17.000</b>	<b>10.000</b>	<b>6.900</b>	<b>3,700.000</b>	<b>130.000</b>	<b>0.031</b>	<b>130.000</b>	<b>110.000</b>	<b>538.970</b>	<b>542.664</b>	<b>594.001</b>	<b>485.692</b>	<b>8.180</b>	<b>91.000</b>
<b>Sum</b>											<b>#####</b>				
<b>30-Day AVG/</b>	<b>40/</b>	<b>21/</b>						<b>20/</b>	<b>25/</b>	<b>636.81</b>		<b>183.5/</b>	<b>229.3/</b>	<b>6/</b>	
<b>Daily MAX</b>	<b>89</b>	<b>46</b>			<b>400</b>	<b>155</b>		<b>40</b>	<b>50</b>	<b>1848.6</b>		<b>477</b>	<b>596.3</b>	<b>9</b>	

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2016 - End Date: 12/31/2016

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (1/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (parts/MLN)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Flow Effluent (gpm)	Ammonia Load (lb/day)	Total Nitrogen (lb/day)	tBOD Load (lb/day)	TSS Load (lb/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2016						44.00				4.00	4.00	361.03	190.62		17.33	17.33	7.65	70.00				
1/2/2016												371.09					7.57	70.00				
1/3/2016						43.00				4.00	8.00	382.96	197.61		18.38	36.76	7.54	70.00				
1/4/2016	1.00				36.00	45.00				4.90	15.00	399.88	215.94		23.51	71.98	7.62	73.00				
1/5/2016						53.00				4.00	16.00	402.83	256.20		19.34	77.34	7.55	78.00				
1/6/2016						61.00				4.00	20.00	387.31	283.51		18.59	92.95	7.92	81.00				
1/7/2016						69.00				6.80	26.00	393.93	326.17		32.14	122.91	7.88	79.00				
1/8/2016												397.50					7.88	74.00				
1/9/2016												388.03					7.41	72.00				
1/10/2016						78.00				20.00	48.00	372.97	349.10		89.51	214.83	7.50	72.00				
1/11/2016						86.00				47.00	32.00	396.67	409.36		223.72	152.32	7.48	70.00				
1/12/2016						82.00				42.00	28.00	370.86	364.93		186.91	124.61	7.58	68.00				
1/13/2016						79.00				47.00	34.00	354.02	335.61		199.67	144.44	7.39	70.00				
1/14/2016						86.00				56.00	29.00	369.44	381.26		248.26	128.57	7.40	70.00				
1/15/2016												352.60					7.44	79.00				
1/16/2016												353.17					7.47	77.00				
1/17/2016						88.00				56.00	43.00	366.21	386.72		246.09	188.96	7.59	73.00				
1/18/2016						87.00				43.00	21.00	347.77	363.07		179.45	87.64	7.43	70.00				
1/19/2016						86.00				42.00	24.00	345.63	356.69		174.20	99.54	7.54	70.00				
1/20/2016						85.00				21.00	13.00	340.35	347.16		85.77	53.09	7.19	70.00				
1/21/2016						83.00				28.00	34.00	329.72	328.40		110.79	134.53	7.21	70.00				
1/22/2016												337.73					7.21	68.00				
1/23/2016												338.03					7.18	75.00				
1/24/2016						76.00				37.00	21.00	336.82	307.18		149.55	84.88	7.36	75.00				
1/25/2016						75.00				28.00	10.00	330.20	297.18		110.95	39.62	7.43	73.00				
1/26/2016						81.00				11.00	14.00	328.95	319.74		43.42	55.26	7.50	74.00				

1/27/2016		83.00		16.00	13.00	323.72	322.43	62.15	50.50	7.40	75.00
1/28/2016		83.00		15.00	12.00	322.11	320.82	57.98	46.38	7.46	75.00
1/29/2016						335.43				7.53	74.00
1/30/2016						334.80				7.79	74.00
1/31/2016		82.00		4.50	7.60	292.28	287.60	15.78	26.66	7.78	78.00
2/1/2016		87.00		4.00	20.00	285.64	298.21	13.71	68.55	7.79	77.00
2/2/2016		87.00		5.50	9.60	314.17	327.99	20.74	36.19	7.73	77.00
2/3/2016		90.00		9.50	14.00	314.63	339.80	35.87	52.86	7.59	77.00
2/4/2016		89.00		7.20	14.00	321.35	343.20	27.76	53.99	7.59	77.00
2/5/2016						360.66				7.57	72.00
2/6/2016						365.56				7.43	72.00
2/7/2016	1.00	2.10		7.40	14.00	357.17	385.74	31.72	60.00	7.38	77.00
2/8/2016		520.00	91.00	7.60	6.00	331.07	361.53	30.19	23.84	7.55	77.00
2/9/2016			92.00	6.90	10.00	343.84	379.60	28.47	41.26	7.19	79.00
2/10/2016			96.00	7.70	16.00	339.14	390.69	31.34	65.11	7.72	77.00
2/11/2016			93.00	5.40	5.60	321.48	358.77	20.83	21.60	7.67	79.00
2/12/2016						298.06				7.63	79.00
2/13/2016						303.20				7.63	74.00
2/14/2016			96.00	6.30	9.60	258.11	297.34	19.51	29.73	7.65	74.00
2/15/2016		54.00	88.00	4.20	6.00	267.13	282.09	13.46	19.23	7.48	73.00
2/16/2016			87.00	9.50	6.00	278.46	290.71	31.74	20.05	7.56	73.00
2/17/2016			88.00	14.00	7.60	283.12	298.97	47.56	25.82	7.48	74.00
2/18/2016			87.00	13.00	4.80	266.20	277.91	41.53	15.33	7.61	74.00
2/19/2016						283.31				7.56	77.00
2/20/2016						331.55				7.47	77.00
2/21/2016			97.00	30.00	12.00	353.76	411.78	127.35	50.94	7.59	79.00
2/22/2016			95.00	9.60	4.00	355.78	405.59	40.99	17.08	7.64	78.00
2/23/2016			86.00	4.00	4.80	358.02	369.48	17.18	20.62	7.59	79.00
2/24/2016			81.00	4.00	4.00	336.19	326.78	16.14	16.14	7.49	73.00
2/25/2016			78.00	10.00	6.40	355.79	333.02	42.69	27.32	7.49	72.00



3/27/2016		82.00		4.00	4.40	332.53	327.21	15.96	17.56	7.26	79.00
3/28/2016		77.00		4.00	8.40	320.69	296.32	15.39	32.33	7.33	73.00
3/29/2016		71.00		5.20	4.00	300.73	256.22	18.77	14.44	7.33	74.00
3/30/2016		66.00		4.00	4.00	298.19	243.32	14.31	14.31	7.54	75.00
3/31/2016		67.00		4.00	4.00	317.82	255.53	15.26	15.26	7.58	79.00
4/1/2016						321.98				7.60	80.00
4/2/2016						323.68				7.63	79.00
4/3/2016		76.00		4.00	4.00	327.46	298.64	15.72	15.72	7.55	79.00
4/4/2016		76.00		14.00	4.00	333.64	304.28	56.05	16.01	7.54	76.00
4/5/2016		74.00		5.10	4.00	331.34	294.23	20.28	15.90	7.62	76.00
4/6/2016		83.00		4.10	5.60	327.40	326.09	16.11	22.00	7.50	74.00
4/7/2016		84.00		4.00	12.00	322.29	324.87	15.47	46.41	7.33	76.00
4/8/2016						319.61				7.37	76.00
4/9/2016						322.98				7.64	73.00
4/10/2016		80.00		6.70	5.20	316.69	304.02	25.46	19.76	7.75	72.00
4/11/2016	1.00	10.00	83.00	4.00	5.60	312.48	311.23	15.00	21.00	7.65	79.00
4/12/2016		82.00		6.00	4.00	305.33	300.44	21.98	14.66	7.77	79.00
4/13/2016		82.00		4.00	4.00	303.73	298.87	14.58	14.58	7.66	79.00
4/14/2016		79.00		6.20	9.60	293.90	278.62	28.92	33.66	7.65	79.00
4/15/2016						297.61				7.62	77.00
4/16/2016						299.12				7.49	74.00
4/17/2016		90.00		4.00	11.00	295.90	317.41	14.11	38.79	7.36	76.00
4/18/2016		94.00		12.00	11.00	310.93	350.73	44.77	41.04	7.50	81.00
4/19/2016		96.00		5.60	11.00	304.64	350.95	20.47	40.21	7.37	81.00
4/20/2016		93.00		12.00	9.60	313.19	349.52	45.10	36.08	7.75	82.00
4/21/2016		92.00		7.00	7.20	318.07	351.15	26.72	27.48	7.62	81.00
4/22/2016						318.10				7.59	75.00
4/23/2016						309.37				7.36	74.00
4/24/2016		87.00		11.00	19.00	305.18	318.61	40.28	69.58	7.33	76.00
4/25/2016		89.00		8.90	34.00	302.23	322.78	32.28	123.31	7.47	81.00

4/26/2016		92.00		7.70	50.00	318.10	351.18	29.39	190.86	7.54	77.00
4/27/2016		96.00		12.00	51.00	334.22	385.02	48.13	204.54	7.34	74.00
4/28/2016		100.00		15.00	58.00	337.57	405.08	60.76	234.95	7.42	77.00
4/29/2016						327.85				7.39	75.00
4/30/2016						319.50				7.28	75.00
5/1/2016		98.00		9.70	67.00	318.19	374.19	37.04	255.82	7.35	77.00
5/2/2016		100.00		8.00	50.00	321.71	386.05	30.88	193.03	7.36	75.00
5/3/2016		95.00		7.20	42.00	331.70	378.14	28.66	167.18	7.39	76.00
5/4/2016		93.00		6.60	41.00	317.59	354.43	25.15	156.25	7.44	72.00
5/5/2016		95.00		6.50	21.00	304.70	347.36	23.77	76.78	7.37	75.00
5/6/2016						296.78				7.42	79.00
5/7/2016						311.25				7.40	81.00
5/8/2016	1.00	99.00		7.20	28.00	315.45	374.75	27.25	105.99	7.37	80.00
5/9/2016		1,200.00	100.00	6.90	16.00	322.45	386.94	26.70	61.91	7.46	75.00
5/10/2016		110.00		6.10	4.00	315.82	416.88	23.12	15.16	7.53	75.00
5/11/2016		110.00		11.00	13.00	308.49	407.21	40.72	48.12	7.28	79.00
5/12/2016		110.00		6.30	13.00	322.26	425.38	24.36	50.27	7.33	80.00
5/13/2016		1,200.00				361.47				7.25	76.00
5/14/2016						340.17				7.68	74.00
5/15/2016		97.00		4.30	14.00	327.35	381.04	16.89	54.99	7.58	7.50
5/16/2016		95.00		4.00	16.00	327.22	373.03	15.71	62.83	7.56	77.00
5/17/2016		8,000.00	100.00	8.50	15.00	330.88	396.82	33.73	59.52	7.54	77.00
5/18/2016		100.00		4.00	20.00	325.54	390.65	15.63	78.13	7.70	75.00
5/19/2016		100.00		7.90	27.00	324.99	389.99	30.81	105.30	7.49	77.00
5/20/2016		14,000.00				325.14				7.42	72.00
5/21/2016						326.12				7.42	81.00
5/22/2016		100.00		6.40	45.00	324.94	389.93	24.96	175.47	7.22	81.00
5/23/2016		110.00		7.60	60.00	335.16	442.41	30.57	241.32	7.31	84.00
5/24/2016		110.00		9.80	67.00	326.45	430.91	38.39	262.47	7.38	84.00
5/25/2016		110.00		5.50	56.00	320.89	423.57	21.18	215.64	7.56	84.00

5/26/2016				98.00		13.00	55.00	316.92	372.70	49.44	209.17	7.60	88.00
5/27/2016								321.80				7.71	86.00
5/28/2016								341.86				7.17	86.00
5/29/2016				98.00		6.20	20.00	341.73	401.87	25.42	82.02	7.49	86.00
5/30/2016				99.00		5.80	51.00	325.27	386.42	22.64	199.07	7.37	80.00
5/31/2016				100.00		7.90	6.40	319.21	383.05	30.26	24.52	7.38	80.00
6/1/2016				89.00		6.80	11.00	310.95	332.09	25.37	41.05	7.23	80.00
6/2/2016				83.00		8.00	10.00	292.32	291.15	28.06	35.08	7.28	80.00
6/3/2016								266.75				7.40	84.00
6/4/2016								277.83				7.38	86.00
6/5/2016				85.00		6.00	22.00	282.92	288.58	20.37	74.69	7.45	86.00
6/6/2016				92.00		6.50	13.00	284.67	314.28	22.20	44.41	7.43	86.00
6/7/2016				100.00		6.80	18.00	282.94	339.53	23.09	61.12	7.40	84.00
6/8/2016				94.00		9.50	17.00	284.08	320.44	32.39	57.95	7.57	80.00
6/9/2016				95.00		10.00	14.00	295.49	336.86	35.46	49.64	7.37	80.00
6/10/2016								298.14				7.43	86.00
6/11/2016								300.11				7.67	86.00
6/12/2016				96.00		6.70	11.00	302.89	348.93	24.35	39.98	7.79	86.00
6/13/2016	1.00	3.00	640.00	93.00		6.30	12.00	294.32	328.46	22.25	42.38	7.80	86.00
6/14/2016				95.00		11.00	15.00	298.82	340.65	39.44	53.79	7.58	86.00
6/15/2016				94.00		6.60	8.80	349.75	394.52	27.70	36.93	7.48	86.00
6/16/2016				92.00		7.10	9.20	344.74	380.59	29.37	38.06	7.36	86.00
6/17/2016								339.84				7.48	84.00
6/18/2016								334.16				7.61	80.00
6/19/2016				87.00		4.00	10.00	339.82	354.77	16.31	40.78	7.77	80.00
6/20/2016			60,000.00	87.00		4.00	11.00	346.54	361.79	16.63	45.74	7.81	86.00
6/21/2016				84.00		7.40	10.00	357.48	360.34	31.74	42.90	7.82	84.00
6/22/2016				80.00		17.00	8.80	359.22	344.85	73.28	37.93	7.68	84.00
6/23/2016				82.00		4.80	6.00	356.59	350.88	20.54	25.67	7.66	84.00
6/24/2016								349.51				7.57	80.00

6/25/2016				332.90				7.52	86.00
6/26/2016	73.00	4.00	4.00	331.76	290.62	15.92	15.92	7.59	86.00
6/27/2016	67.00	4.00	4.00	353.03	283.84	16.95	16.95	7.58	86.00
6/28/2016	69.00	4.00	4.00	326.34	270.21	15.66	15.66	7.70	86.00
6/29/2016	72.00	4.30	4.00	303.82	262.50	15.68	14.58	7.71	82.00
6/30/2016	76.00	4.00	4.00	311.61	284.19	14.96	14.96	7.72	86.00
7/1/2016				336.31				7.60	82.00
7/2/2016				276.30				7.46	79.00
7/3/2016	84.00	4.00	4.00	262.86	264.96	12.62	12.62	7.56	77.00
7/4/2016	85.00	4.00	4.00	266.32	271.65	12.78	12.78	7.47	84.00
7/5/2016	91.00	4.00	4.00	270.00	294.84	12.96	12.96	7.40	82.00
7/6/2016	96.00	4.00	4.00	337.93	389.30	16.22	16.22	7.56	82.00
7/7/2016	97.00	4.00	4.00	356.70	415.20	17.12	17.12	7.54	84.00
7/8/2016				360.28				7.53	84.00
7/9/2016				349.67				7.97	84.00
7/10/2016	110.00	5.30	4.00	349.15	460.88	22.21	16.76	8.10	84.00
7/11/2016	110.00	4.00	4.00	312.10	411.97	14.98	14.98	7.96	86.00
7/12/2016	110.00	4.60	5.60	305.98	403.89	16.69	20.56	7.25	86.00
7/13/2016	110.00	4.70	4.40	312.39	412.35	17.62	16.49	7.56	90.00
7/14/2016	120.00	8.80	9.20	313.39	451.28	33.09	34.60	7.51	86.00
7/15/2016				352.27				7.62	82.00
7/16/2016				339.35				7.65	86.00
7/17/2016	120.00	5.20	11.00	345.24	497.15	21.54	45.57	7.64	86.00
7/18/2016	120.00	6.80	4.00	356.65	513.58	29.10	17.12	7.70	90.00
7/19/2016	120.00	6.80	9.60	357.50	514.80	29.17	41.18	7.60	90.00
7/20/2016	120.00	11.00	10.00	343.95	495.29	45.40	41.27	8.06	90.00
7/21/2016	110.00	9.60	12.00	349.00	460.66	40.20	50.26	7.97	90.00
7/22/2016				346.64				7.97	88.00
7/23/2016				330.76				7.64	88.00
7/24/2016	87.00	8.40	12.00	326.28	340.64	32.89	46.98	7.81	91.00

7/25/2016	1.00	1.00	410.00	86.00	8.20	11.00	323.84	334.20	31.87	42.75	7.56	86.00
7/26/2016				86.00	8.10	8.00	321.84	332.14	31.28	30.90	7.66	86.00
7/27/2016				89.00	8.60	12.00	313.70	335.03	32.37	45.17	7.56	86.00
7/28/2016				94.00	10.00	8.80	306.63	345.88	36.80	32.38	7.61	88.00
7/29/2016							311.19				7.55	80.00
7/30/2016							303.99				7.63	90.00
7/31/2016				93.00	8.10	7.20	302.77	337.89	29.43	26.16	7.52	90.00
8/1/2016				92.00	17.00	6.00	305.80	337.60	62.38	22.02	7.53	89.00
8/2/2016				95.00	15.00	7.20	181.91	207.36	32.74	15.72	7.56	89.00
8/3/2016				97.00	15.00	10.00	239.93	279.28	43.19	28.79	7.65	88.00
8/4/2016				96.00	27.00	10.00	337.47	388.77	109.34	40.50	7.51	90.00
8/5/2016							332.55				7.59	90.00
8/6/2016							335.08				7.51	92.00
8/7/2016				90.00	11.00	4.00	321.75	347.49	42.47	15.44	7.35	92.00
8/8/2016				90.00	16.00	5.20	305.73	330.19	58.70	19.08	7.56	88.00
8/9/2016				96.00	22.00	8.80	330.13	380.31	87.15	34.86	7.62	86.00
8/10/2016				89.00	31.00	6.60	340.55	363.71	126.68	27.79	7.58	84.00
8/11/2016				81.00	23.00	5.20	314.17	343.07	86.71	19.60	7.26	68.00
8/12/2016							301.97				7.37	90.00
8/13/2016							293.25				7.55	88.00
8/14/2016				97.00	6.00	4.40	304.28	354.18	21.91	16.07	7.58	90.00
8/15/2016				100.00	4.00	6.00	312.87	375.20	15.01	22.51	7.57	84.00
8/16/2016				99.00	6.00	5.60	317.78	377.52	22.88	21.35	7.67	82.00
8/17/2016				98.00	5.80	4.00	317.07	365.26	22.07	15.22	7.58	84.00
8/18/2016				85.00	7.20	5.20	371.69	379.12	32.11	23.19	7.53	86.00
8/19/2016	1.00		340.00				372.91				7.51	86.00
8/20/2016							345.01				7.60	86.00
8/21/2016				83.00	4.00	5.20	225.48	224.58	10.82	14.07	7.53	84.00
8/22/2016												
8/23/2016												

8/24/2016					223.44						
8/25/2016			94.00	4.00	9.20	270.31	304.91	12.97	29.84	7.24	80.00
8/26/2016						332.19				7.23	80.00
8/27/2016						319.35				7.61	80.00
8/28/2016			66.00	4.00	4.00	299.56	237.25	14.38	14.38	7.45	80.00
8/29/2016			62.00	6.20	4.40	325.07	241.85	24.19	17.16	7.43	82.00
8/30/2016			47.00	5.50	4.00	436.23	246.03	28.79	20.94	7.54	79.00
8/31/2016			72.00	4.50	6.00	273.04	235.91	14.74	19.66	7.45	79.00
9/1/2016			75.00	5.00	4.80	251.17	226.05	15.07	14.47	7.47	81.00
9/2/2016						278.94				7.42	81.00
9/3/2016						312.03				7.64	81.00
9/4/2016			87.00	7.00	4.00	314.41	328.24	26.41	15.09	7.63	81.00
9/5/2016			86.00	5.00	4.00	277.06	285.93	16.62	13.30	7.39	84.00
9/6/2016			87.00	4.00	6.80	292.49	305.36	14.04	23.87	7.41	84.00
9/7/2016			87.00	5.00	5.20	301.50	314.77	18.09	18.81	7.75	82.00
9/8/2016			85.00	4.00	4.00	312.74	318.99	15.01	15.01	7.79	82.00
9/9/2016						301.80				7.63	88.00
9/10/2016						296.42				7.67	86.00
9/11/2016			80.00	4.00	4.00	294.85	283.06	14.15	14.15	7.48	86.00
9/12/2016	1.00	3.00	72.00	4.20	6.40	309.52	267.43	15.60	23.77	7.70	80.00
9/13/2016			73.00	7.10	4.80	321.98	282.05	27.43	18.55	7.43	78.00
9/14/2016			76.00	8.30	8.00	341.65	311.58	34.03	32.80	7.50	78.00
9/15/2016			76.00	9.80	9.60	346.56	316.06	40.76	39.92	7.51	79.00
9/16/2016						355.79				7.49	80.00
9/17/2016						243.34				7.44	82.00
9/18/2016			69.00	6.90	6.80	257.25	213.00	21.30	20.99	7.66	81.00
9/19/2016			76.00	5.90	4.00	254.42	232.03	18.01	12.21	7.28	82.00
9/20/2016			77.00	5.30	4.00	243.27	224.78	15.47	11.68	7.40	78.00
9/21/2016			70.00	9.40	4.00	260.23	218.59	29.35	12.49	7.61	80.00
9/22/2016			69.00	5.00	8.00	303.57	251.36	18.21	29.14	7.53	81.00

9/23/2016					264.16			7.59	76.00		
9/24/2016					322.32			7.66	80.00		
9/25/2016		55.00		5.10	4.00	316.68	247.01	19.38	15.20	7.56	80.00
9/26/2016		62.00		4.50	4.00	302.94	225.39	16.36	14.54	7.73	78.00
9/27/2016		60.00		7.00	4.00	296.75	213.66	24.93	14.24	7.64	76.00
9/28/2016		58.00		4.40	4.00	317.25	220.81	16.75	15.23	7.40	75.00
9/29/2016		60.00		5.40	4.00	338.71	243.87	21.95	16.26	7.35	76.00
9/30/2016						300.39				7.36	75.00
10/1/2016						392.44				7.40	75.00
10/2/2016		70.00		5.00	4.00	276.23	232.03	16.57	13.26	7.51	74.00
10/3/2016		74.00		4.00	5.20	304.32	270.24	14.61	18.99	7.36	77.00
10/4/2016		71.00		4.40	4.40	300.60	255.11	15.87	15.87	7.37	75.00
10/5/2016		67.00		5.90	10.00	292.23	234.99	20.68	35.07	7.66	80.00
10/6/2016		74.00		4.00	4.40	293.25	260.41	14.08	15.48	7.65	78.00
10/7/2016						316.93				7.57	80.00
10/8/2016						319.28				7.20	78.00
10/9/2016		82.00		5.10	6.80	321.37	316.23	19.67	26.22	7.32	76.00
10/10/2016	1.70	18.00	86.00	4.00	4.00	311.95	321.93	14.97	14.97	7.47	74.00
10/11/2016		84.00		6.40	4.00	285.15	287.43	21.90	13.69	7.20	74.00
10/12/2016		86.00		6.20	4.00	266.42	274.95	19.82	12.79	7.17	77.00
10/13/2016		90.00		7.00	4.00	262.19	283.17	22.02	12.59	7.25	74.00
10/14/2016						260.70				7.21	77.00
10/15/2016						272.55				7.11	77.00
10/16/2016		90.00		4.10	8.00	337.60	364.61	16.61	32.41	7.03	77.00
10/17/2016		88.00		8.50	4.00	359.64	379.76	36.68	17.26	7.89	78.00
10/18/2016		86.00		6.90	5.20	393.74	415.79	32.80	24.57	7.17	78.00
10/19/2016		79.00		4.00	4.80	392.44	372.03	18.84	22.60	7.16	77.00
10/20/2016		74.00		4.00	8.40	355.62	315.79	17.07	35.85	7.18	75.00
10/21/2016						361.81				7.35	72.00
10/22/2016						370.31				7.51	72.00

10/23/2016		74.00		8.00	11.00	377.77	335.46	36.27	49.87	7.30	78.00	
10/24/2016		72.00		4.60	7.60	369.16	318.97	20.36	33.67	7.46	74.00	
10/25/2016		61.00		8.70	5.40	352.36	342.49	36.79	27.06	7.48	75.00	
10/26/2016		75.00		5.60	4.00	338.87	304.99	22.77	16.27	7.90	79.00	
10/27/2016		73.00		5.70	4.00	283.92	248.71	19.42	13.63	7.86	78.00	
10/28/2016						277.77				8.01	73.00	
10/29/2016						272.82				7.38	80.00	
10/30/2016		70.00		5.70	4.40	281.33	236.32	19.24	14.85	7.28	80.00	
10/31/2016		68.00		7.90	4.00	269.00	219.50	25.50	12.91	7.60	80.00	
11/1/2016		60.00	78.00	4.00	10.00	319.43	229.99	298.99	15.33	38.33	7.23	78.00
11/2/2016		42.00		8.50	9.20	345.10	173.93	35.20	38.10	7.49	75.00	
11/3/2016		34.00		4.00	16.00	349.41	142.96	16.77	67.09	7.46	78.00	
11/4/2016						321.04				7.19	74.00	
11/5/2016						258.98				7.23	79.00	
11/6/2016		34.00		14.00	20.00	288.65	117.77	48.49	69.26	7.34	80.00	
11/7/2016	1.00	40.00		4.00	8.30	312.92	190.20	15.02	31.17	7.21	75.00	
11/8/2016		41.00	74.00	6.70	5.60	331.30	163.00	294.19	26.64	22.26	7.19	73.00
11/9/2016		42.00		4.00	4.00	372.37	167.67	17.87	17.87	7.28	72.00	
11/10/2016		41.00		6.20	4.00	348.76	171.59	25.95	16.74	7.43	72.00	
11/11/2016						356.48				7.43	70.00	
11/12/2016						363.39				7.21	73.00	
11/13/2016		35.00		5.20	4.40	358.44	150.54	22.37	18.93	7.43	77.00	
11/14/2016		34.00		4.30	4.00	316.03	128.94	16.31	15.17	7.50	75.00	
11/15/2016		33.00	53.00	4.00	10.00	295.91	117.18	188.20	14.20	35.51	7.44	78.00
11/16/2016		25.00		4.00	12.00	301.66	90.50	14.48	43.44	7.63	76.00	
11/17/2016		20.00		4.00	4.00	326.65	78.40	15.68	15.68	7.47	78.00	
11/18/2016						279.93				7.67	77.00	
11/19/2016						269.52				7.48	75.00	
11/20/2016		20.00		4.20	4.00	235.12	56.43	11.85	11.29	7.41	68.00	
11/21/2016		27.00		7.80	8.00	263.43	85.35	24.02	25.29	7.50	69.00	

11/22/2016			29.00		52.00	5.30	16.00	254.76	88.66	158.97	16.20	48.91	7.40	70.00
11/23/2016			33.00			4.30	12.00	252.00	99.79		13.00	36.29	7.50	68.00
11/24/2016			34.00			6.00	4.00	181.47	74.04		13.07	8.71	7.20	68.00
11/25/2016								168.40					7.39	75.00
11/26/2016								263.32					7.42	75.00
11/27/2016			44.00			4.00	12.00	257.34	135.88		12.35	37.06	7.59	75.00
11/28/2016			45.00			14.00	9.60	325.58	175.81		54.70	37.51	7.44	70.00
11/29/2016			47.00		57.00	5.50	4.40	311.66	175.78	213.18	20.57	16.46	7.31	73.00
11/30/2016			48.00			8.60	11.00	236.97	136.49		24.46	31.28	7.29	70.00
12/1/2016			53.00			5.10	4.40	308.42	196.16		18.88	16.28	7.24	70.00
12/2/2016								315.66					7.38	78.00
12/3/2016								258.91					7.34	80.00
12/4/2016			77.00			8.50	15.00	255.65	236.22		26.08	46.02	7.48	80.00
12/5/2016			82.00			4.00	8.80	319.01	313.91		15.31	33.69	7.56	74.00
12/6/2016			84.00		98.00	22.00	16.00	308.34	310.81	362.61	81.40	59.20	7.55	78.00
12/7/2016			81.00			7.30	16.00	225.93	219.60		19.79	43.38	8.18	75.00
12/8/2016			80.00			19.00	9.20	306.68	294.41		69.92	33.86	7.31	72.00
12/9/2016								363.48					7.33	78.00
12/10/2016								347.38					7.61	72.00
12/11/2016			73.00			4.60	4.00	348.43	305.22		19.23	16.72	7.49	70.00
12/12/2016			72.00			20.00	6.40	357.05	308.49		85.69	27.42	7.77	73.00
12/13/2016			73.00		85.00	4.80	4.80	330.53	289.54	337.14	19.04	19.04	7.66	73.00
12/14/2016			70.00			7.70	5.60	315.24	264.80		29.13	21.18	7.72	72.00
12/15/2016	1.00	2.50	66.00			5.40	4.00	288.19	228.25		18.67	13.83	7.64	72.00
12/16/2016				10.00				261.97					7.73	77.00
12/17/2016								290.29					7.42	69.00
12/18/2016			50.00			6.70	6.40	271.41	162.85		21.82	20.84	7.27	68.00
12/19/2016			42.00			7.90	5.20	250.77	126.39		23.77	15.65	8.07	72.00
12/20/2016			39.00		73.00	10.00	4.00	284.66	133.22	249.36	34.16	13.66	7.18	70.00
12/21/2016			39.00			4.00	7.20	309.31	144.76		14.85	26.72	7.51	70.00

12/22/2016					36.00			14.00	4.80	320.15	138.30		53.79	18.44	7.48	73.00	
12/23/2016										276.53					7.55	70.00	
12/24/2016										247.19					7.26	72.00	
12/25/2016					33.00			7.70	33.00	264.41	104.71		24.43	104.71	7.10	72.00	
12/26/2016					18.00			8.20	8.80	225.33	48.67		22.17	23.79	7.21	70.00	
12/27/2016					12.00		63.00	5.00	14.00	227.96	32.83	172.34	13.68	38.30	7.36	69.00	
12/28/2016					8.00			8.50	4.00	176.70	16.96		18.02	8.48	7.19	68.00	
12/29/2016					8.00			10.00	11.00	277.51	26.64		33.30	36.63	7.33	68.00	
12/30/2016										210.54					7.26	75.00	
12/31/2016										186.24					7.20	75.00	
<b>Avg</b>	1.058	2.100	5.000	5.000	5,413.750	78.899	0.010	70.333	8.757	11.617	317.343	302.576	252.775	34.087	44.963	7.506	78.178
<b>Min</b>	1.000	1.000	5.000	5.000	10.000	8.000	0.010	52.000	4.000	4.000	168.400	16.963	158.970	10.823	8.482	7.030	7.500
<b>Max</b>	1.700	3.000	5.000	5.000	*****	120.000	0.010	98.000	58.000	67.000	436.230	514.800	362.608	248.264	262.466	8.180	92.000
<b>Sum</b>																	
<b>30-Day AVG/</b>	<i>48/</i>	<i>31/</i>						<i>28/</i>	<i>25/</i>	<i>636.81</i>			<i>183.5/</i>	<i>229.3/</i>	<i>6/</i>		
<b>Daily MAX</b>	<i>89</i>	<i>46</i>			<i>400</i>	<i>155</i>		<i>48</i>	<i>50</i>		<i>1848.6</i>		<i>477</i>	<i>596.3</i>	<i>9</i>		

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2017      End Date: 12/31/2017

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (#/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (parts/ML)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Plant Effluent Flow (gpm)	Ammonia Load (#/day)	Total Nitrogen (#/day)	tBOD Load (#/day)	TSS Load (#/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2017						5.40				5.20	5.20	140.16	9.08		8.75	8.75	7.22	75.00				
1/2/2017						3.70				4.00	5.20	229.24	10.18		11.00	14.30	7.24	69.00				
1/3/2017						1.40			40.00	4.00	4.00	226.75	3.81	108.84	10.88	10.88	7.08	72.00				
1/4/2017						1.40				4.00	5.20	213.91	3.59		10.27	13.35	7.14	68.00				
1/5/2017						1.20				5.20	8.80	261.05	3.76		16.29	27.57	7.26	70.00				
1/6/2017												242.89					7.20	74.00				
1/7/2017												231.95					7.31	73.00				
1/8/2017						5.40				4.00	5.60	242.15	15.69		11.62	16.27	7.23	72.00				
1/9/2017						4.10				4.00	5.60	256.90	12.64		12.33	17.26	7.20	72.00				
1/10/2017						5.30			50.00	6.10	12.00	287.37	18.28	172.42	21.04	41.38	7.33	74.00				
1/11/2017						4.50				6.00	5.60	279.30	15.06		20.11	18.77	7.29	74.00				
1/12/2017						6.20				4.00	13.00	251.42	18.71		12.07	39.22	7.21	74.00				
1/13/2017												246.96					7.17	74.00				
1/14/2017												221.38					7.45	74.00				
1/15/2017						4.10				4.00	6.40	206.22	10.15		9.90	15.84	7.42	74.00				
1/16/2017						10.00				4.00	8.80	233.98	28.08		11.23	24.71	7.52	75.00				
1/17/2017						15.00			54.00	4.70	8.00	279.79	50.36	181.30	15.78	26.86	7.72	75.00				
1/18/2017						27.00				5.10	7.20	302.45	97.99		18.51	26.13	7.35	75.00				
1/19/2017						29.00				6.60	4.40	294.02	102.32		23.29	15.52	7.41	75.00				
1/20/2017	1.80				10.00							251.44					7.42	68.00				
1/21/2017												371.78					7.45	72.00				
1/22/2017						38.00				7.00	12.00	339.72	146.76		28.54	48.92	7.17	72.00				
1/23/2017						31.00				6.60	6.00	357.53	133.00		28.32	25.74	7.15	76.00				
1/24/2017						36.00			73.00	4.00	4.00	386.30	166.88	338.40	18.54	18.54	7.24	75.00				
1/25/2017						42.00				5.40	4.00	353.74	178.28		22.92	16.98	7.37	77.00				
1/26/2017						49.00				4.70	4.40	278.85	163.96		15.73	14.72	7.43	76.00				

1/27/2017						251.02				7.29	74.00						
1/28/2017						291.84				7.24	73.00						
1/29/2017			52.00		6.20	5.20	288.22	179.85	21.44	17.98	7.21	72.00					
1/30/2017			48.00		4.00	5.60	334.89	192.90	16.07	22.50	7.25	74.00					
1/31/2017			43.00		96.00	7.70	10.00	402.89	207.89	464.13	37.23	48.35	7.21	70.00			
2/1/2017			47.00			4.10	6.00	371.29	209.41		18.27	26.73	7.29	72.00			
2/2/2017			39.00			5.50	5.60	249.35	116.70		16.46	16.76	7.22	70.00			
2/3/2017								300.38					7.11	73.00			
2/4/2017								236.48					7.10	72.00			
2/5/2017	4.00	1.00				4.00	14.00	258.22	136.34		12.39	43.38	7.12	75.00			
2/6/2017			10.00	50.00		6.70	18.00	282.23	169.34		22.69	60.96	7.14	69.00			
2/7/2017				53.00		99.00	5.60	8.80	328.67	209.03	390.46	22.09	34.71	7.46	75.00		
2/8/2017				46.00			6.50	7.20	346.18	191.09		27.00	29.91	7.22	72.00		
2/9/2017				42.00			7.00	7.60	353.78	178.31		29.72	32.26	7.03	68.00		
2/10/2017								409.04						7.09	73.00		
2/11/2017								365.10						7.09	74.00		
2/12/2017				27.00			5.10	4.40	370.01	119.88		22.64	19.54	7.34	75.00		
2/13/2017				19.00			4.00	8.40	288.04	65.67		13.63	29.03	7.21	72.00		
2/14/2017				18.00			66.00	6.30	8.00	341.51	73.77	270.48	25.82	24.59	7.32	80.00	
2/15/2017				15.00				6.90	7.20	325.32	58.56		26.94	28.11	7.28	78.00	
2/16/2017				19.00				4.00	4.00	341.07	77.76		16.37	16.37	7.27	77.00	
2/17/2017									356.02						7.08	70.00	
2/18/2017									351.16						7.22	72.00	
2/19/2017				17.00				18.00	13.00	349.87	71.37		75.57	54.58	7.25	75.00	
2/20/2017				21.00				4.00	14.00	353.96	89.20		15.99	59.47	7.52	79.00	
2/21/2017				22.00				59.00	4.00	7.20	366.69	96.81	259.62	17.60	31.68	7.21	75.00
2/22/2017				27.00					6.10	12.00	371.74	120.44		27.21	53.53	7.16	73.00
2/23/2017				34.00					4.70	8.00	272.27	111.09		15.36	26.14	7.21	75.00
2/24/2017											332.89					7.26	72.00
2/25/2017											355.53					6.84	68.00

2/26/2017					44.00		5.40	4.00	333.83	176.26		21.63	16.02	6.93	69.00
2/27/2017					39.00		4.00	4.00	326.63	152.86		15.68	15.68	7.07	73.00
2/28/2017					48.00	65.00	4.00	4.00	353.19	203.44	275.49	16.95	16.95	7.14	79.00
3/1/2017					57.00		5.00	4.00	337.38	230.77		20.24	16.19	7.50	79.00
3/2/2017					68.00		4.00	4.00	317.54	259.11		15.24	15.24	7.35	77.00
3/3/2017									325.15					7.53	76.00
3/4/2017									314.43					7.33	76.00
3/5/2017					77.00		5.00	4.00	319.84	295.53		19.19	15.35	7.42	76.00
3/6/2017					88.00		6.50	6.00	316.60	334.33		24.69	22.80	7.44	73.00
3/7/2017					90.00	99.00	7.20	4.00	331.96	358.52	394.37	28.68	15.93	7.37	73.00
3/8/2017					94.00		9.40	4.80	339.97	383.49		38.35	19.58	7.65	73.00
3/9/2017	1.00	1.00	5.00		92.00	0.010	6.30	4.00	362.26	399.94		27.39	17.39	7.70	72.00
3/10/2017				10.00					362.65					7.28	75.00
3/11/2017									357.98					7.39	75.00
3/12/2017					94.00		8.20	4.00	365.22	411.97		35.94	17.53	7.56	75.00
3/13/2017					89.00		6.10	4.00	369.39	394.51		27.04	17.73	8.19	75.00
3/14/2017					85.00	93.00	5.10	4.00	354.39	361.48	395.50	21.69	17.01	7.79	77.00
3/15/2017					83.00		4.00	4.00	368.14	366.67		17.67	17.67	6.78	73.00
3/16/2017					87.00		5.10	9.20	373.09	389.51		22.83	41.19	7.05	75.00
3/17/2017									375.57					7.57	77.00
3/18/2017									369.78					7.76	76.00
3/19/2017					87.00		5.30	10.00	382.39	399.22		24.32	45.89	7.94	77.00
3/20/2017					87.00		4.50	11.00	419.10	437.54		22.63	55.32	7.72	79.00
3/21/2017					85.00	87.00	6.10	4.80	427.26	435.81	446.06	31.28	24.61	7.87	75.00
3/22/2017					86.00		7.10	6.40	309.09	318.98		26.33	23.74	8.31	75.00
3/23/2017					82.00		9.30	10.00	381.93	375.82		42.62	45.83	7.43	76.00
3/24/2017									351.77					7.71	77.00
3/25/2017									357.85					7.72	74.00
3/26/2017					83.00		20.00	8.00	368.16	366.69		88.36	35.34	7.77	75.00
3/27/2017					82.00		7.90	9.20	343.62	338.12		32.58	37.94	7.72	75.00

3/28/2017		85.00		94.00	6.30	8.00	363.44	375.07	409.96	27.46	34.89	7.74	79.00
3/29/2017		87.00			15.00	8.00	363.13	379.11		65.36	34.86	7.63	75.00
3/30/2017		86.00			4.50	9.20	405.20	416.17		21.88	44.73	7.64	77.00
3/31/2017							379.78					7.90	75.00
4/1/2017							368.78					7.59	75.00
4/2/2017	1.00	10.00	86.00		6.10	10.00	375.53	387.55		27.49	45.06	7.59	72.00
4/3/2017			87.00		4.10	6.40	412.64	430.80		20.30	31.69	7.59	80.00
4/4/2017			88.00	90.00	4.00	9.60	420.73	444.29	454.39	20.20	48.47	7.75	62.00
4/5/2017			86.00		9.90	10.00	437.52	451.52		51.98	52.50	7.64	79.00
4/6/2017			78.00		5.00	16.00	435.71	407.82		26.14	83.66	7.78	73.00
4/7/2017							437.05					7.59	75.00
4/8/2017							376.64					7.37	72.00
4/9/2017			74.00		8.20	20.00	372.76	331.01		36.68	89.46	7.48	75.00
4/10/2017			72.00		4.30	20.00	425.25	367.42		21.94	102.08	7.47	78.00
4/11/2017			77.00	89.00	5.00	17.00	428.54	395.97	457.68	25.71	67.42	7.39	74.00
4/12/2017			79.00		4.60	21.00	340.30	322.60		18.78	85.76	7.58	75.00
4/13/2017			82.00		6.70	22.00	360.22	354.46		28.96	95.10	7.52	74.00
4/14/2017							346.90					7.51	75.00
4/15/2017							332.15					7.50	75.00
4/16/2017			95.00		11.00	41.00	366.62	417.95		48.39	180.38	7.50	75.00
4/17/2017			96.00		9.80	28.00	387.57	446.48		45.58	130.22	7.58	75.00
4/18/2017			93.00	97.00	7.60	25.00	333.48	372.16	388.17	30.41	100.04	8.09	73.00
4/19/2017			94.00		7.20	23.00	353.29	398.51		30.52	97.51	7.40	79.00
4/20/2017			90.00		9.00	24.00	351.85	380.00		38.00	101.33	7.50	77.00
4/21/2017							344.66					7.32	73.00
4/22/2017							354.81					7.44	76.00
4/23/2017			80.00		5.90	8.60	346.21	332.36		24.51	36.56	7.49	74.00
4/24/2017			74.00		4.00	8.80	352.02	312.59		16.90	37.17	7.38	72.00
4/25/2017			73.00	80.00	4.90	15.00	350.61	307.13	336.59	20.62	63.11	7.49	72.00
4/26/2017			71.00		4.00	10.00	339.46	289.22		16.29	40.74	8.06	75.00

4/27/2017		75.00		4.80	7.60	331.55	298.40	19.10	30.24	7.35	68.00	
4/28/2017						332.90				7.19	76.00	
4/29/2017						496.35				7.51	74.00	
4/30/2017		60.00		4.00	4.40	388.71	279.87	18.66	20.52	7.53	68.00	
5/1/2017		60.00		6.70	6.40	349.50	251.64	28.10	26.84	7.57	75.00	
5/2/2017		63.00	70.00	6.60	6.40	342.31	258.79	287.54	27.11	26.29	7.57	73.00
5/3/2017		64.00		6.60	4.00	327.23	251.31	25.92	15.71	7.36	73.00	
5/4/2017		68.00		9.10	5.60	340.62	277.95	37.20	22.89	7.45	72.00	
5/5/2017						334.63				7.54	72.00	
5/6/2017						321.02				7.53	70.00	
5/7/2017		91.00		7.20	5.60	344.06	375.71	29.73	23.12	7.57	74.00	
5/8/2017	1.00	10.00	93.00	9.80	7.20	344.26	384.19	40.48	29.74	7.58	74.00	
5/9/2017		100.00	99.00	11.00	4.80	376.75	452.10	447.58	49.73	21.70	7.70	72.00
5/10/2017		98.00		10.00	19.00	386.28	454.27	46.35	88.07	7.68	76.00	
5/11/2017		100.00		16.00	6.00	372.07	446.48	71.44	26.79	8.04	76.00	
5/12/2017						367.63				7.70	71.00	
5/13/2017						374.35				7.67	77.00	
5/14/2017		90.00		7.70	6.00	374.19	404.13	34.58	26.94	7.56	80.00	
5/15/2017		97.00		13.00	10.00	371.80	432.78	58.00	44.62	7.70	80.00	
5/16/2017		89.00	110.00	14.00	8.80	354.17	378.25	467.50	59.50	37.40	7.46	82.00
5/17/2017		89.00		15.00	8.80	342.63	365.93	61.67	36.18	7.66	79.00	
5/18/2017		90.00		9.50	7.60	365.45	394.69	41.66	33.33	7.55	80.00	
5/19/2017						370.95				7.62	75.00	
5/20/2017						324.05				7.53	77.00	
5/21/2017		90.00		10.00	9.20	358.91	387.62	43.07	39.62	7.17	75.00	
5/22/2017		84.00		12.00	14.00	328.96	331.59	47.37	55.27	7.63	73.00	
5/23/2017		83.00	97.00	5.10	5.20	353.69	352.28	411.70	21.65	22.07	8.08	73.00
5/24/2017		86.00		11.00	6.40	368.97	380.78	48.70	28.34	7.61	73.00	
5/25/2017		83.00		7.90	6.40	364.13	362.67	34.52	27.97	7.40	73.00	
5/26/2017						366.44				7.49	79.00	

5/27/2017											365.41					7.23	80.00
5/28/2017			67.00			8.70	8.80	371.05	298.32		38.74	39.18	7.25				79.00
5/29/2017			56.00			5.50	9.60	371.28	249.50		24.50	42.77	6.97				80.00
5/30/2017			57.00		96.00	18.00	8.80	369.45	252.70	425.61	79.80	39.01	7.57				75.00
5/31/2017			56.00			9.30	9.20	375.79	252.53		41.94	41.49	7.21				79.00
6/1/2017			54.00			7.90	6.40	385.62	249.88		36.56	29.62	7.31				77.00
6/2/2017								372.12					7.18				80.00
6/3/2017								362.75					7.52				82.00
6/4/2017			48.00			5.00	10.00	374.78	215.87		22.49	44.97	7.58				80.00
6/5/2017	1.00	1.00		10.00		4.70	5.20	368.93	185.94		20.81	23.02	7.58				80.00
6/6/2017			39.00		79.00	5.00	4.80	370.71	173.49	351.43	22.24	21.35	7.58				80.00
6/7/2017			39.00			5.90	4.00	380.05	177.86		26.91	18.24	7.36				80.00
6/8/2017			32.00			4.60	6.00	389.01	149.38		21.47	28.01	7.15				80.00
6/9/2017								396.61					7.50				81.00
6/10/2017								398.96					7.43				80.00
6/11/2017			36.00			4.00	4.00	398.06	171.96		19.11	19.11	7.52				84.00
6/12/2017			34.00			5.20	6.80	359.68	146.75		22.44	29.35	7.30				82.00
6/13/2017			32.00		53.00	14.00	7.20	385.51	148.04	245.18	64.77	33.31	7.40				84.00
6/14/2017			30.00			4.00	4.00	390.76	140.67		18.76	18.76	7.42				82.00
6/15/2017			33.00			7.20	4.00	381.04	150.89		32.92	18.29	7.44				84.00
6/16/2017								384.78					7.97				82.00
6/17/2017													7.26				84.00
6/18/2017			35.00			4.60	9.60	379.92	159.57		20.97	43.77	7.18				82.00
6/19/2017			38.00			13.00	6.00	374.05	170.57		58.35	26.93	7.43				80.00
6/20/2017			36.00		68.00	9.70	7.20	286.62	123.82	233.88	33.36	24.76	7.39				80.00
6/21/2017			39.00			14.00	4.00	301.63	141.16		50.67	14.48	7.26				80.00
6/22/2017			40.00			4.00	4.00	353.00	169.44		16.94	16.94	7.40				82.00
6/23/2017								346.39					7.40				82.00
6/24/2017								341.34					7.09				82.00
6/25/2017			40.00			4.00	7.60	334.43	160.53		16.05	30.50	7.22				82.00

6/26/2017		39.00		14.00	8.00	340.77	159.48	57.25	32.71	8.03	77.00		
6/27/2017		40.00		72.00	5.70	4.00	291.89	140.11	252.19	19.97	14.01	6.95	73.00
6/28/2017		42.00			12.00	5.20	302.36	152.39		43.54	18.87	7.29	75.00
6/29/2017		47.00			5.60	6.40	288.50	162.71		19.39	22.16	7.20	77.00
6/30/2017							337.77					7.47	80.00
7/1/2017							331.53					7.71	80.00
7/2/2017		39.00			9.30	4.80	313.97	146.94		35.04	16.08	7.82	80.00
7/3/2017		30.00			5.00	6.80	273.11	98.32		16.39	22.29	8.10	84.00
7/4/2017		26.00		55.00	8.60	4.00	252.53	78.79	166.67	26.06	12.12	7.76	75.00
7/5/2017		24.00			7.50	4.00	313.26	90.22		28.19	15.04	7.91	76.00
7/6/2017		23.00			6.30	4.80	358.29	98.89		27.09	20.64	7.76	82.00
7/7/2017							352.54					7.91	75.00
7/8/2017							353.72					7.49	75.00
7/9/2017		29.00			4.00	13.00	343.02	119.37		16.46	53.51	7.55	79.00
7/10/2017	2.10	10.00	35.00		14.00	6.00	339.39	134.40		57.02	24.44	7.52	77.00
7/11/2017		37.00		59.00	4.90	4.00	337.13	149.69	238.69	19.82	16.18	7.05	79.00
7/12/2017		43.00			5.80	4.00	340.38	175.64		23.69	16.34	7.74	77.00
7/13/2017		42.00			8.00	6.00	349.81	176.30		37.78	25.19	7.38	77.00
7/14/2017							407.17					7.33	82.00
7/15/2017							284.47					7.23	78.00
7/16/2017		48.00			9.50	6.80	305.10	175.74		34.78	24.90	7.13	80.00
7/17/2017		50.00			8.20	10.00	330.42	198.25		32.51	39.65	7.78	82.00
7/18/2017		53.00		78.00	12.00	5.20	353.63	224.91	331.00	50.92	22.07	7.00	84.00
7/19/2017		54.00			7.00	8.00	354.61	229.79		29.79	34.04	7.55	82.00
7/20/2017		54.00			14.00	8.00	343.70	222.72		57.74	33.00	7.59	84.00
7/21/2017							351.75					7.34	86.00
7/22/2017							386.90					7.11	84.00
7/23/2017		48.00			8.00	12.00	370.85	213.61		26.70	53.40	7.14	86.00
7/24/2017		39.00			11.00	4.00	338.92	158.61		44.74	15.27	7.19	86.00
7/25/2017		33.00		57.00	5.30	5.60	289.29	114.56	197.87	18.40	19.44	7.13	84.00

7/26/2017				31.00		7.40	5.20	284.01	105.65	25.22	17.72	7.27	86.00	
7/27/2017				41.00		4.00	4.00	303.36	149.25	14.56	14.56	7.42	86.00	
7/28/2017								352.13				7.42	79.00	
7/29/2017								382.26				7.47	79.00	
7/30/2017				68.00		11.00	6.40	374.62	305.69	49.45	28.77	7.66	79.00	
7/31/2017				68.00		7.00	7.20	434.53	354.58	36.50	37.54	7.49	82.00	
8/1/2017				75.00	87.00	6.50	4.00	435.84	392.26	455.02	44.46	20.92	82.00	
8/2/2017				85.00		10.00	4.00	390.06	397.86	46.81	18.72	7.33	82.00	
8/3/2017				80.00		6.60	7.20	384.81	369.42	30.48	33.25	7.71	81.00	
8/4/2017								374.52				7.54	86.00	
8/5/2017								358.88				7.66	86.00	
8/6/2017				85.00		9.00	4.00	363.81	371.09	39.29	17.46	7.44	88.00	
8/7/2017				80.00		10.00	13.00	384.91	369.51	46.19	60.05	7.66	88.00	
8/8/2017				80.00	93.00	13.00	12.00	374.31	359.34	417.73	58.39	53.90	7.52	84.00
8/9/2017				78.00		9.00	20.00	368.16	344.62	39.76	88.36	8.03	86.00	
8/10/2017				76.00		16.00	19.00	361.87	330.03	69.48	82.51	7.92	88.00	
8/11/2017								366.30				7.94	84.00	
8/12/2017								358.24				7.43	86.00	
8/13/2017	1.00	1.70	10.00	74.00		8.60	11.00	286.32	254.25	29.55	37.79	7.86	82.00	
8/14/2017				66.00		12.00	15.00	200.07	158.46	28.81	36.01	7.54	82.00	
8/15/2017				59.00	80.00	7.40	11.00	248.71	176.09	238.76	22.09	32.83	7.64	81.00
8/16/2017				63.00		8.20	10.00	309.69	234.13	30.47	37.16	7.56	86.00	
8/17/2017				57.00		8.30	19.00	316.82	216.70	31.56	72.23	7.58	86.00	
8/18/2017								361.26				7.61	78.00	
8/19/2017								322.25				7.55	78.00	
8/20/2017				41.00		7.60	10.00	265.51	130.63	24.21	31.86	7.74	61.00	
8/21/2017				40.00		6.00	15.00	316.38	151.66	22.78	56.95	7.45	80.00	
8/22/2017				39.00	56.00	5.60	4.00	350.63	164.09	235.62	23.56	16.83	7.62	80.00
8/23/2017				37.00		9.40	6.00	358.45	159.15	40.43	25.81	7.46	78.00	
8/24/2017				36.00		14.00	14.00	360.38	155.68	60.54	60.54	7.53	79.00	



9/24/2017		80.00			9.90	10.00	315.27	302.66		37.45	37.83	7.65	85.00	
9/25/2017		80.00				27.00	22.00	318.46	305.74		103.19	84.06	7.47	82.00
9/26/2017		77.00		82.00	5.40	4.00	320.46	296.11	315.33	20.77	15.36	7.87	86.00	
9/27/2017		78.00			5.80	9.20	311.67	291.72		21.69	34.41	7.72	84.00	
9/28/2017		75.00			8.20	10.00	321.96	289.76		31.68	38.64	7.65	80.00	
9/29/2017							311.73					7.90	77.00	
9/30/2017							307.13					7.47	79.00	
10/1/2017		84.00			4.90	9.60	322.19	247.44		18.94	37.12	7.29	78.00	
10/2/2017		55.00			11.00	14.00	333.72	220.26		44.05	56.06	7.30	82.00	
10/3/2017		54.00		82.00	8.30	20.00	336.18	217.84	250.12	33.48	80.66	7.26	80.00	
10/4/2017		55.00			9.60	11.00	336.31	221.96		38.74	44.39	7.63	80.00	
10/5/2017		59.00			16.00	22.00	330.26	233.82		63.41	67.19	7.37	84.00	
10/6/2017							324.74					7.46	79.00	
10/7/2017							324.82					7.54	79.00	
10/8/2017		80.00			16.00	32.00	318.84	307.05		61.41	122.82	7.32	81.00	
10/9/2017	1.00	90.00	81.00		11.00	24.00	316.08	307.23		41.72	91.03	7.97	79.00	
10/10/2017		84.00		94.00	9.20	26.00	333.79	336.46	376.52	36.85	104.14	7.93	82.00	
10/11/2017		85.00			10.00	29.00	418.69	427.06		50.24	145.70	7.29	76.00	
10/12/2017		87.00			8.10	24.00	392.16	409.42		38.12	112.94	7.34	77.00	
10/13/2017							370.51					7.17	78.00	
10/14/2017							392.48					7.42	80.00	
10/15/2017		76.00			11.00	26.00	426.53	389.00		56.30	133.08	7.49	78.00	
10/16/2017		72.00			20.00	18.00	422.86	365.35		101.49	91.34	7.46	73.00	
10/17/2017		89.00		74.00	6.40	26.00	426.12	352.83	378.39	32.73	132.95	7.23	70.00	
10/18/2017		70.00			17.00	24.00	417.16	350.41		65.10	120.14	7.76	72.00	
10/19/2017		66.00			8.90	12.00	406.34	321.82		43.40	58.51	7.90	70.00	
10/20/2017							407.91					7.79	76.00	
10/21/2017							412.48					7.07	74.00	
10/22/2017		58.00			5.20	21.00	412.34	286.99		25.73	103.91	7.40	78.00	
10/23/2017		60.00			6.90	22.00	395.86	285.02		42.28	104.51	7.76	77.00	

10/24/2017			66.00		78.00	11.00	21.00	392.96	311.22	367.81	51.87	99.03	7.62	75.00
10/25/2017			62.00			7.20	21.00	380.77	283.29		32.90	95.95	7.33	75.00
10/26/2017			67.00			11.00	18.00	345.57	277.84		45.62	74.64	7.20	75.00
10/27/2017								311.46					7.25	70.00
10/28/2017								308.38					7.28	72.00
10/29/2017			79.00			6.20	18.00	299.92	284.32		22.31	64.78	7.38	70.00
10/30/2017			79.00			8.20	22.00	337.92	320.35		33.25	89.21	7.36	76.00
10/31/2017			83.00		90.00	4.00	15.00	372.18	370.69	401.95	17.86	66.99	7.32	70.00
11/1/2017			85.00			6.60	14.00	377.47	385.02		29.90	63.41	7.52	72.00
11/2/2017			85.00			5.50	15.00	402.41	410.46		26.56	72.43	7.49	72.00
11/3/2017								350.27					7.32	78.00
11/4/2017								352.79					6.81	80.00
11/5/2017			88.00			4.00	20.00	346.81	368.34		16.74	83.71	6.98	79.00
11/6/2017			89.00			5.40	19.00	360.54	385.06		23.36	82.20	7.33	73.00
11/7/2017			85.00		100.00	5.20	16.00	359.99	367.19	431.99	22.46	69.12	7.41	69.00
11/8/2017			90.00			7.90	21.00	361.06	389.94		34.23	90.99	7.30	72.00
11/9/2017			86.00			14.00	20.00	363.32	374.95		61.04	87.20	7.28	75.00
11/10/2017								366.47					7.25	75.00
11/11/2017								366.83					7.32	75.00
11/12/2017			75.00			6.00	18.00	358.83	322.95		25.84	77.51	7.47	73.00
11/13/2017	1.00	5.30	1,000.00	80.00		5.40	30.00	351.14	337.09		22.75	126.41	7.38	76.00
11/14/2017			62.00		97.00	14.00	31.00	341.49	336.03	397.49	57.37	127.03	7.30	70.00
11/15/2017			84.00			6.00	30.00	347.11	349.89		24.99	124.96	7.12	76.00
11/16/2017			81.00			5.90	32.00	354.55	344.62		25.10	136.15	6.94	72.00
11/17/2017								351.78					7.57	73.00
11/18/2017								351.64					7.62	73.00
11/19/2017			10.00	72.00		4.00	21.00	358.02	310.19		17.23	90.47	7.46	70.00
11/20/2017			64.00			4.30	22.00	345.92	265.67		17.85	91.32	7.36	75.00
11/21/2017			61.00		73.00	6.70	20.00	366.15	268.02	320.75	28.44	87.88	7.34	75.00
11/22/2017			54.00			4.00	14.00	322.61	209.05		15.49	54.20	7.34	75.00



12/23/2017									274.72				7.34	70.00		
12/24/2017				87.00			5.50	16.00	268.09	279.89		17.69	51.47	7.26	70.00	
12/25/2017				85.00			4.00	17.00	302.01	308.05		14.50	61.61	6.84	69.00	
12/26/2017				78.00		89.00	4.00	18.00	284.10	265.92	303.42	13.64	61.37	7.02	67.00	
12/27/2017				71.00			4.50	14.00	199.23	169.74		10.76	33.47	7.37	68.00	
12/28/2017				68.00			5.00	13.00	160.11	130.65		9.61	24.98	7.32	68.00	
12/29/2017									187.94					7.52	69.00	
12/30/2017									125.15					6.74	68.00	
12/31/2017				86.00			4.40	13.00	184.28	145.95		9.73	28.75	6.91	68.00	
<b>Avg</b>	1.408	2.614	5.000	88.929	58.907	0.010	77.135	7.747	13.247	336.954	245.186	322.905	31.882	53.900	7.443	76.597
<b>Min</b>	1.000	1.000	5.000	10.000	1.200	0.010	40.000	4.000	4.000	125.150	3.594	108.840	8.746	8.746	6.640	67.000
<b>Max</b>	4.000	7.300	5.000	1,000.000	100.000	0.010	110.000	27.000	-48.000	496.350	454.265	467.504	103.188	207.164	8.310	88.000
<b>Sum</b>										*****						
<b>30-Day AVG/</b>	<i>40/</i>	<i>21/</i>		<i>400</i>	<i>155</i>		<i>20/</i>	<i>25/</i>	<i>636.81</i>			<i>183.5/</i>	<i>229.3/</i>	<i>6/</i>		
<b>Daily MAX</b>	<i>89</i>	<i>46</i>					<i>48</i>	<i>50</i>		<i>1848.6</i>		<i>477</i>	<i>596.3</i>	<i>9</i>		

**DMR Support Data - Plant Effluent**

Start Date: 1/1/2018 - End Date: 12/31/2018

Date	MeCL2 (ug/l)	Chloroform (ug/l)	Toluene (ug/l)	Vinyl Chloride (ug/L)	Fecal Coliform (l/100 mL)	Ammonia (mg/L)	Phenol (mg/L)	Residual Chlorine (parts/100)	Total Nitrogen (mg/l)	tBOD (mg/l)	TSS (mg/l)	Plant Effluent Flow (gpm)	Ammonia Load (lb/day)	Total Nitrogen (lb/day)	tBOD Load (lb/day)	TSS Load (lb/day)	pH	Temp. (°F)	Diffuser Ammonia (mg/l)	IEPA TSS (mg/l)	IEPA Ammonia (mg/l)	IEPA BOD (mg/l)
1/1/2018						66.00				4.00	14.00	170.35	134.92		8.18	28.62	7.44	68.00				
1/2/2018												165.91					7.39	66.00				
1/3/2018						60.00				4.00	18.00	217.54	156.63		10.44	46.99	7.38	70.00				
1/4/2018						62.00				4.00	16.00	243.71	181.32		11.70	46.79	7.84	66.00				
1/5/2018												264.59					7.45	70.00				
1/6/2018												293.75					7.25	68.00				
1/7/2018						62.00				5.40	19.00	237.19	176.47		15.37	54.08	7.46	70.00				
1/8/2018	1.00				45.00	66.00				5.20	18.00	242.74	192.25		15.15	52.43	7.52	75.00				
1/9/2018						73.00			85.00	4.80	18.00	276.24	243.74	287.14	16.03	60.10	7.70	73.00				
1/10/2018						69.00				5.20	19.00	358.39	296.75		22.36	81.71	7.51	75.00				
1/11/2018						69.00				4.70	20.00	360.64	298.61		20.34	86.55	7.49	77.00				
1/12/2018												396.10					7.62	68.00				
1/13/2018												319.14					7.42	68.00				
1/14/2018						62.00				5.90	23.00	326.77	243.12		23.14	90.19	7.73	68.00				
1/15/2018						63.00				5.50	26.00	334.80	253.11		22.10	104.46	7.78	72.00				
1/16/2018						64.00			79.00	5.80	32.00	331.07	254.26	313.85	23.04	127.13	7.56	72.00				
1/17/2018						72.00				6.20	30.00	323.41	279.43		24.06	116.43	7.53	72.00				
1/18/2018						85.00				6.80	42.00	329.30	335.89		26.87	165.97	7.55	72.00				
1/19/2018												325.85					7.62	70.00				
1/20/2018												355.04					7.75	68.00				
1/21/2018						110.00				5.60	31.00	324.34	426.13		21.80	120.65	7.51	75.00				
1/22/2018						110.00				5.60	34.00	340.64	449.64		22.89	138.98	7.62	68.00				
1/23/2018						110.00			110.00	8.60	30.00	381.30	503.32	503.32	39.35	137.27	7.65	70.00				
1/24/2018						99.00				6.10	25.00	401.94	477.50		29.42	120.58	7.60	70.00				
1/25/2018						92.00				6.00	24.00	387.75	428.08		27.92	111.67	7.52	70.00				
1/26/2018												375.50					7.33	69.00				

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\*AS 2019-002\*\*

1/27/2018					353.35				7.27	70.00		
1/28/2018	96.00		8.40	27.00	338.91	390.42	34.16	109.81	7.40	70.00		
1/29/2018	95.00		9.00	24.00	294.36	335.57	31.79	84.78	7.37	73.00		
1/30/2018	97.00	120.00	7.20	25.00	277.41	322.91	399.47	23.97	83.22	7.52	73.00	
1/31/2018	94.00		5.00	21.00	258.15	291.19	15.49	65.05	7.53	72.00		
2/1/2018	93.00		5.10	18.00	259.52	289.62	15.88	56.06	7.48	70.00		
2/2/2018					300.07				7.40	72.00		
2/3/2018					326.09				7.52	73.00		
2/4/2018	67.00		4.00	12.00	303.21	243.78	14.55	43.66	7.35	73.00		
2/5/2018	1.00	150.00	65.00	7.70	15.00	291.16	227.10	26.90	52.41	7.50	68.00	
2/6/2018	63.00		72.00	5.70	14.00	295.23	223.19	255.08	20.19	49.60	7.01	66.00
2/7/2018	57.00			6.90	14.00	351.30	240.29	29.09	59.02	6.95	68.00	
2/8/2018	59.00			4.00	11.00	353.51	250.29	16.97	46.66	7.19	68.00	
2/9/2018					340.80				7.24	69.00		
2/10/2018					328.94				7.63	70.00		
2/11/2018	65.00			7.00	16.00	315.34	245.97	26.49	60.55	7.54	69.00	
2/12/2018	71.00			7.00	16.00	320.14	272.76	26.89	61.47	7.43	70.00	
2/13/2018	70.00		85.00	9.60	18.00	330.64	277.74	337.25	38.09	71.42	7.49	72.00
2/14/2018	68.00			5.80	17.00	330.64	269.80	23.01	67.45	7.38	73.00	
2/15/2018	69.00			7.00	18.00	345.41	286.00	29.01	74.61	7.39	75.00	
2/16/2018					353.86				7.56	73.00		
2/17/2018					386.76				7.57	71.00		
2/18/2018	74.00			6.20	20.00	396.85	352.40	29.53	95.24	7.51	69.00	
2/19/2018	77.00			5.60	21.00	366.21	338.38	24.61	92.28	7.44	72.00	
2/20/2018	68.00		83.00	4.00	17.00	350.06	285.65	348.66	16.80	71.41	7.56	78.00
2/21/2018	74.00			7.60	18.00	342.83	304.43	31.27	74.05	7.59	70.00	
2/22/2018	68.00			7.40	16.00	343.86	280.59	30.53	66.02	7.68	70.00	
2/23/2018					336.16				7.56	66.00		
2/24/2018					312.93				7.14	73.00		
2/25/2018	67.00			4.20	10.00	274.54	220.73	13.84	32.94	7.17	72.00	

2/26/2018						71.00			8.30	16.00	227.37	193.72		22.65	43.66	7.03	68.00
2/27/2018						72.00	82.00		4.70	16.00	276.61	238.99	272.18	15.60	53.11	7.31	73.00
2/28/2018						67.00			5.10	16.00	305.22	245.40		18.68	58.60	7.48	73.00
3/1/2018						68.00			7.10	22.00	314.69	256.79		26.81	83.08	7.53	72.00
3/2/2018											273.78					7.47	77.00
3/3/2018											298.18					7.45	77.00
3/4/2018						82.00			10.00	47.00	294.72	290.00		35.37	166.22	7.44	77.00
3/5/2018	1.00	1.00			3,600.00	91.00			7.50	46.00	308.73	337.13		27.79	170.42	7.47	72.00
3/6/2018						93.00	96.00		12.00	50.00	320.48	357.66	369.19	46.15	192.29	7.50	74.00
3/7/2018						100.00			8.30	47.00	294.81	353.77		29.36	166.27	7.08	72.00
3/8/2018						100.00			11.00	44.00	273.11	327.73		36.05	144.20	7.53	72.00
3/9/2018											274.87					7.55	72.00
3/10/2018											294.75					7.66	70.00
3/11/2018					200.00	110.00			8.40	37.00	288.38	380.66		29.07	128.04	7.66	72.00
3/12/2018						110.00			21.00	33.00	281.92	372.13		71.04	111.64	7.87	75.00
3/13/2018						110.00	100.00		6.70	33.00	295.26	389.74	354.31	23.74	116.92	7.78	75.00
3/14/2018						110.00			10.00	26.00	293.90	387.95		35.27	91.70	7.46	74.00
3/15/2018						110.00			6.40	11.00	287.87	379.99		22.11	38.00	7.37	77.00
3/16/2018											165.03					7.52	72.00
3/17/2018											276.00					7.34	70.00
3/18/2018	45.00	6.60	5.00	5.00	81.00	110.00	10.000		5.10	14.00	350.80	463.06		21.47	58.93	7.66	74.00
3/19/2018						110.00			4.40	12.00	330.05	435.67		17.43	47.53	7.31	75.00
3/20/2018						100.00	98.00		4.40	17.00	370.35	444.42	435.53	19.55	75.55	7.39	74.00
3/21/2018						95.00			4.40	11.00	375.31	427.85		19.82	49.54	7.46	72.00
3/22/2018						93.00			5.50	12.00	365.78	408.21		24.14	52.67	7.54	70.00
3/23/2018											316.28					7.40	73.00
3/24/2018											314.16					7.15	74.00
3/25/2018						93.00			5.00	18.00	328.14	366.20		19.69	70.88	7.53	72.00
3/26/2018						94.00			5.90	18.00	277.82	313.38		19.67	60.01	7.19	70.00
3/27/2018						97.00	95.00		4.90	18.00	278.45	324.12	317.43	16.37	60.15	7.16	70.00

3/28/2018		100.00			6.10	12.00	268.77	322.52		19.67	38.70	7.39	70.00
3/29/2018		110.00			5.40	9.20	284.58	375.65		18.44	31.42	7.48	72.00
3/30/2018							312.87					7.00	77.00
3/31/2018							325.32					7.43	77.00
4/1/2018		120.00			21.00	16.00	298.78	430.24		75.29	57.37	7.34	75.00
4/2/2018		110.00			8.50	16.00	309.53	408.58		31.57	59.43	7.46	72.00
4/3/2018		100.00		150.00	10.00	31.00	305.68	366.82	550.22	36.68	113.71	7.40	72.00
4/4/2018		92.00		130.00	20.00	22.00	306.74	338.64	478.51	73.62	80.98	7.35	72.00
4/5/2018		80.00			33.00	71.00	294.36	282.59		116.57	250.79	7.27	73.00
4/6/2018							327.06					7.44	71.00
4/7/2018							309.69					7.56	70.00
4/8/2018		89.00			16.00	30.00	304.15	251.84		58.40	109.49	7.55	72.00
4/9/2018		85.00			17.00	36.00	317.75	247.85		64.82	137.27	7.34	75.00
4/10/2018		63.00		130.00	17.00	14.00	303.84	229.70	473.99	61.98	51.05	7.20	75.00
4/11/2018		59.00			24.00	21.00	293.18	207.57		84.44	73.88	7.23	77.00
4/12/2018		58.00			26.00	20.00	304.42	215.53		94.98	73.06	7.21	77.00
4/13/2018							304.48					7.22	73.00
4/14/2018							304.54					7.25	75.00
4/15/2018		58.00			31.00	18.00	311.71	216.95		115.96	67.33	7.23	73.00
4/16/2018	140.00	14.00	270.00	80.00	26.00	10.00	321.93	231.79		100.44	38.63	7.35	70.00
4/17/2018		57.00		110.00	22.00	19.00	320.82	219.44	423.48	84.70	73.15	6.85	70.00
4/18/2018		56.00			22.00	8.00	312.32	209.88		82.45	29.98	7.49	70.00
4/19/2018		55.00			24.00	27.00	317.54	209.58		91.45	102.88	7.42	70.00
4/20/2018							322.07					7.35	74.00
4/21/2018							322.02					7.10	74.00
4/22/2018		57.00			24.00	12.00	315.20	215.60		90.78	45.39	7.22	75.00
4/23/2018		65.00			19.00	20.00	312.42	243.69		71.23	74.98	7.25	73.00
4/24/2018		70.00		130.00	14.00	24.00	320.43	269.16	499.87	53.83	92.28	7.33	73.00
4/25/2018	54.00				16.00	22.00	320.43	296.08		61.52	64.59	7.50	76.00
4/26/2018		84.00			20.00	26.00	320.43	322.99		76.90	99.97	7.53	80.00

4/27/2018						320.43				7.84	77.00	
4/28/2018						320.43				7.48	77.00	
4/29/2018		84.00		29.00	34.00	304.54	306.88	105.98	124.25	7.54	77.00	
4/30/2018		73.00		34.00	24.00	360.39	315.70	147.04	103.79	7.53	75.00	
5/1/2018		70.00	130.00	35.00	27.00	395.81	332.46	617.46	166.24	128.24	7.50	77.00
5/2/2018		61.00		23.00	36.00	385.57	282.24		106.42	166.57	7.35	77.00
5/3/2018		55.00		21.00	46.00	409.43	270.22		103.18	235.83	7.25	76.00
5/4/2018						401.16					7.38	77.00
5/5/2018						384.18					7.41	79.00
5/6/2018	3.70	90.00	47.00	18.00	20.00	384.07	216.62		82.96	92.18	7.56	76.00
5/7/2018		45.00		21.00	15.00	414.64	223.91		104.49	74.64	7.55	79.00
5/8/2018		45.00	91.00	14.00	19.00	415.12	224.16	453.31	69.74	94.65	7.51	80.00
5/9/2018		55.00		13.00	17.00	383.84	253.33		59.66	78.30	7.39	80.00
5/10/2018		60.00		15.00	9.60	377.98	272.15		68.04	43.54	7.37	80.00
5/11/2018						403.99					7.26	75.00
5/12/2018						370.84					7.30	75.00
5/13/2018		66.00		9.90	6.80	372.25	294.82		44.22	30.38	7.74	74.00
5/14/2018		65.00		9.30	4.00	382.80	298.58		42.72	18.37	7.40	76.00
5/15/2018		71.00	86.00	6.10	4.00	370.50	315.67	382.36	27.12	17.78	7.30	78.00
5/16/2018		67.00		5.50	8.00	403.67	324.55		28.64	38.75	7.46	78.00
5/17/2018		70.00		5.50	7.20	394.65	331.61		26.05	34.10	7.38	79.00
5/18/2018						368.23					7.46	79.00
5/19/2018						411.93					6.83	81.00
5/20/2018		80.00		4.00	11.00	393.37	377.64		18.88	51.92	7.63	82.00
5/21/2018		86.00		4.00	7.60	406.56	419.57		19.51	37.08	7.37	78.00
5/22/2018		82.00	92.00	4.00	7.20	412.02	405.43	454.87	19.78	35.60	7.56	76.00
5/23/2018		77.00		4.00	8.80	407.13	376.19		19.54	42.99	7.44	80.00
5/24/2018		79.00		5.80	9.20	381.43	361.60		26.55	42.11	7.68	80.00
5/25/2018						407.31					7.36	83.00
5/26/2018						406.31					7.46	82.00

5/27/2018			80.00			7.10	14.00	402.64	386.53		34.30	67.64	7.53	83.00
5/28/2018			87.00			11.00	12.00	401.29	418.95		52.97	57.79	7.56	84.00
5/29/2018			92.00		92.00	6.80	9.60	397.08	438.38	438.38	32.40	45.74	7.56	84.00
5/30/2018			92.00			6.40	19.00	407.98	450.41		31.33	93.02	7.66	83.00
5/31/2018			90.00			5.80	10.00	405.14	437.55		28.20	48.62	8.01	86.00
6/1/2018								439.69					7.71	84.00
6/2/2018								383.21					7.70	80.00
6/3/2018			92.00			4.00	6.00	394.40	435.42		18.93	28.40	7.50	80.00
6/4/2018	4.20	1.00	60,000.00	86.00		5.70	5.60	399.00	411.77		27.29	26.81	7.40	82.00
6/5/2018			90.00		96.00	6.10	7.60	390.65	421.90	450.03	28.60	35.63	7.77	82.00
6/6/2018			87.00			6.00	6.40	388.33	405.42		27.96	29.82	7.45	82.00
6/7/2018			60,000.00	87.00		13.00	16.00	398.35	415.88		62.14	76.48	7.63	84.00
6/8/2018								395.19					7.49	82.00
6/9/2018								474.88					7.56	78.00
6/10/2018			80.00			13.00	15.00	440.10	422.50		68.66	79.22	7.60	79.00
6/11/2018			79.00			8.00	10.00	439.92	417.04		42.23	52.79	7.81	81.00
6/12/2018			83.00		98.00	7.30	8.80	447.12	445.33	525.81	39.17	47.22	7.66	80.00
6/13/2018			87.00			8.10	13.00	417.13	435.48		40.55	65.07	7.57	80.00
6/14/2018			60,000.00	87.00		13.00	15.00	414.97	433.23		64.74	74.69	7.66	80.00
6/15/2018								439.69					7.59	80.00
6/16/2018								422.67					7.51	82.00
6/17/2018			60.00			28.00	19.00	428.25	308.34		143.89	97.64	7.76	85.00
6/18/2018			55.00			62.00	25.00	419.08	276.59		311.80	125.72	7.61	84.00
6/19/2018			4,800.00	50.00	130.00	66.00	24.00	353.08	211.85	550.80	279.64	101.69	7.67	82.00
6/20/2018			800.00	54.00		63.00	14.00	359.58	233.01		271.84	60.41	7.55	80.00
6/21/2018			58.00			51.00	25.00	408.31	284.18		249.89	122.49	7.54	82.00
6/22/2018			58.00					397.66	276.77				7.60	83.00
6/23/2018								408.38					7.54	85.00
6/24/2018			59.00			15.00	13.00	402.93	285.27		72.53	62.86	7.51	84.00
6/25/2018			61.00			41.00	4.80	379.62	277.88		186.77	21.87	7.57	78.00

6/26/2018		1,500.00	68.00		76.00	16.00	11.00	366.24	298.85	334.01	70.32	48.34	7.57	82.00
6/27/2018			75.00			7.10	4.40	357.72	321.95		30.46	18.89	8.06	86.00
6/28/2018			94.00			11.00	11.00	365.08	411.81		48.19	48.19	8.05	86.00
6/29/2018								375.60					8.03	86.00
6/30/2018								369.44					7.66	86.00
7/1/2018			84.00			18.00	8.40	373.83	376.82		80.75	37.68	7.69	86.00
7/2/2018	3.60	60,000.00	78.00			28.00	12.00	384.06	359.48		129.04	55.30	7.76	88.00
7/3/2018			87.00		91.00	11.00	8.00	387.76	404.82	423.43	51.18	37.22	7.60	88.00
7/4/2018			91.00			6.40	14.00	389.90	425.77		29.94	65.50	7.63	86.00
7/5/2018		60,000.00	83.00			19.00	24.00	388.89	387.33		88.67	112.00	7.74	86.00
7/6/2018								389.49					7.67	90.00
7/7/2018								378.64					7.66	90.00
7/8/2018			96.00			8.90	19.00	388.14	447.14		41.45	88.50	7.53	88.00
7/9/2018			93.00			19.00	11.00	385.90	430.66		87.99	50.94	7.51	82.00
7/10/2018		60,000.00	96.00		99.00	11.00	10.00	376.67	433.92	447.48	49.72	45.20	7.47	82.00
7/11/2018			98.00			7.20	10.00	373.41	439.13		32.26	44.81	7.81	84.00
7/12/2018			100.00			9.60	15.00	397.57	477.08		45.80	71.56	7.76	84.00
7/13/2018								393.23					7.68	84.00
7/14/2018								398.67					7.67	88.00
7/15/2018			100.00			7.90	4.00	394.61	473.53		37.41	18.94	7.67	88.00
7/16/2018			97.00			9.10	5.20	393.40	457.92		42.96	24.55	8.10	90.00
7/17/2018			93.00		85.00	7.50	4.00	400.17	446.59	408.17	36.02	19.21	7.59	88.00
7/18/2018		60,000.00	89.00			6.50	5.20	378.07	403.78		29.49	23.59	7.58	86.00
7/19/2018			87.00			4.00	16.00	398.56	416.10		19.13	76.52	7.60	86.00
7/20/2018								393.57					7.59	85.00
7/21/2018								385.19					7.53	86.00
7/22/2018			86.00			7.60	14.00	373.54	385.49		34.07	62.75	7.59	86.00
7/23/2018			76.00			18.00	20.00	370.09	337.52		79.94	88.82	7.37	86.00
7/24/2018			75.00		95.00	26.00	7.20	371.79	334.61	423.84	116.00	32.12	7.48	86.00
7/25/2018			72.00			22.00	13.00	368.91	318.74		97.39	57.55	7.42	84.00

7/26/2018		74.00			5.00	15.00	365.84	324.87		21.95	65.85	7.43	88.00
7/27/2018							378.71					7.61	80.00
7/28/2018							377.36					7.80	80.00
7/29/2018		81.00			4.00	18.00	353.07	343.18		16.95	76.26	7.56	82.00
7/30/2018		88.00			6.80	20.00	377.81	398.97		30.83	90.67	7.56	88.00
7/31/2018		84.00		110.00	12.00	8.00	370.56	373.52	489.14	53.36	35.57	7.55	86.00
8/1/2018		2,700.00	86.00		8.50	9.20	362.87	374.48		37.01	40.06	7.46	86.00
8/2/2018		81.00			5.60	29.00	369.36	359.02		24.82	128.54	7.50	84.00
8/3/2018							369.67					7.43	82.00
8/4/2018							360.32					7.48	80.00
8/5/2018		75.00			9.40	12.00	359.36	323.42		40.54	51.75	7.87	80.00
8/6/2018	0.80	3,400.00	79.00		9.70	17.00	356.56	338.02		41.50	72.74	7.95	82.00
8/7/2018		84.00		87.00	4.60	10.00	371.10	374.07	387.43	20.48	44.53	7.42	82.00
8/8/2018		91.00			4.60	11.00	427.99	467.37		23.63	56.49	7.98	82.00
8/9/2018		89.00			4.30	14.00	417.49	445.88		21.54	70.14	8.05	80.00
8/10/2018						14.00	414.28				69.60	7.99	84.00
8/11/2018												7.23	86.00
8/12/2018		74.00			4.00	5.60	363.99	323.22		17.47	24.46	7.54	86.00
8/13/2018		73.00			4.00	9.20	371.39	325.34		17.83	41.00	8.02	89.00
8/14/2018		60,000.00	75.00		88.00	4.00	366.70	330.03	387.24	17.60	17.60	7.95	82.00
8/15/2018		77.00			6.60	7.20	366.39	338.54		29.02	31.66	7.34	86.00
8/16/2018		80.00			4.30	7.60	361.00	348.56		18.63	32.92	7.42	84.00
8/17/2018							390.99					7.51	88.00
8/18/2018							388.01					7.51	86.00
8/19/2018		93.00			4.00	8.40	400.53	446.99		19.23	40.37	7.50	86.00
8/20/2018													
8/21/2018													
8/22/2018													
8/23/2018		60,000.00	100.00		7.50	6.80	333.16	399.79		29.98	27.19		
8/24/2018							334.98					8.05	78.00

8/25/2018						336.42				8.04	80.00		
8/26/2018		55.00		4.40	4.00	341.17	225.17		18.01	16.38	7.22	80.00	
8/27/2018		50.00		4.00	4.80	372.83	223.70		17.90	21.48	7.46	82.00	
8/28/2018		49.00		58.00	4.00	4.00	398.85	234.52	277.60	19.14	19.14	7.48	82.00
8/29/2018		430.00	58.00		4.00	4.00	395.98	275.80		19.01	19.01	7.46	82.00
8/30/2018		60.00			4.50	4.00	410.59	295.62		22.17	19.71	7.58	79.00
8/31/2018							391.32					7.59	80.00
9/1/2018							388.25					7.50	79.00
9/2/2018		74.00		81.00	4.00	4.80	384.39	341.34	373.63	18.45	22.14	7.40	81.00
9/3/2018	0.80	0.80	1,700.00		4.00	7.60	405.45	374.64		19.46	36.98	7.42	80.00
9/4/2018		82.00		89.00	6.00	12.00	409.42	402.87	437.26	29.48	58.96	7.95	80.00
9/5/2018		80.00			9.50	16.00	411.17	394.72		46.87	78.94	7.40	80.00
9/6/2018		76.00			4.00	11.00	413.27	376.90		19.84	54.55	7.43	80.00
9/7/2018							432.34					8.07	81.00
9/8/2018							431.25					8.05	77.00
9/9/2018		79.00			4.00	13.00	438.22	415.43		21.03	68.36	7.94	75.00
9/10/2018		87.00			4.00	10.00	432.68	451.72		20.77	51.92	8.01	79.00
9/11/2018		1,600.00	87.00	94.00	4.50	8.80	420.33	438.82	474.13	22.70	34.30	7.96	76.00
9/12/2018		88.00			6.10	8.40	392.42	414.40		28.73	39.56	7.34	82.00
9/13/2018		87.00			9.20	16.00	398.07	415.59		43.95	76.43	7.41	82.00
9/14/2018							393.41					7.36	84.00
9/15/2018							401.50					7.25	84.00
9/16/2018		79.00			12.00	30.00	410.72	389.36		59.14	147.86	7.51	84.00
9/17/2018		83.00		2,368	14.00	35.00	406.78	405.15		68.34	170.85	7.20	82.00
9/18/2018		86.00		100.00	11.00	28.00	396.88	409.58	476.26	52.39	133.35	7.22	86.00
9/19/2018		94.00			10.00	35.00	396.14	446.85		47.54	166.38	8.02	82.00
9/20/2018		100.00			10.00	33.00	388.21	465.85		46.59	153.73	8.12	86.00
9/21/2018							387.27					8.06	84.00
9/22/2018							396.10					7.60	74.00
9/23/2018		110.00			10.00	71.00	355.82	469.66		42.70	303.16	7.62	76.00

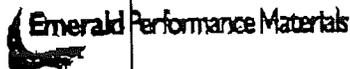
9/24/2018		10.00	110.00		8.20	68.00	345.22	455.69		33.97	281.70	7.02	80.00
9/25/2018			110.00	130.00	11.00	78.00	348.94	460.60	544.35	46.06	326.61	7.30	82.00
9/26/2018		10.00	110.00		6.60	82.00	418.47	552.36		43.19	411.77	7.24	80.00
9/27/2018			100.00		11.00	94.00	430.28	516.34		56.80	485.36	7.23	83.00
9/28/2018							427.93					7.12	78.00
9/29/2018							421.92					7.26	70.00
9/30/2018			83.00		13.00	91.00	404.23	431.72		63.06	441.42	7.62	74.00
10/1/2018			91.00		10.00	52.00	389.76	425.62		46.77	243.21	7.89	74.00
10/2/2018			98.00	98.00	5.70	25.00	410.51	482.76	482.76	28.08	123.15	7.33	78.00
10/3/2018			91.00		8.20	19.00	390.79	426.74		38.45	89.10	7.28	78.00
10/4/2018			100.00		5.90	14.00	414.68	497.62		29.36	69.67	7.45	78.00
10/5/2018							412.82					7.88	75.00
10/6/2018							413.71					7.35	80.00
10/7/2018			86.00		11.00	37.00	427.29	440.96		56.40	189.72	7.45	81.00
10/8/2018	0.80	2,300.00	79.00		14.00	26.00	431.01	408.60		72.41	134.48	8.01	78.00
10/9/2018			70.00		7.20	30.00	425.13	357.11		36.73	153.05	7.89	76.00
10/10/2018			73.00	81.00	7.50	47.00	440.14	385.56	427.82	39.61	248.24	7.36	80.00
10/11/2018			74.00		17.00	23.00	454.20	403.33		92.66	125.36	7.40	74.00
10/12/2018							432.24					7.24	75.00
10/13/2018							391.77					7.03	73.00
10/14/2018			110.00		8.60	32.00	419.21	553.36		43.26	160.98	7.27	74.00
10/15/2018			81.00		10.00	24.00	424.72	412.83		50.97	122.32	7.30	74.00
10/16/2018			89.00		7.40	17.00	419.12	447.62		37.22	85.50	7.40	75.00
10/17/2018			94.00	100.00	6.50	22.00	130.93	147.69	157.12	10.21	34.57	7.96	75.00
10/18/2018		10.00	87.00		6.10	22.00	419.51	437.97		30.71	110.75	8.04	74.00
10/19/2018		10.00					441.97					7.70	70.00
10/20/2018							395.07						
10/21/2018			70.00		4.00	20.00	394.67	331.52		18.94	94.72	7.00	68.00
10/22/2018		10.00	68.00		5.70	23.00	421.13	343.64		28.81	116.23	7.25	70.00
10/23/2018			71.00	91.00	8.00	20.00	422.80	360.23	461.70	40.59	101.47	7.21	72.00

10/24/2018		72.00			5.90	26.00	419.28	362.25		29.69	130.82	7.26	73.00
10/25/2018		72.00			7.20	27.00	403.09	348.27		34.83	130.60	7.17	73.00
10/26/2018							378.66						
10/27/2018							412.54					7.43	68.00
10/28/2018	6,000.00	76.00			10.00	23.00	419.92	382.97		50.39	115.90	7.32	69.00
10/29/2018		78.00			9.60	20.00	426.35	399.06		49.12	102.32	7.34	70.00
10/30/2018	2,700.00	75.00			7.60	18.00	424.46	382.01		38.71	91.68	7.37	70.00
10/31/2018		83.00		92.00	9.20	19.00	434.98	433.24	480.22	46.02	99.18	7.20	60.00
11/1/2018		78.00			4.00	8.80	405.92	379.94		19.48	42.87	7.87	70.00
11/2/2018							441.99					7.14	79.00
11/3/2018							425.48					6.82	73.00
11/4/2018		69.00			6.20	43.00	402.82	333.53		29.97	207.86	7.06	70.00
11/5/2018	0.60	10.00	66.00		7.30	49.00	374.33	296.47		32.79	220.11	7.30	70.00
11/6/2018		10.00	67.00	84.00	10.00	58.00	375.99	302.30	379.00	45.12	261.69	7.40	69.00
11/7/2018		72.00			9.10	82.00	381.55	329.66		41.67	375.45	7.30	73.00
11/8/2018		79.00			19.00	76.00	370.88	351.59		84.56	347.14	7.13	72.00
11/9/2018							360.41					7.32	72.00
11/10/2018							369.55					6.90	70.00
11/11/2018		97.00			6.60	28.00	376.48	438.22		29.82	126.50	7.42	73.00
11/12/2018		94.00			8.30	46.00	398.05	449.00		39.65	219.72	7.23	77.00
11/13/2018		100.00			21.00	35.00	373.66	448.39		94.16	156.94	7.32	74.00
11/14/2018		110.00		100.00	41.00	39.00	377.90	498.83	453.48	185.93	176.86	7.90	74.00
11/15/2018		96.00			34.00	45.00	349.67	403.05		142.75	188.93	7.84	75.00
11/16/2018							338.55					7.38	69.00
11/17/2018							258.28					8.02	70.00
11/18/2018		88.00			13.00	14.00	315.55	333.22		49.23	53.01	7.57	70.00
11/19/2018		79.00			10.00	18.00	401.60	380.72		48.19	86.75	7.36	70.00
11/20/2018		73.00		95.00	11.00	12.00	341.71	299.34	389.55	45.11	49.21	6.80	68.00
11/21/2018		77.00			5.20	8.80	362.73	335.16		22.63	38.30	7.32	71.00
11/22/2018		74.00			4.00	8.40	333.25	295.93		16.00	33.59	7.31	71.00

11/23/2018						267.53				7.41	71.00		
11/24/2018						320.34				7.55	77.00		
11/25/2018			68.00		6.60	10.00	268.87	219.40	21.29	32.26	7.45	75.00	
11/26/2018			66.00		4.00	4.00	385.64	305.43	18.51	18.51	7.57	69.00	
11/27/2018			68.00	80.00	4.00	6.00	389.87	318.13	374.28	18.71	28.07	7.34	68.00
11/28/2018			74.00		4.00	4.00	405.46	360.05	19.46	19.46	7.41	69.00	
11/29/2018			74.00		4.00	16.00	356.08	316.20	17.09	68.37	7.37	69.00	
11/30/2018						384.37					6.98	72.00	
12/1/2018						412.48					7.50	72.00	
12/2/2018			69.00		4.20	14.00	432.96	358.49	21.82	72.74	7.39	75.00	
12/3/2018	2.10	3.10	10.00		4.00	6.80	408.92	314.05	19.63	33.37	7.84	74.00	
12/4/2018			67.00	74.00	4.00	5.60	368.65	296.39	327.36	17.70	24.77	7.66	70.00
12/5/2018			71.00		4.00	4.00	358.53	305.47	17.21	17.21	7.19	68.00	
12/6/2018			68.00		5.30	4.00	395.43	322.67	25.15	18.98	8.02	73.00	
12/7/2018						363.51					6.80	70.00	
12/8/2018						335.69					7.40	70.00	
12/9/2018			75.00		4.00	4.00	329.88	296.89	15.83	15.83	7.40	66.00	
12/10/2018			83.00		4.00	4.00	332.02	330.69	15.94	15.94	7.49	70.00	
12/11/2018			92.00	91.00	4.00	4.00	330.61	364.99	361.03	15.87	15.87	6.99	77.00
12/12/2018			93.00		4.00	4.00	325.02	362.72	15.60	15.60	7.61	79.00	
12/13/2018			82.00		4.00	6.40	327.25	322.01	15.71	25.13	7.46	77.00	
12/14/2018						318.55					7.47	70.00	
12/15/2018						319.02					7.36	70.00	
12/16/2018			75.00		4.00	4.00	310.26	279.23	14.89	14.89	7.27	68.00	
12/17/2018			10.00		4.60	4.00	344.52	314.20	19.02	16.54	7.20	73.00	
12/18/2018			79.00	80.00	4.20	4.00	334.04	316.67	320.68	16.84	16.03	7.40	73.00
12/19/2018			75.00		4.00	4.00	331.20	298.08	15.90	15.90	7.36	73.00	
12/20/2018			73.00		4.00	4.00	334.40	292.93	16.05	16.05	7.46	71.00	
12/21/2018						334.32					7.48	72.00	
12/22/2018						341.55					7.26	71.00	

12/23/2018					66.00				4.00	4.00	338.78	268.31		16.26	16.26	7.20	72.00	
12/24/2018					74.00				4.00	4.00	296.00	262.85		14.21	14.21	7.31	70.00	
12/25/2018					74.00		78.00		4.00	6.80	306.47	272.15	286.86	14.71	25.01	7.89	69.00	
12/26/2018					74.00				4.70	4.00	273.67	243.02		15.43	13.14	7.99	70.00	
12/27/2018					75.00				4.20	5.20	243.86	219.47		12.29	15.22	8.07	66.00	
12/28/2018											321.24					7.97	72.00	
12/29/2018											296.31					7.32	76.00	
12/30/2018					69.00				4.80	10.00	360.09	298.15		20.74	43.21	7.36	68.00	
12/31/2018					71.00		80.00		5.90	20.00	284.83	242.68	273.44	20.17	68.36	7.34	71.00	
<b>Avg</b>	18.486	4.417	5.000	5.000	*****	79.696	10.000	2.368	95.811	10.325	19.554	359.660	343.707	406.637	44.756	84.447	7.492	76.262
<b>Min</b>	0.800	0.800	5.000	5.000	10.000	45.000	10.000	2.368	58.000	4.000	4.000	130.930	134.917	157.116	8.177	13.136	6.800	60.000
<b>Max</b>	140.000	14.000	5.000	5.000	*****	120.000	10.000	2.368	150.000	66.000	94.000	474.880	553.357	617.464	311.796	485.356	8.120	90.000
<b>Sum</b>												*****						
<b>30-Day AVG/</b>	40/	21/							10/	25/	636.81			183.5/	229.3/	6/		
<b>Daily MAX</b>	89	46			499	155			40	50	1848.6			477	596.3	9		

# **EXHIBIT 5**



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

**CERTIFIED MAIL:**

Illinois EPA  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

**CERTIFIED MAIL:**

Mr. Jim Kammerer  
IEPA  
Regional Office  
5415 N. University  
Peoria, IL 61614

Re: NPDES Annual Summary Report - NPDES Permit No. IL0001392

12/24/07

Dear Sirs:

Emerald Performance Materials is submitting its 2007 NPDES Annual Summary Report as was required by the PCB Order of AS 02-5 and now by its NPDES permit.

1. The IEPA issued Emerald Performance Material's its Final NPDES Permit on February 9, 2007 to be effective May 1, 2007 which included the conditions outlined in the PCB Order of AS 02-5.
2. The Henry Plant continues to use the 21 foot high-rate, multi-port diffuser that was installed on 10/4/05 into the Illinois River. Quarterly samples of the Illinois River for Ammonia Nitrogen are listed below:
  - a. 3/28/07: 0.23 mg/l
  - b. 9/28/07: 0.20 mg/l
  - c. 12/21/07: Results pending analysis
3. Monthly DMR's have been submitted to the IEPA throughout the year with ammonia monitoring results conducted 5 times per week.
4. An annual inspection of the facility was completed on September 11, 2007 by James Kammerer. Diffuser installation was reviewed along with the plant's Waste Treatment Access Database system.
5. The plant participated in the Pollution Prevention Program in 2007 by supporting a P2 Intern.
6. One major project that was completed during the year was the removal of the BBTS scrubber which was replaced with a dust collector. This improved overall process efficiencies by preventing loss of finished BBTS product to the waste water.
7. Key projects that the plant continued to work on during 2007 which have the potential to reduce ammonia generation at the waste treatment system include the following:
  - a. Investigation of a sintered filter media for the BHS filters that would not be prone to tearing and loss of BBTS product to the waste water.
  - b. Continued efforts to improve acetonitrile column efficiency to meet the Miscellaneous Organic NESHAP's (MON) standard.

- c. Investigation of a new process in the Netherlands called the Anammox (anaerobic ammonia oxidation) process. This is a relatively new method of treating high concentrations of ammonia anaerobically. The first commercial process was installed 2002 and was featured in the January 2007 issue of Chemical Engineering. Based on Brown and Caldwell Environmental Consultants, the bacteria cultured in this system are very slow growing and sensitive. The inhibitors in the Emerald waste stream would render the process performance unstable.

In the event additional information is needed, please contact me either by phone (309)364-9411 or by email [dave.giffin@emeraldmaterials.com](mailto:dave.giffin@emeraldmaterials.com).

Sincerely,

David E. Giffin  
HSE Manager

cc: Emerald: Jeff Branner, Brian Denison  
IERA: James Kammweller, Region Office.



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

Illinois EPA  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

Re: NPDES Annual Summary Report - NPDES Permit No. IL0001392

05/20/2010

Dear Sirs:

Emerald Performance Materials is submitting its 2008 NPDES Annual Summary Report as was required by its NPDES permit.

1. The IEPA issued Emerald Performance Material's its Final NPDES Permit on February 9, 2007 to be effective May 1, 2007 which included the conditions outlined in the PCB Order of AS 02-5.
2. The Henry Plant continues to use the 21 foot high-rate, multi-port diffuser that was installed on 10/4/05 into the Illinois River. Quarterly samples of the Illinois River for Ammonia Nitrogen are listed below:
  - a. 3/14/08: 0.27 mg/l
  - b. 6/19/08 <0.10 mg/l
  - c. 9/28/08: <0.20 mg/l
  - d. 12/13/08 <0.20 mg/l
3. Monthly DMR's have been submitted to the IEPA throughout the year with ammonia monitoring results conducted 5 times per week.
4. An annual inspection of the facility was completed on September 29, 2008 by James Kammseller.
5. Key projects that the plant continued to work on during 2008 which have the potential to reduce ammonia generation at the waste treatment system include the following:
  - a. Brown and Caldwell conducted training in August with waste water treatment operators to optimize the WWT system.
  - b. Initiated study on the effects of Carbon Dioxide for ph buffering.
  - c. Conducted Fed Batch Reactor testing to quantify any bio-inhibitions present in the system.

In the event additional information is needed, please contact me either by phone (309)364-9411 or by email [mike.strabley@emeraldmaterials.com](mailto:mike.strabley@emeraldmaterials.com)

Sincerely,

Mike Strabley  
HSE Manager

cc: Emerald: Jeff Leech, Brian Denison



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

CERTIFIED MAIL:  
Illinois EPA  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

CERTIFIED MAIL:  
Mr. Jim Kammeller  
IEPA  
Regional Office  
5415 N. University  
Peoria, IL 61614

Re: NPDES Annual Summary Report - NPDES Permit No. IL0001392

12/22/09

Dear Sirs:

Emerald Performance Materials is submitting its 2009 NPDES Annual Summary Report as was required by its NPDES permit.

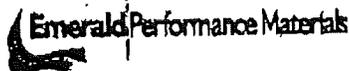
1. The IEPA issued Emerald Performance Material's its Final NPDES Permit on February 9, 2007 to be effective May 1, 2007 which included the conditions outlined in the PCB Order of AS 02-5.
2. The Henry Plant continues to use the 21 foot high-rate, multi-port diffuser that was installed on 10/4/05 into the Illinois River. Quarterly samples of the Illinois River for Ammonia Nitrogen are listed below:
  - a. 3/26/09: <0.20 mg/l
  - b. 6/18/09 <0.20 mg/l
  - c. 9/28/09: <0.10 mg/l
  - d. 11/20/09 < 0.20 mg/l
3. Monthly DMR's have been submitted to the IEPA throughout the year with ammonia monitoring results conducted 5 times per week.
4. An annual inspection of the facility was completed on September 22, 2009 by James Kammeller.
5. Key projects that the plant continued to work on during 2009 which have the potential to reduce ammonia generation at the waste treatment system include the following:
  - a. Improvements to the Tertiary Butyl Amine column increasing the recovery of TBA resulting in less amine to the sewer.
  - b. Utilization of carbon dioxide for pH adjustment reducing overall loading on the biotreaters. The use of CO<sub>2</sub> reduces the slug feeding of caustic to the system at the primary clarifier adding stability throughout the system.

In the event additional information is needed, please contact me either by phone (309)364-9411 or by email [mike.strahley@emeraldmaterials.com](mailto:mike.strahley@emeraldmaterials.com)

Sincerely,

Mike Strabley  
HSE Manager

cc: Emerald: Jeff Bremner, Brian Denison  
IEPA: James Kazimuller, Region Office.



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

CERTIFIED MAIL:  
Illinois EPA  
Division of Water Pollution Control  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

CERTIFIED MAIL:  
Mr. Todd Hyson  
IEPA-Regional Office  
5415 N. University  
Peoria, IL 61614

Re: NPDES Annual Summary Report - NPDES Permit No. IL0001392

1/14/10

Dear Sirs:

Emerald Performance Materials is submitting its 2010 NPDES Annual Summary Report as was required by its NPDES permit.

1. The IEPA issued Emerald Performance Material's its Final NPDES Permit on February 9, 2007 to be effective May 1, 2007 which included the conditions outlined in the PCB Order of AS 02-5.
2. NPDES permit was modified on April 27, 2010 listing PolyOne Corporation as a co-permittee.
3. The Henry Plant continues to use the 21 foot high-rate, multi-port diffuser that was installed on 10/4/05 into the Illinois River. Quarterly samples of the Illinois River for Ammonia Nitrogen are listed below:
  - a. 3/31/10: <0.20 mg/l
  - b. 6/30/10 <0.20 mg/l
  - c. 9/23/10: <0.20 mg/l
  - d. Unable to sample in December due to the amount of ice on the river.
4. Monthly DMR's have been submitted to the IEPA throughout the year with ammonia monitoring results conducted 5 times per week.
5. An annual inspection of the facility was completed on September 23, 2010 by James Karmueller.
6. Key projects that the plant continued to work on during 2010 which have the potential to reduce ammonia generation at the waste treatment system include the following:
  - a. Incorporate ammonia reduction as a metric in the employee gain sharing plan.
  - b. Conduct additional testing to further determine sources of ammonia within the facility.

In the event additional information is needed, please contact me either by phone (309)364-9411 or by email [mike.strabley@emeraldmaterials.com](mailto:mike.strabley@emeraldmaterials.com)

Sincerely,

Mike Strabley  
HSE Manager

cc: Emerald: Jeff Leach, Brian Driscoll, John McKinley

EPA: James Kammeller, Region Office.



CERTIFIED MAIL: 7010 3090 0003 0728 0105

December 20, 2011

Illinois Environmental Protection Agency  
P. O. Box 19276  
Springfield IL 62794-9276

Attn: Division of Water Pollution Control  
Compliance Assurance Section, Mail Code #19

Re: NPDES Permit No. IL0001392 – Annual Ammonia Report

Gentlemen:

Special Condition 17 of NPDES permit No. IL0001392, requires that Emerald Performance Materials' Henry IL facility submit an annual report summarizing the activities and results of investigations required by Special Conditions 15, 16 and 18 of the permit.

Special Condition 15 requires Emerald to investigate production methods and technologies which reduce ammonia concentration in effluent from the facility's Waste Water Treatment Plant (WWTP). One source of ammonia to the WWTP is the bottoms stream from the acetonitrile recovery column in the 3114 process. It has been determined that the recovery efficiency of the column is sensitive to absolute pressure at the bottom of the column. A project was defined during the fourth quarter of 2011 to upgrade the instrumentation around the column in order to more effectively control absolute pressure. These upgrades will be implemented in 2012.

Special Condition 16 requires that Emerald evaluate any new technology or economically reasonable production methods which may reduce ammonia concentration in effluent from the WWTP. Emerald did not become aware in 2011 of any new or alternative technology that can be integrated into the facility's manufacturing processes or economically replace existing processes.

Special Condition 18 requires that Emerald quarterly monitor ammonia concentration in the Illinois River in order to demonstrate compliance with 35 IAC 302.212 and that Emerald report those results in the annual report. The results of those samples are shown below.

Sample Date.....	Concentration
31 March 2011 .....	< 0.10 mg/L
30 June 2011 .....	< 0.10 mg/L
23 September 2011 .....	< 0.10 mg/L
15 December 2011 .....	< 0.10 mg/L

If you have any questions, please e-mail me at [harold.crouch@emeraldmaterials.com](mailto:harold.crouch@emeraldmaterials.com) or call me at 309-364-9472.

A handwritten signature in dark ink, appearing to read "Harold Crouch".

Harold Crouch, P.E.  
Environmental Engineer

Emerald Polymer Additives, LLC

1550 County Road 1450 N. / Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)

Date

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

CERTIFIED MAIL: nnnn nnnn nnnn nnnn nnnn

**Re: NPDES Permit No. IL0001392 – Annual Ammonia Report**

Gentlemen:

**Special Condition 17** of NPDES Permit No. IL0001392 requires that Emerald Performance Materials' Henry IL facility submit an annual report summarizing the activities and results of investigations required by Special Conditions 15, 16 and 18 of the Permit.

**Special Condition 15** requires that Emerald "investigate production methods and technologies that generate less ammonia in the Permittee's discharge into the Illinois River."

As identified in the annual report in 2011, one source of ammonia to the WWTP is the bottoms stream from the acetonitrile recovery column in the 3114 process. It has been determined that the recovery efficiency of the column is sensitive to absolute pressure at the bottom of the column. A project was defined during the fourth quarter of 2011 to upgrade the instrumentation around the column in order to more effectively control absolute pressure. These upgrades were implemented in 2012.

In the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to WWTP to help set priorities for other projects to be undertaken to look for or implement ammonia reduction to our plant effluent. Analyses of the results are still pending review.

On 28 September 2012, Emerald filed with the Illinois Pollution Control Board a petition for renewal of the adjusted ammonia standard granted by the Board on 4 November 2004. A copy of this petition was submitted to IEPA. This filing included a report by Brown & Caldwell Consulting Engineers of all known methods of reducing ammonia concentration in Emerald treated effluent, along with economic analyses of each option. The report concluded that while there were several technically feasible treatment methods, none of them were economically feasible.

**Special Condition 16** states that "The permittee must 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 from the Permittee's facility which the Agency specifically requests in writing that they do." No such request was issued by IEPA in 2012.

**Special Condition 18** requires that "Emerald monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 IAC 302.202. The results of those analyses are shown below.

Sample Date	Concentration
28 March 2012.....	< 0.10 mg/L
22 June 2012.....	< 0.10 mg/L
28 September 2012 .....	1.1 mg/L
16 November 2012 .....	< 0.10 mg/L

If you have any questions, please contact me at [Kellie.Staab@EmeraldMaterials.com](mailto:Kellie.Staab@EmeraldMaterials.com) or call me at 309-364-9411.

Kellie J. Staab, HSE Manager



December 30, 2013

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

CERTIFIED MAIL: 7010 3090 0003 0728 1317

**Re: NPDES Permit No. IL0001392 – Annual Ammonia Report**

Gentlemen:

**Special Condition 17** of NPDES Permit No. IL0001392 requires that Emerald Performance Materials' Henry IL facility submit an annual report summarizing the activities and results of investigations required by Special Conditions 15, 16 and 18 of the Permit.

**Special Condition 15** requires that Emerald "investigate production methods and technologies that generate less ammonia in the Permittee's discharge into the Illinois River."

As identified in the annual report in 2011, one source of ammonia to the WWTP is the bottoms stream from the acetonitrile recovery column in the 3114 process. It has been determined that the recovery efficiency of the column is sensitive to absolute pressure at the bottom of the column. A project was defined during the fourth quarter of 2011 to upgrade the instrumentation around the column in order to more effectively control absolute pressure. These upgrades were implemented in 2012. Unfortunately, the process did not run enough in 2013 to get representative numbers of any direct contribution these upgrades made. However, the overall pounds of ammonia to the river for 2013 were approximately 13,000 pounds less than in 2012.

In the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to WWTP to help set priorities for other projects to be undertaken to look for or implement ammonia reduction to our plant effluent. Review of the analyses results show that one product from Building 725 was a major contributor. The process uses an excess of t-butylamine. Efforts were started to identify the true excess needed to produce quality product. Efforts will continue in 2014 to attempt to further reduce this excess which leaves the process and goes to wastewater treatment either by direct source reduction or better recovery of the t-butylamine.

On 28 September 2012, Emerald filed with the Illinois Pollution Control Board a petition for renewal of the adjusted ammonia standard granted by the Board on 4 November 2004. A copy of this petition was submitted to IEPA. This filing included a report by Brown & Caldwell Consulting Engineers of all known methods of reducing ammonia concentration in Emerald treated effluent, along with economic analyses of each option. The report concluded that while there were several technically feasible treatment methods, none of them were economically feasible. Further discussion with the IEPA has suggested several other treatment methods to be explored and Emerald has agreed to do further investigation on these methods for technical and economic feasibility.

**Special Condition 16** states that "The permittee must 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 from the Permittee's facility which the Agency specifically requests in writing that they do." No such request was issued by IEPA in 2013.

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
www.emeraldmaterials.com

**Special Condition 18** requires that "Emerald monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 IAC 302.202. The results of those analyses are shown below.

<b>Sample Date</b>	<b>Concentration</b>
28 March 2013.....	< 0.10 mg/L
21 June 2013.....	< 0.10 mg/L
17 September 2013.....	< 0.10 mg/L
14 November 2013.....	0.17 mg/L

If you have any questions, please contact me at [Kellie.Staab@EmeraldMaterials.com](mailto:Kellie.Staab@EmeraldMaterials.com) or call me at 309-364-9411.



Kellie J. Staab  
Sr. Environmental Specialist



December 30, 2014

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

CERTIFIED MAIL: 7010 3090 0003 0728 1812

**Re: NPDES Permit No. IL0001392 – Annual Ammonia Report**

Gentlemen:

**Special Condition 17** of NPDES Permit No. IL0001392 requires that Emerald Performance Materials' Henry IL facility submit an annual report summarizing the activities and results of investigations required by Special Conditions 15, 16 and 18 of the Permit.

**Special Condition 15** requires that Emerald "investigate production methods and technologies that generate less ammonia in the Permittee's discharge into the Illinois River."

In the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to WWTP to help set priorities for other projects to be undertaken to look for or implement ammonia reduction to our plant effluent. Review of the analyses results show that one product from Building 725 was a major contributor. The process uses excess t-butylamine. Efforts started in 2013 were continued into 2014 to identify the optimum excess needed to result in quality production while practicing source reduction and improving t-butylamine recovery efforts. Through the end of November, 2014, the amount of ammonia as N was reduced by 53,000 lbs compared to the same time in 2013.

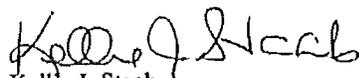
On 28 September 2012, Emerald filed with the Illinois Pollution Control Board a petition for renewal of the adjusted ammonia standard granted by the Board on 4 November 2004. A copy of this petition was submitted to IEPA. This filing included a report by Brown & Caldwell Consulting Engineers of all known methods of reducing ammonia concentration in Emerald treated effluent, along with economic analyses of each option. The report concluded that while there were several technically feasible treatment methods, none of them were economically feasible.

**Special Condition 16** states that "The permittee must 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 from the Permittee's facility which the Agency specifically requests in writing that they do." No such request was received from IEPA in 2014.

**Special Condition 18** requires that "Emerald monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 IAC 302.202. The results of those analyses are shown below.

Sample Date	Concentration
26 March 2014 .....	0.20 mg/L
26 June 2014 .....	< 0.10 mg/L
23 September 2014 .....	< 0.10 mg/L
17 November 2014 .....	< 0.10 mg/L

If you have any questions, please contact me at [Kellie.Staab@EmeraldMaterials.com](mailto:Kellie.Staab@EmeraldMaterials.com) or call me at 309-364-9411.

  
Kellie J. Staab  
Sr. Environmental Specialist

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)



January 6, 2016

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

CERTIFIED MAIL: 7015 0640 0006 8491 5235

**Re: NPDES Permit No. IL0001392 – Annual Ammonia Report**

Gentlemen:

**Special Condition 17** of NPDES Permit No. IL0001392, issued 2/9/2007, requires that Emerald Performance Materials' Henry IL facility submit an annual report summarizing the activities and results of investigations required by Special Conditions 15, 16 and 18 of the Permit.

**Special Condition 15** requires that Emerald "investigate production methods and technologies that generate less ammonia in the Permittee's discharge into the Illinois River."

In the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to WWTP to help set priorities for other projects to be undertaken to look for or implement ammonia reduction to our plant effluent. Review of the analyses results show that one product from Building 725 was a major contributor. The process uses excess t-butylamine. Efforts started in 2013 were continued through 2015 to identify the optimum excess needed to result in quality production while practicing source reduction and improving t-butylamine recovery efforts. Through the end of November, 2015, the amount of ammonia as N was reduced by 15,000 lbs compared to the same time in 2014. This reduction can be attributed to both reduced production and better process management.

On 28 September 2012, Emerald filed with the Illinois Pollution Control Board a petition for another adjusted ammonia standard, similar to the one granted by the Board on 4 November 2004. A copy of this petition was submitted to IEPA. This filing included a report by Brown & Caldwell Consulting Engineers of all known methods of reducing ammonia concentration in Emerald treated effluent, along with economic analyses of each option. The report concluded that while there were several technically feasible treatment methods, none of them were economically feasible.

**Special Condition 16** states that "The permittee must 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 from the Permittee's facility which the Agency specifically requests in writing that they do." No requests were received from IEPA in 2015. However as part of the new Adjusted Ammonia Standard issued by the IL Pollution Control Board on April 16, 2015, Emerald has requested and received proposals for conducting additional studies such as activated carbon treatment, agricultural application, and dilution with river water.

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
www.emeraldmaterials.com

**Special Condition 18** requires that "Emerald monitor ammonia nitrogen in the Illinois River on a quarterly basis to demonstrate compliance with the applicable ammonia water quality standards in accordance with 35 IAC 302.202. The results of those analyses are shown below.

<b>Sample Date</b>	<b>Concentration</b>
25 March 2015 .....	< 0.10 mg/L
25 June 2015 .....	< 0.10 mg/L
17 September 2015 .....	< 0.10 mg/L
19 November 2015.....	< 0.10 mg/L

Going forward Emerald will report according to the new Adjusted Ammonia Standard issued April 16, 2015.

If you have any questions, please contact me at [Kellie.Staab@EmeraldMaterials.com](mailto:Kellie.Staab@EmeraldMaterials.com) or call me at 309-364-9411.



Kellie J. Staab  
Sr. Environmental Specialist

# **EXHIBIT 6**



April 27, 2016

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

CERTIFIED MAIL: 7015 0640 0006 8491 6683

**Re: Adjusted Standard 13-2 (NPDES Permit No. IL0001392) – Annual Report**

Gentlemen:

As part of the latest Adjusted Ammonia Standard issued by the IL Pollution Control Board (AS13-2) on April 16, 2015, a condition was set that requires Emerald to “prepare and submit to the Agency annual reports summarizing its activities to comply with paragraphs 2(c) through 2(e) of the adjusted standard.” This letter is being sent to comply with this requirement.

The referenced paragraphs are stated below as well as Emerald’s update on activities.

2. (c). Emerald must investigate new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald’s discharge. The nitrification inhibitors such as MBT are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.

**RESPONSE**

Process improvement activities continued in 2015 to identify the optimum excess t-butylamine (a reactant in one of our processes) needed to result in quality production while practicing source reduction and improving t-butylamine recovery. The amount of ammonia as N was reduced by greater than 18,000 lbs in 2015 compared to 2014.

2. (d). Emerald must investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions.

**RESPONSE**

No new treatment technologies have been identified based on internet searches and through consultation with our network of engineers and consultants since Adjusted Standard 13-2 was issued.

2. (e). By April 16, 2018, Emerald must investigate and submit to the Illinois Environmental Protection Agency (Agency) the following studies:

i) A study evaluating the use of granulated activated carbon to treat the polymer chemicals tank waste water before it combines with non-polymer chemicals tank waste water to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment. The study must include a technical feasibility evaluation and an economic reasonableness analysis;

**Emerald Polymer Additives, LLC**

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)

ii) A study evaluating the technical feasibility and the economic reasonableness of a spray irrigation program. The studies must include an evaluation of compliance with the applicable design standards for slow rate land application of treated wastewaters (35 Ill. Adm. Code 372); and

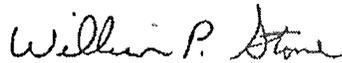
iii) A study evaluating the addition of water from the Illinois River to the wastewater to determine the potential for subsequent single-stage nitrification in light of the potential dilution. The study must include a technical feasibility evaluation and an economic reasonableness analysis.

**RESPONSE**

Emerald has requested and received proposals for conducting additional studies of activated carbon treatment, spray irrigation, and addition of river water to facilitate nitrification. Consulting firms have been identified to do the studies. These studies will start in 2016 to meet the 2018 deadline.

If you have any questions, please contact Kellie Staab, Sr. Environmental Specialist via email at [Kellie.Staab@EmeraldMaterials.com](mailto:Kellie.Staab@EmeraldMaterials.com) or call at 309-364-9411.

Sincerely,

A handwritten signature in cursive script that reads "William P. Stone".

William P. Stone  
Plant Manager



November 30, 2017

CERTIFIED MAIL: 7016 1370 0002 2632 2262

Division of Water Pollution Control  
Compliance Assurance Section – Mail Code 19  
Illinois Environmental Protection Agency  
P. O. Box 19726  
Springfield IL 62794-9276

**Re: Adjusted Standard 13-2 (NPDES Permit No. IL0001392)  
Annual Status Report**

| To Whom It May Concern:

The Henry, IL Emerald Performance Materials facility is submitting the following report to show continued compliance with the NPDES Permit No. IL0001392, specifically the Adjusted Ammonia Standard (AS13-2) found in Special Condition 16 of the above permit.

On December 1, 2016, the IL Pollution Control Board filed an Opinion and Order of the Board superseding the April 16, 2015 order. The December Order also requires Emerald to "prepare and submit to the Agency annual reports summarizing its activities to comply with paragraphs 2(c) through 2(e) of the adjusted standard." This letter is being sent to comply with this requirement.

The referenced paragraphs are stated below as well as Emerald's update on activities.

2.(c). Emerald must investigate new production methods and technologies that generate less ammonia and nitrification inhibitors in Emerald's discharge. The nitrification inhibitors such as MBT are the chief cause of inhibiting nitrification in the treatment system which allows for ammonia to discharge.

#### **RESPONSE**

Emerald has continued working towards process improvements to recover MBT in the production process. The facility engineering department is working in conjunction with production, the HSE department, and two engineering firms, as well as process improvement engineering from the Emerald corporate services to establish administrative and process controls. Any sustainable changes discovered and implemented will be provided in the 2018 report.

2.(d). Emerald must investigate new treatment technologies and evaluate implementation of new and existing treatment technology based on current plant conditions.

**RESPONSE**

No new treatment technologies have been identified since the last update report in 2016. Emerald will continue to investigate process improvements and wastewater treatment opportunities in 2018.

2.(e). By April 16, 2018, Emerald must investigate and submit to the Illinois Environmental Protection Agency (Agency) the following studies:

i) A study evaluating the use of granulated activated carbon to treat the polymer chemicals tank waste water before it combines with non-polymer chemicals tank waste water to determine if this treatment alternative effectively removes inhibitors, including MBT, which would then allow for biological treatment. The study must include a technical feasibility evaluation and an economic reasonableness analysis;

ii) A study evaluating the technical feasibility and the economic reasonableness of a spray irrigation program. The studies must include an evaluation of compliance with the applicable design standards for slow rate land application of treated wastewaters (35 Ill. Adm. Code 372); and

iii) A study evaluating the addition of water from the Illinois River to the wastewater to determine the potential for subsequent single-stage nitrification in light of the potential dilution. The study must include a technical feasibility evaluation and an economic reasonableness analysis.

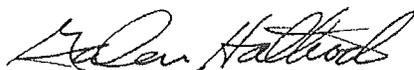
**RESPONSE**

The Henry facility has contracted with engineering and consulting firms to conduct studies discussed in subsections 2.(e)(i) and 2.(e)(ii). The results of these studies will be provided in the April 2018 report.

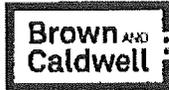
As for the study in section 2.(e)(iii), Emerald has significant concerns regarding the consistency of the proposed spray irrigation study with federal law. This option is currently in review and an update will be provided in subsequent correspondence.

If you have any questions, please contact David Sikes, EHS&S Manager via email at [David.Sikes@emeraldmaterials.com](mailto:David.Sikes@emeraldmaterials.com) or call directly to his office at 309-364-9472.

Respectfully,



Galen Hathcock  
Plant Manager



## Technical Memorandum

220 Athens Way, Suite 500  
Nashville, TN 37228

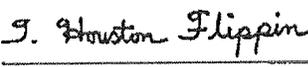
T: 615.255.2288  
F: 615.256.8332

Prepared for: Emerald Performance Materials  
Project Title: Henry Nitrification Evaluation  
Project No.: 149470

### Technical Memorandum

Subject: Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility  
Date: April 13, 2018  
To: David Sikes, Environmental, Health and Safety Manager  
From: Houston Flippin, P.E., BCEE, Chief Engineer  
Copy to: Charlie Gregory, Project Engineer

Prepared by:   
Charlie Gregory, Project Engineer

Reviewed by:   
Houston Flippin, P.E., BCEE, Chief Engineer

#### Limitations:

*This document was prepared solely for Emerald Performance Materials in accordance with professional standards at the time the services were performed and in accordance with the contract between Emerald Performance Materials and Brown and Caldwell. This document is governed by the specific scope of work authorized by Emerald Performance Materials; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Emerald Performance Materials and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.*

## Table of Contents

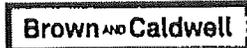
List of Figures .....	ii
List of Tables.....	ii
Section 1: Introduction.....	1
1.1 Background.....	1
1.2 Scope of Work.....	2
Section 2: Laboratory Testing.....	3
2.1 Return Activated Sludge (RAS) Washing.....	4
2.2 Settling Tests and Granular Activated Carbon Testing (GAC).....	4
2.3 Feed Characterization.....	6
2.4 FBR Testing.....	8
2.5 Results.....	9
2.6 Summary of Treatability Testing.....	12
Section 3: Conceptual Level Design and Cost Estimates .....	13
3.1 Solids Separation and GAC treatment of PC/C-18 Wastewaters.....	13
3.2 River Water Dilution System.....	15
Attachment A: Capital Cost Estimate .....	A-1
Attachment B: Block Flow Diagram (BFD).....	B-1

## List of Figures

Figure 1: Block Flow Diagram of Wastestream Sources and WWTF .....	2
Figure 2. Freundlich Isotherm for MBT removal.....	5
Figure 3. BTA Removal Isotherm .....	6
Figure 4. FBR 2 NH <sub>3</sub> -N Removal and NO <sub>x</sub> -N Generation .....	9
Figure 5. FBR 3 NH <sub>3</sub> -N Removal and NO <sub>x</sub> -N Generation.....	10
Figure 6. FBR 4 NH <sub>3</sub> -N Removal and NO <sub>x</sub> -N Generation.....	11
Figure 7. FBR 5 NH <sub>3</sub> -N Removal and NO <sub>x</sub> -N Generation.....	12
Figure 8. MBT Concentration.....	12

## List of Tables

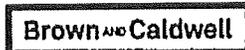
Table 1. FBR Tests Performed .....	3
------------------------------------	---



Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

---

Table 2. Settling Test Results .....	4
Table 3. GAC Test Results .....	5
Table 4. Henry Waste Stream Composition .....	7
Table 5. Feed Characterization .....	7
Table 6. Virgin GAC (OLC12X40) Treatment O&M Costs .....	14
Table 7. Regenerated GAC (DSR-A) Treatment O&M Costs .....	14
Table 8. River Water Dilution O&M Costs .....	16



## Section 1: Introduction

### 1.1 Background

The combined wastewater generated at the Emerald Performance Materials - Henry Plant (Emerald) has historically contained high concentrations of Total Kjeldahl Nitrogen (TKN) and ammonia-nitrogen (NH<sub>3</sub>-N), as well as a known nitrification-inhibiting compound, mercaptobenzothiazole (MBT). This known inhibitor is the compound that serves as the foundational building block of essentially all products at the Emerald Henry Plant.

Both Emerald and Mexichem are co-located at the Henry Plant having at one time been all part of the BF Goodrich Specialty Chemicals plant. Together, these two industries discharge to a shared industrial wastewater treatment facility (IWTF) operated by Emerald (see Figure 1). The wastewaters from Emerald discharge to two equalization tanks: the C-18 Tank and the PC Tank. The wastewaters from Mexichem production discharge to an equalization tank with one Mexichem wastewater (213 Centrate) stream receiving special pretreatment. The wastewaters from the two Emerald tanks, one Mexichem tank, and the Mexichem pretreated wastewater are all discharged to an onsite IWTF. In addition, waters from groundwater recovery, production area stormwater, and utility waters are also treated in the IWTF. The IWTF provides chemical conditioning, primary settling to remove solids, activated sludge treatment to remove biologically degradable materials and tertiary filtration prior to discharge to the Illinois River. The solids from primary settling, Mexichem pretreatment and the waste solids from activated sludge treatment are dewatered using a precoat filter press. The dewatered solids are disposed of off-site. Figure 1 illustrates this wastewater collection and treatment system.

Evaluation of Nitrification Alternatives for Emerald Henry, Illinois Facility

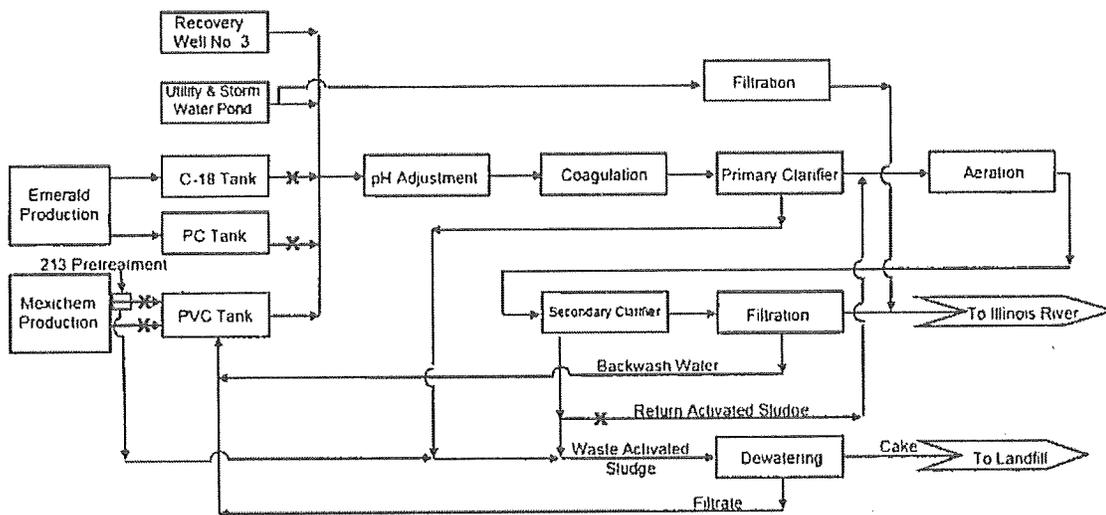


Figure 1: Block Flow Diagram of Wastestream Sources and WWTF

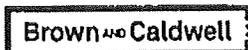
Due to the necessity of MBT use in Emerald's production processes, effluent  $\text{NH}_3\text{-N}$  removal at the Henry Plant is typically low. Brown and Caldwell (BC), at the request of Emerald, has conducted the studies listed below and described herein to satisfy Condition 2 (e) of Adjusted Standard 13-2 issued by the Illinois Pollution Control Board (IPCB), which has been incorporated into Special Condition 15 of the Plant's National Pollution Discharge Elimination system permit (IL0001392) issued by the Illinois Environmental Protection Agency (IEPA):

1. Provide Granular Activated Carbon (GAC) Treatment on the Polymer Chemicals (PC) wastewater to remove MBT so that nitrification can occur.
2. Provide river water dilution to the primary clarifier effluent so that MBT may be diluted and nitrification can occur.

Emerald also requested BC to investigate the technical and economic viability of each.

## 1.2 Scope of Work

The scope of work for these studies consisted of bench scale treatability testing and developing a preliminary design and cost estimate for each option. Laboratory testing was required to evaluate nitrification potential and feasibility. Based on the results from the bench scale tests, preliminary designs and a class 5 cost estimate were completed to investigate the economic feasibility of achieving nitrification (biological ammonia-nitrogen removal) through these two methods in comparison to  $\text{NH}_3\text{-N}$  removal technologies previously considered. Lastly, these costs were compared to the costs imposed by municipalities on industries to provide  $\text{NH}_3\text{-N}$  removal.



## Section 2: Laboratory Testing

Fed Batch Reactor (FBR) testing was performed to investigate the ability for nitrification to occur in pretreated and untreated wastewater. During an FBR test, a wastewater is fed to a batch reactor with a fixed biomass population. This configuration allows for the fraction of wastewater in the beaker to increase over time based on a chosen food to mass (F/M) ratio. Thus, the nitrification rate as well as the fraction of wastewater inhibitory to the biomass (generally washed return activated sludge (RAS) from the Henry Plant plus dissolved solids (salt) and pure culture nitrifying bacteria (nitrifiers)) can be ascertained from the results. FBR tests were performed on five combinations of biomass and test waters to investigate the viability of GAC treatment and river water dilution in facilitating nitrification in the IWTF. Table 1 outlines the five FBR tests run during this investigation.

Table 1. FBR Tests Performed		
Test	Biomass	Wastewater
FBR 1	Washed RAS + TDS Adjusted Nitrifiers	Unpretreated Primary Clarifier Effluent
FBR 2	Washed RAS + TDS Adjusted Nitrifiers	Primary Clarifier Effluent with PC and C-18 pretreated with GAC
FBR 3 (Control Rd. 1)	Washed RAS + TDS Adjusted Nitrifiers	River water with NH4Cl
FBR 4	Washed RAS + River water TDS Adjusted Nitrifiers	10% Unpretreated Primary Clarifier Effluent and 90% River water
FBR 5 (Control Rd. 2)	Washed RAS + River water TDS Adjusted Nitrifiers	River water with NH4Cl

FBR Tests 3 and 5 were run as controls containing the pure culture nitrifiers at different design total dissolved solids (TDS) values. The controls were used to obtain an uninhibited nitrification rate. FBR Test 1 was designed to investigate any possible nitrification experienced with average levels of MBT fed to the current Henry biomass with nitrifying bacteria added. FBR 2 was designed to investigate the ability for nitrification to occur in a test fed GAC treated PC wastewater. FBR Test 4 was performed to investigate if nitrification inhibition would occur if the waste stream remained unpretreated, but heavily diluted with river water.

To simulate the pretreated clarifier effluent, settling tests and GAC tests were performed on combined wastewater collected from the PC and the Cure-Rite® 18 (C-18) equalization tanks. Both these wastewaters are generated through production processes in the Emerald plant. The purpose of these tests was to identify the required solids removal system and to determine the required GAC dose to achieve a target MBT concentration of less than 15 mg/L in the PC wastewater discharge. This settled and GAC treated PC/C-18 wastewater was fed to FBR Test 2.

**Brown AND Caldwell**

## 2.1 Return Activated Sludge (RAS) Washing

The RAS samples provided by Emerald Performance Materials were washed as they arrived at BC's Industrial Treatability Laboratory in Nashville, TN. The RAS samples were washed 8,000-fold at a pH of nine in TDS adjusted river water. After this washing, decant from the RAS was characterized to insure MBT was less than 1 mg/L, pH was adjusted to 7.2, and the decant was re-sampled to ensure MBT was at target concentrations. MBT in both samples was less than 0.04 mg/L.

## 2.2 Settling Tests and Granular Activated Carbon Testing (GAC)

Prior to FBR testing, settling and GAC tests were performed on the PC/C-18 WW. The settling tests were performed to size a new inclined plate separator prior to GAC treatment. This would aid in the removal of total suspended solids (TSS) prior to carbon treatment. The GAC testing was performed to quantify the GAC dosage necessary so that PC/C-18 WW would not inhibit nitrification.

The PC and C-18 waste streams were blended proportionally to the current average flow of each stream. After being blended, pH was adjusted to 10 using sodium hydroxide (NaOH). While the pH was at 10, settling tests were performed. Table 2 provides the results from the settling tests.

Table 2. Settling Test Results	
HRT (gpd/ft <sup>2</sup> )	TSS (mg/L)
No Settling	127
50	9
300	63
600	65
900	63
1,200	80

The 50 gpd/ft<sup>2</sup> test was the only settling test performed that produced a supernatant TSS of 9 mg/L, with a goal of less than 20 mg/L. This was done to mimic the expected TSS quality after treatment with an inclined plate separator. This sample was collected and analyzed for MBT. The resulting MBT is seen in Table 3 as a GAC dosage equal to 0 mg/L.

After settling tests were performed, testing was conducted on the pretreated PC/C-18 WW to determine the concentration of GAC needed to decrease the MBT concentration below 15 mg/L. Table 3 provides the dosages and MBT results from the GAC testing.

Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

Table 3. GAC Test Results	
GAC Dosage (mg/L)	MBT (mg/L)
0	320
1,200	230
5,800	83
10,300	10*
14,900	18
19,400	8.4
24,000	0.99

\* Suspect data point.

Results from the GAC tests show that the dosage of GAC to achieve less than 15 mg/L MBT is approximately 17,000 mg/L. In the makeup of the pretreated feed for FBR Test 2, a dosage of 20,000 mg/L was used for pretreatment of the PC/C-18 WW prior to the feed makeup. This dose was selected to provide a margin of safety in achieving adequate MBT removal. The Freundlich isotherm developed from the GAC doses is presented in Figure 2.

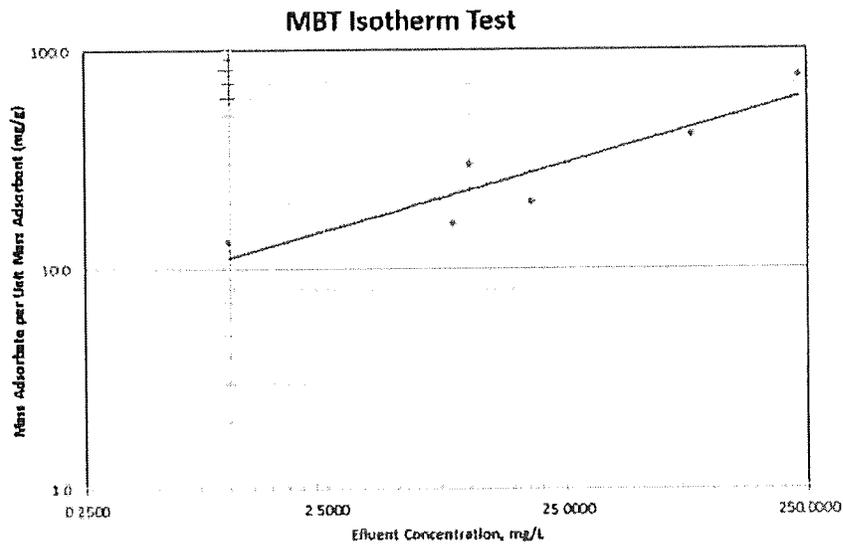


Figure 2. Freundlich Isotherm for MBT removal

Calgon Filtrasorb-300 (F-300), Calgon's most popular GAC media for industrial wastewater applications was deemed adequate and therefore used for the testing performed. Virgin F-300 was chosen for this investigation since it offers good adsorptive properties for a wide range of compounds including MBT.

**Brown AND Caldwell**

Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

When MBT is the primary compound being removed by GAC, Calgon Carbon recommends their OLC 12X40 product as being their most efficient product. The OLC 12X40 was recommended by Calgon based on GAC performance with benzotriazole (BTA) removal. BTA is similar in chemical structure to MBT. Calgon believed that removal of BTA through carbon adsorption would be similar to that of MBT. The quantity of MBT removed per mass of GAC (X/M) increase in performance was based on Figure 2 provided by Calgon. The 10 percent improvement in MBT removal assumes that a concentration of 320 mg/L MBT would exist in the PC/C-18 WW. Based on Figure 3, F-300 would have a capacity of approximately three grams of BTA/100 grams carbon. The OLC 12X40 would have an approximate capacity of 3.3 grams of BTA/100 grams carbon. This leads to the assumptions that the OLC 12X40 could potentially have a 10 percent better MBT removal compared to the F-300. In addition, the F-300 is 50 percent costlier. Based on these facts, BC assumed that the lower cost and potentially 10 percent better OLC 12X40 would be used in preparing cost estimates for full-scale application.

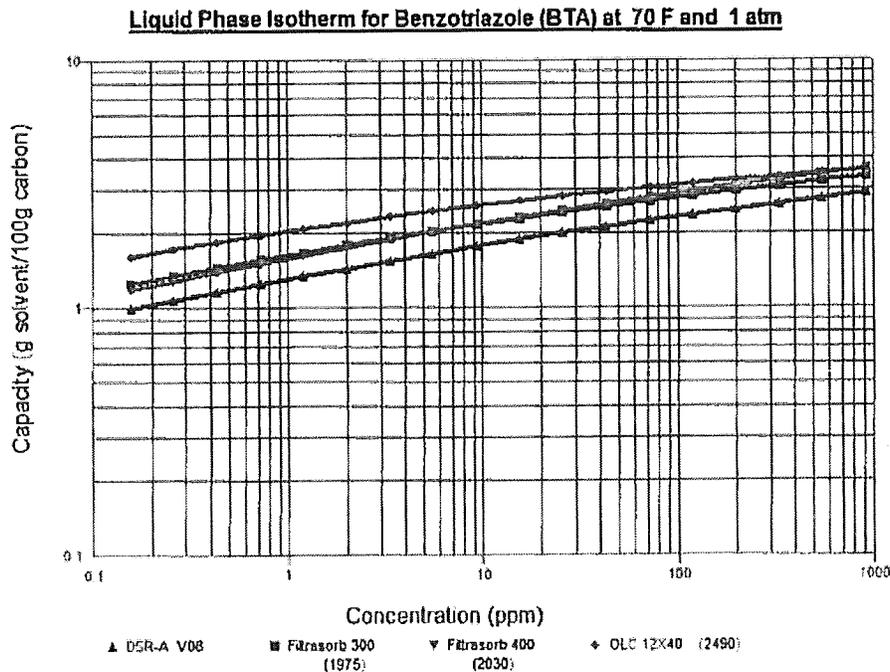
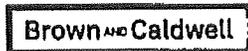


Figure 3. BTA Removal Isotherm

### 2.3 Feed Characterization

Following pretreatment, feeds were made for each FBR test. The feed makeup for FBR Tests 1 and 2 were based upon the current average waste stream flows experienced at the Henry facility as illustrated in Table 4. PC and C-18 wastewaters have been previously described as wastewaters that originate from Emerald production. Wastewaters from Mexichem polyvinyl chloride production were collected prior to the Polyvinyl Chloride (PVC) tank and termed PVC wastewater. Mexichem makes a product know as 213. The



Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

product is centrifuged to remove water. The water removed is discharged to a pretreatment system that consists of chemical conditioning and gravity settling of the solids. The treated water from this process was termed 213 Centrate.

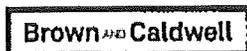
Feed 1 contained the composition of wastewaters illustrated in Table 4 and was subjected to simulated primary treatment and analyzed. This simulation consisting of coagulant addition (using FeCl<sub>3</sub>), rapid mix, flocculant addition, flocculation and gravity settling at pH 9 as practiced by the plant. Feed 2 was identical to Feed 1 except that the PC and C-18 wastewaters were treated with 20 grams per liter of F-300 GAC. The FBR control tests (Round 1 and Round 2) evaluated feeds composed of tap water, nutrients, alkalinity, and salt. The simulated river water dilution feed was composed of 90% tap water with nutrients, alkalinity, and salt. The other 10% of the feed consisted of Feed 1. The 10:1 dilution was provided in order that the FBR test could operate without nitrification inhibition at least during the beginning of the test. The characteristics of these respective streams are described in Table 5.

Stream	Flow (gpm)	Percent Makeup (%)
Emerald PC WW	82	18.6
Emerald C-18	1.8	0.4
Mexichem PVC WW	345	78.3
Mexichem 213 Centrate	11.7	2.7

Test	Sample	TKN (mg/L)	NH <sub>3</sub> -N (mg/L)	NO <sub>x</sub> -N (mg/L)	MBT (mg/L)	cBOD (mg/L)	COD (mg/L)
FBR 1	Feed 1	60	28.1	2.13	50	63.4	890
FBR 2	Feed 2	45.8	28.2	1.68	0.09	<37.5	390
FBR 3	Control Round. 1	0	78.2	0	0	NA	0
FBR 4	River Water Dilution Feed	6	108.2	0.21	5	6.3	74
FBR 5	Control Round. 2	0	100.2	0	0	NA	0

Note: TKN test does not detect all forms of organic nitrogen. The average effluent flow and NH<sub>3</sub>-N concentration during 2017 were 0.70 million gallons per day (MGD) and 90 mg/L respectively, yielding an average NH<sub>3</sub>-N mass of 525 lbs/day.

A Potassium phosphate (KH<sub>2</sub>PO<sub>4</sub>) buffer containing NaOH was added to the feed of each FBR to provide sufficient alkalinity for complete nitrification. Supplemental NH<sub>3</sub>-N was added to FBR Tests 3, 4, and 5 so that nitrification rates could be established for each FBR. Using the KH<sub>2</sub>PO<sub>4</sub> buffer also provided sufficient phosphorous for each FBR. A micronutrient broth was also added to each FBR's feed to ensure that micronutrient limitations would not exist in any FBR test. The pH in all tests was maintained between 6.7 and 7.5.



## 2.4 FBR Testing

Two rounds of FBR testing were performed to investigate both treatment alternatives. The first round consisted of FBR 1, FBR 2, and FBR 3. Round two consisted of FBR 4 and FBR 5. During the FBR testing, wastewater is fed to a batch reactor with a fixed biomass population. This configuration allows for the fraction of wastewater in the beaker to increase over time based on a chosen F/M ratio. Thus, the nitrification rate as well as the fraction of wastewater inhibitory to the biomass can be ascertained from the results.

The FBR tests were designed to be fed based on the F/M currently targeted at the Henry, IL facility of 0.25 day<sup>-1</sup>. This was altered for FBR Test 2 so that the flow would match the flow experienced at the current facility and not the F/M outlier due to a drop in COD from pretreatment.

All tests were provided with TDS-adjusted, pure-culture nitrifying bacteria. Nitrifiers were TDS adjusted over several days to match the TDS in the feeds. Baseline nitrification rates were generated from the TDS adjusted nitrifiers. The rates developed were:

- active nitrification rate of 1.16 mg N/mg MLVSS/day for nitrifiers at 11,300 mg/L TDS
- active nitrification rate of 0.39 mg N/mg MLVSS/day for nitrifiers at 1,650 mg/L TDS

Based on these rates, 0.27 grams of nitrifiers at a TDS of 11,300 mg/L was added to FBR Tests 1, 2, and 3. For FBR Tests 4 and 5, 2.1 grams of nitrifiers at a TDS of 1,650 mg/L were added. Prior to FBR testing, the temperature of the biomass and the pure culture nitrifiers was slowly increased to 32 °C. The rates of each individual FBR test were compared with the rates measured in the controls (mg NH<sub>3</sub>-N removed/mg pure culture nitrifier/day).

The FBR tests progressed in the following manner:

1. The biomass (MLVSS) in each beaker was approximately the same in FBR Tests 1, 2, and 3. This was accomplished by concentrating the biomass via centrifugation to create a slurry of approximately 2.5 percent solids (25,000 mg/L) first. In FBR Tests 4 and 5, the concentration of biomass slurry was approximately 0.5 percent solids (5,000 mg/L).
2. The concentrated biomass slurry was placed in a 2-L beaker along with the nitrifiers, mixed with an overhead mixer and aerated with pure oxygen to maintain dissolved oxygen (DO) greater than 5 mg/L. The 2-L test beakers were then placed in a water bath at 32 °C.
3. As the wastewater was fed to the slurry, the volume of the beaker increased. The exposure concentration of the treated wastewater to the biomass (bacteria) increased from zero percent to the target 89 percent wastewater.
4. Samples collected represented effluent samples containing a desired percentage of biologically treated feed wastewater in the presence of the biomass. The sample was centrifuged to remove solids and the biomass were returned to the reactor in order to maintain a consistent mass of biomass in the test reactor. The sample volume was recorded during every sampling event.
5. During testing, samples were collected when treated influent wastewater comprised approximately 13 percent, 26 percent, 48 percent, 72 percent and 89 percent of the collected sample. These samples were then analyzed for indications of nitrification inhibition through NH<sub>3</sub>-N reduction and nitrate-nitrogen accumulation. Ideally, these values would be identical. In practice, the nitrification rate was calculated as the average between the ammonia-nitrogen reduction rate and the nitrate-nitrogen accumulation rate.

## 2.5 Results

Figures 4, 5, 6, and 7 summarize the results of the FBR testing. All tests in Round 1 and Round 2, except the untreated feed FBR, experienced consistent removal of  $\text{NH}_3\text{-N}$  through the end. No nitrification was observed between 13% and 60% of the treated wastewater addition for FBR 1, which is consistent with the absence of nitrification in the full-scale facility.

In Round 1, Figures 4 and 5 illustrate that nitrification did not begin until two hours into the test. At this point, 22 percent by volume of treated wastewater was present in the test. This is to be expected since the nitrifiers required some acclimation time after being washed. In a full-scale system, this would not be experienced if a viable colony of nitrifiers existed. Based on the results from  $\text{NH}_3\text{-N}$  removal and  $\text{NO}_x\text{-N}$  generation, a relative nitrification rate was developed. The control reactor in Round 1 (FBR 3) had an average active nitrification rate of 1.32 mg N/mg MLVSS active nitrifier/day illustrating that the nitrifiers were uninhibited during testing. The simulated clarifier effluent with GAC pretreatment of PC and C-18 wastewaters exhibited minimal impacts on nitrification where an average active nitrification rate of 1.17 mg N/mg MLVSS/day was calculated for FBR test 2. Both rates were greater compared to the initial baseline proving that GAC treatment of the PC/C-18 wastewater would facilitate nitrification of the combined wastewater at the Henry Plant. These results indicate that without pretreatment to remove or greatly dilute MBT, no nitrification would be observed at the Henry Plant.

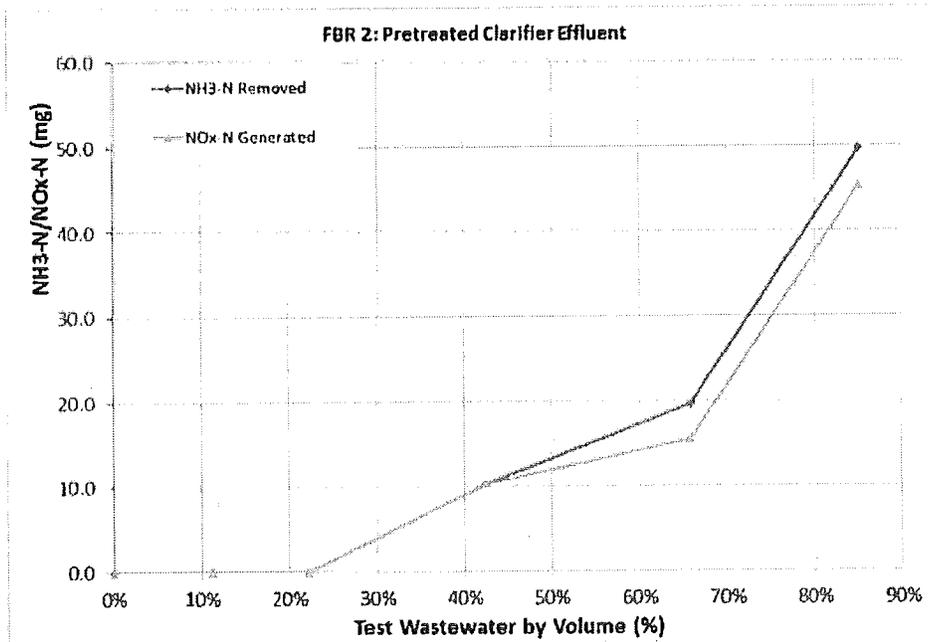


Figure 4. FBR 2  $\text{NH}_3\text{-N}$  Removal and  $\text{NO}_x\text{-N}$  Generation

Evaluation of Nitrification Alternatives for Emerald Henry, Illinois Facility

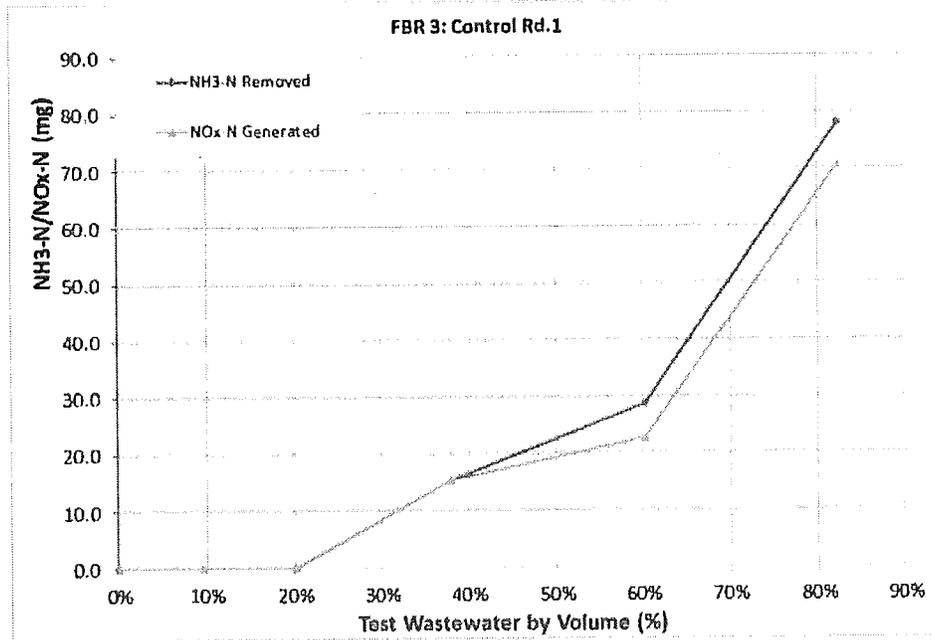


Figure 5. FBR 3 NH<sub>3</sub>-N Removal and NO<sub>x</sub>-N Generation

In Round 2, Figures 6 and 7 depict NH<sub>3</sub>-N degrading from the beginning of the test. NH<sub>3</sub>-N removal was slower at the beginning of the test as the biomass began to get acclimated to the addition of each feed. In round 2, the control reactor (FBR 5 as illustrated in Figure 7) had an average nitrification rate of 0.37 mg N/mg MLVSS active nitrifier/day with an increasing rate during the tests indicating that the nitrifiers were not inhibited during the control test. Utilizing river water to dilute the unpretreated clarifier effluent (FBR 4 as illustrated in Figure 6) by 90 percent did not completely eliminate nitrification inhibition as evidenced by the 20 percent lower average nitrification rate of 0.29 mg N/mg MLVSS active/day. This inhibition was anticipated since the concentration of MBT exceeded the published nitrification inhibition threshold of 3 mg/L during the second half of the test when the test wastewater exceeded 60 percent in volume.

Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

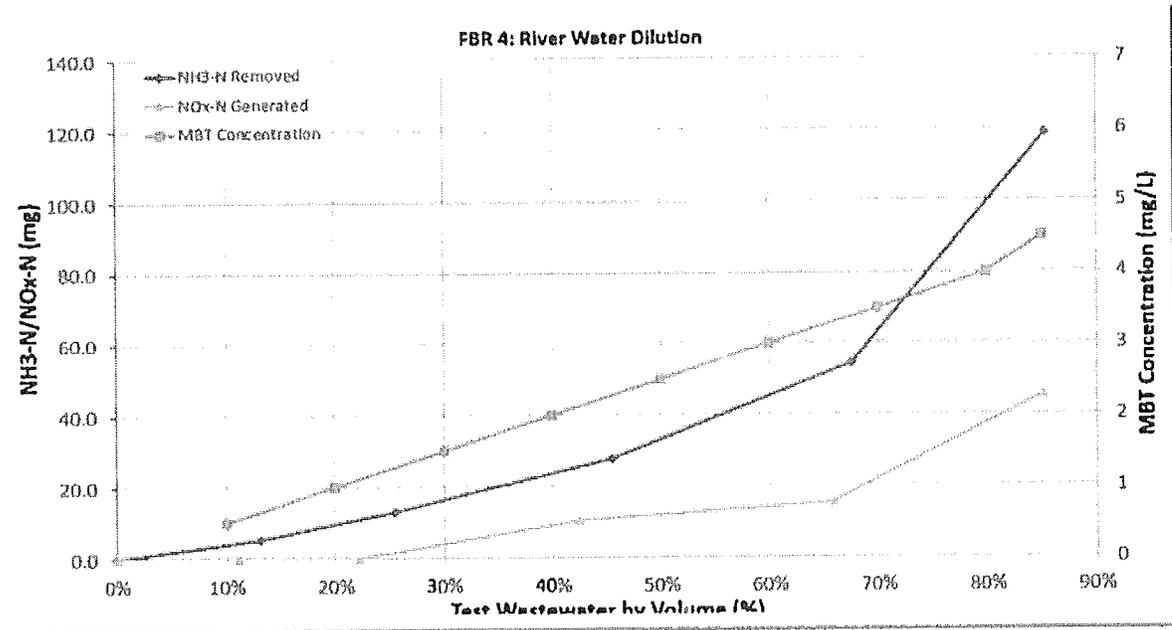
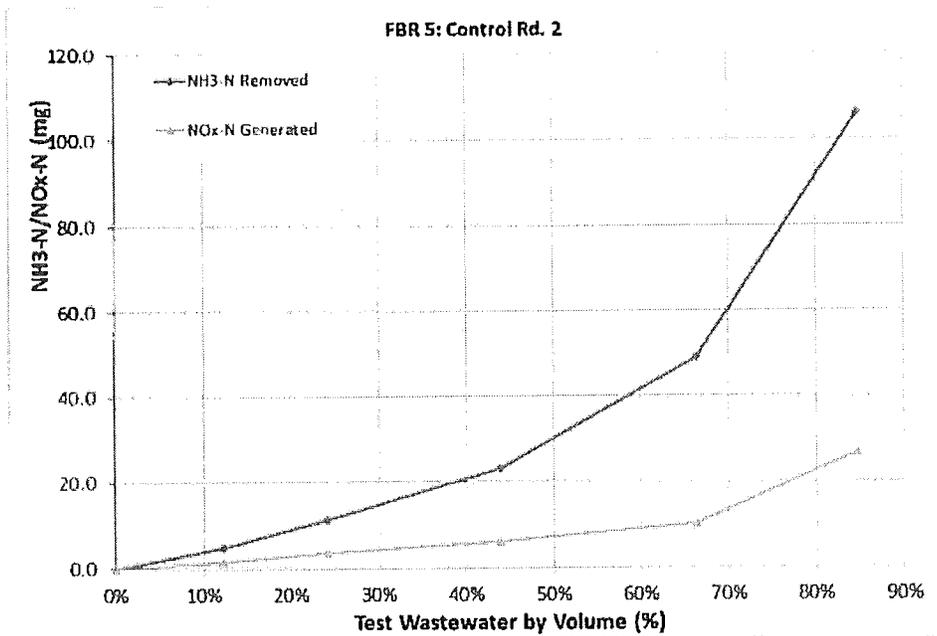


Figure 6. FBR 4 NH<sub>3</sub>-N Removal and NO<sub>x</sub>-N Generation



**Brown & Caldwell**

Figure 7. FBR 5 NH<sub>3</sub>-N Removal and NO<sub>x</sub>-N Generation

Figures 6 and 8 illustrate the buildup in MBT concentration during the FBR tests. Based on published literature and previous testing performed by BC, MBT would be expected to cause nitrification inhibition at approximately 3 mg/L<sup>1</sup>. Based on this result, nitrification inhibition did occur at approximately 3.5 mg/L. Minimal concentrations of MBT were observed in the pretreated clarifier effluent allowing the reactor to nitrify uninhibited.

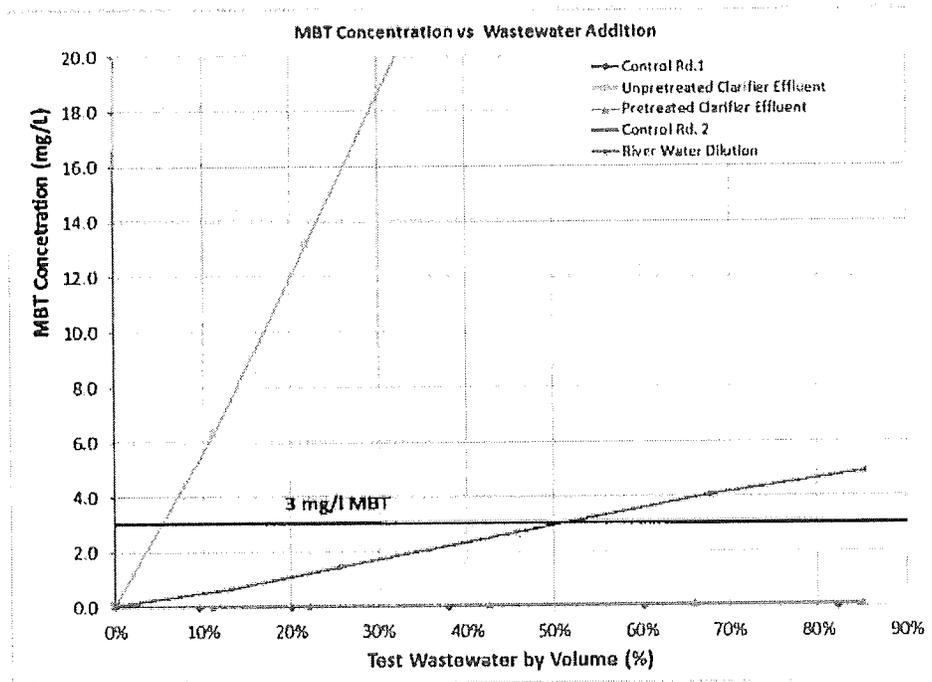


Figure 8. MBT Concentration

## 2.6 Summary of Treatability Testing

Based on FBR testing performed, the following conclusions were made:

- The untreated wastewater will continue to cause substantial nitrification inhibition due to high concentrations of MBT.
- Pretreatment of the PC/C-18 wastewater utilizing solids separation and GAC would allow the Henry Plant to nitrify in an uninhibited manner following removal of MBT from the biomass through alkaline washing.

<sup>1</sup> Hockenbury, M.R., and C.P.L. Grady: J. Water Pollut. Control Fed., vol. 49, p 768, 1977.

Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

- Diluting the unpretreated clarifier with river water requires a river water percentage in excess of 90% for uninhibited nitrification to occur. At 90% dilution, the nitrification rate observed could be sustainable as long as the MBT concentration in the PC/C-18 wastewater remained within values tested. The sustainability of this treatment alternative, NH<sub>3</sub>-N removal, performance is unlikely due to the inherent variability of the influent MBT concentration and the difficulty in maintaining target temperatures in the biological treatment systems while heating a large river water flow (approximately 7 MGD).
- Both the pretreatment option and the river water dilution option would allow biological nitrification. However, neither would be economically reasonable as discussed below.

### Section 3: Conceptual Level Design and Cost Estimates

At the conclusion of treatability testing, BC developed conceptual designs and Class 5 cost estimates to evaluate additional equipment facility changes needed for each alternative. A Class 5 estimate is considered to be a conceptual level estimate and is performed when 0 to 2% of the design has been completed. Accuracy for a Class 5 estimate is expected to fall between -50% to +100% of the cost. Class 5 estimates are used to prepare planning level cost scopes or evaluation of alternative schemes, long range capital outlay planning and can also form the base work for the Class 5 Planning Level or Design Technical Feasibility Estimate. As a result, these estimates are intended only for use as aids in conceptual level treatment selection. In order to develop the cost estimates, the major equipment for each option were established and sized. Equipment costs were developed from vendor quotes as well as BC's cost database. The following assumptions were made in the development of the estimates:

- Adequate power is available
- Easy access to equipment installation locations
- No special requirements for electrical equipment (e.g., explosion proof)
- No buildings are included

A complete breakdown of the capital costs associated each alternative is presented in Attachment A. The major annual operating and maintenance (O&M) costs are summarized in Table 6 and Table 7.

#### 3.1 Solids Separation and GAC treatment of PC/C-18 Wastewaters

In this alternative, wastewaters would be discharged to an inclined plate separator (lamella clarifier) sized for an average loading of 50 gpd/sq ft. BC has assumed that current pump conveying the PC/C-18 wastewater is sufficient for future use for conveying wastewater to the clarifier. The sludge from this clarifier would be discharged to the existing plate and frame filter press for dewatering. Effluent from the clarifier will be pumped to a 5,000-gallon poly holding tank that will be pumped to four GAC vessels (containing 40,000 lbs GAC each) operated in series to the existing primary treatment system. The GAC housed in the lead column would be changed approximately every seven days. Sizing of the GAC columns was based on average flow conditions. During peak conditions, the 40,000 lbs GAC vessels would be able to handle additional flow. GAC would need to be replaced more often during increased MBT loads. GAC effluent will flow from the GAC vessels to a 5,000-gallon poly tank. This tank will be used to dampen flow to the primary system, from the surge tank, flow will be pumped to the primary clarifier. A block flow diagram of this system is described in Attachment B.

**Brown and Caldwell**

Evaluation of Nitrification Alternatives for Emerald Henry, Illinois Facility

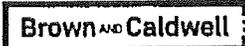
Based on the new equipment and construction needed for this alternative, the expected total capital cost would be \$5,274,000 with a range from \$2,637,000 (-50%) to \$10,548,000 (+100%). The full capital estimate is described in Attachment A.

The O&M costs only consider the incremental O&M costs associated with the upgraded equipment. If regenerated carbon is used, the X/M will decrease by approximately 30 percent based on estimates provided by Calgon Carbon and the cost of carbon would decrease 50 percent. These prices assume that exhausted carbon will be hauled to Calgon Carbon's regeneration facility in Catlettsburg, Kentucky. BC has assumed that labor costs will not increase in this alternative. Table 6 and Table 7 provides the O&M costs associated with this alternative depending on GAC selection.

<b>Table 6. Virgin GAC (OLC12X40) Treatment O&amp;M Costs</b>			
Parameter	Quantity	Unit Cost	Annual Cost, \$/yr
Virgin Granular Activated Carbon	5,220 lbs/day	\$2.00/lb	\$3,811,000
Electricity	60 hp	\$0.0495/kwh	\$19,400
Maintenance		8% of motorized equipment cost	\$33,800
Alkalinity Addition	6000 lbs/day of 50% NaOH	\$250/ton	\$274,000
Additional Blower Operation	70 hp	\$0.0495/kwh	\$22,600
<b>Total</b>			<b>\$4,160,000</b>

<b>Table 7. Regenerated GAC (DSR-A) Treatment O&amp;M Costs</b>			
Parameter	Quantity	Unit Cost	Annual Cost, \$/yr
Regenerated Granular Activated Carbon	7,540 lbs/day	\$1.00/lb	\$2,752,100
Electricity	60 hp	\$0.0495/kwh	\$19,400
Maintenance		8% of motorized equipment cost	\$33,800
Alkalinity Addition	6000 lbs/day of 50% NaOH	\$250/ton	\$274,000
Additional Blower Operation	70 hp	\$0.0495/kwh	\$22,600
			<b>\$3,102,000</b>

The O&M costs for GAC treatment is driven by the low adsorptive capabilities of MBT by carbon experienced in the bench scale testing.



Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

The capital cost for this option is approximately \$5.3 million with a present worth cost of \$27 million assuming a 10-year project duration, zero salvage value, 5% interest and 2% inflation. This investment would result in an approximately 1.9 million pounds of NH<sub>3</sub>-N being removed over the course of 10 years at an average cost of \$14/pound of NH<sub>3</sub>-N removed. This is 20-fold higher than the costs reported by the Publicly Owned Treatment Works serving Decatur, Illinois; Bloomington, Illinois and Normal, Illinois in 2015 (less than \$0.70/pound of NH<sub>3</sub>-N). This is 11-fold higher than the median cost reported by 15 reporting entities in the 2015 survey conducted by the National Association of Clean Water Agencies (\$1.33 per pound of NH<sub>3</sub>-N removed). Based on this comparison, the removal of NH<sub>3</sub>-N at the Emerald plant is not economically reasonable.

### 3.2 River Water Dilution System

In this alternative, all the current waste streams will remain routed as they currently are at the facility. The C-18 wastewater, PC wastewater, and PVC wastewater will all be chemically conditioned and be conveyed to the primary clarifier. From the clarifier, the waste stream will be conveyed to the aeration basin. In addition to the waste stream being routed to the aeration basin, a new lift station will be installed to pump river water from the Illinois River to provide a dilution stream to the waste water. The river water will be pumped to the aeration basin at approximately 7 MGD to dilute MBT. It is assumed that the river water requires no treatment. A steam injection will be installed to ensure that the temperature in the aeration basin will remain at 85 °F year-round. This is the operating temperature to achieve the required Biochemical Oxygen Demand (BOD) removal based on historical performance. The capital cost of the steam generation and supply system was not added to the capital cost estimates due the excessive size needed for this application (a 140 million BTU/hr boiler output would be necessary which is 40-fold greater than the January 2018 consumption by the entire facility). After the aeration basin, a splitter box will be installed to split flow between three clarifiers. Two new 100-foot clarifiers will need to be installed and put into service along with the existing 60-foot clarifier. In addition to the new clarifiers, two new sludge pumps will be needed to convey the mixed liquor back to the aeration basin or to the existing belt filter press. BC has assumed for this evaluation that the current belt filter press will be sufficient for the future needs of the facility.

The supernatant from the clarifiers will also require filtration after clarification, this will require two, new sand filters (each with 1500 ft<sup>2</sup> of filtration area). Effluent from the clarifiers will gravity flow to the new sand filter units. The filtered effluent will then be conveyed back to the Illinois River. Piping would need to be upsized throughout the facility to handle the increased flow. No additional changes would be needed for the rest of the treatment system. A block flow diagram of this system is described in Attachment B.

The sustainability of this treatment alternative NH<sub>3</sub>-N removal performance is unlikely due to the inherent variability of the influent MBT concentration and the difficulty in maintaining target temperatures in the biological treatment systems while heating a large river water flow (approximately 7 MGD). The addition of river water would be based on percent flow and not MBT concentration. The MBT concentration in the wastewater fluctuates with production. The fluctuation would cause inconsistent nitrification and take several days to remove excess MBT concentrations from the system resulting in several days of low nitrification (high effluent NH<sub>3</sub>-N concentrations). In addition to fluctuating MBT, the winter months would also negatively impact the treatment system if river water temperature control were not maintained. This river water (approximately 7 MGD) would have to be heated year-round to a target temperature of 85 °F from an initial temperature that varies by more than 40 °F (below 40 °F to 79 °F). Steam injector would be required year-round.

Based on the new equipment and construction needed for this alternative, the expected total capital cost would be \$22,600,000 with a range from \$11,286,500 (-50%) to \$45,146,000 (+100%) excluding the

**Brown & Caldwell**

Evaluation of Nitrification Alternatives for Emerald Henry, Illinois Facility

steam supply system. The full capital estimate (excluding steam supply system) is described in Attachment A.

The O&M costs only take into account the new O&M costs associated with the upgraded equipment. BC has assumed that labor costs will not increase in this alternative. Table 8 provides the O&M costs associated with this alternative.

Table 8. River Water Dilution O&M Costs			
Parameter	Quantity	Unit Cost	Annual Cost, \$/yr
Electricity	260 hp	\$0.0495/kwh	\$136,000
Maintenance		8% of motorized equipment cost	\$288,000
Steam	22,600 therms/day	\$0.446/therm	\$3,679,000
Alkalinity Addition	6000 lbs/day of 50% NaOH	\$250/ton	\$274,000
Additional Blower Operation	70 hp	\$0.0495/kwh	\$22,600
Total			\$4,400,000

The capital cost for this option is approximately \$23 million (excluding steam supply system) with a present worth cost of \$54 million assuming a 10-year project duration, zero salvage value, 5% interest and 2% inflation. This investment would result in an approximately 1.9 million pounds of NH<sub>3</sub>-N being removed over the course of 10 years at an average cost of \$28 per pound of NH<sub>3</sub>-N removed. This is 41-fold higher than the costs reported by the Publicly Owned Treatment Works serving Decatur, Illinois; Bloomington, Illinois and Normal, Illinois in 2015 (<\$0.70 per pound of NH<sub>3</sub>-N removed). This is 21-fold higher than the median cost reported by 15 reporting entities in the 2015 survey conducted by the National Association of Clean Water Agencies (\$1.33 per pound of NH<sub>3</sub>-N removed).

In addition to the economical unreasonableness of this alternative, this alternative would increase the heat load to the Illinois River 10-fold which would adversely impact localized water quality. It would also greatly complicate utility and treatment plant operations.

Evaluation of Nitrification Alternatives for Emerald Henry, Illinois Facility

## Attachment A: Capital Cost Estimate

**Brown & Caldwell**

A-1

Use of contents on this sheet is subject to the terms and conditions set forth on the bottom of this sheet.



Startup, Training, O&M	1.5%	\$ 50,351.94
Subtotal		\$ 3,407,148
Contingency	25%	\$ 851,787.02
Subtotal		\$ 4,258,935
Builder's Risk, Liability Auto Insurance	2%	\$ 85,178.70
Subtotal		\$ 4,344,114
Bonds	1.5%	\$ 65,162
Subtotal		\$ 4,409,276
Engineering (Including Surveying)	15%	\$ 661,391
Subtotal		\$ 5,070,667
Project Management	4.0%	\$ 202,827
Subtotal		\$ 5,273,494
Grand Total		\$ 5,274,000
Low Range (-50%)		\$ 2,637,000
High Range (+100%)		\$ 10,548,000



Contingency	20%	\$ 3,038,264.59
Subtotal		\$ 18,229,588
Builder's Risk, Liability Auto Insurance	2%	\$ 364,591.75
Subtotal		\$ 18,594,179
Bonds	1.5%	\$ 278,913
Subtotal		\$ 18,873,092
Engineering (Including Surveying)	15%	\$ 2,830,964
Subtotal		\$ 21,704,056
Project Management	4.0%	\$ 868,162
Subtotal		\$ 22,572,218
Grand Total		\$ 22,573,000
Low Range (-50%)		\$ 11,286,500
High Range (+100%)		\$ 45,146,000

Evaluation of Nitrification Alternatives for Emerald-Henry, Illinois Facility

---

## **Attachment B: Block Flow Diagram (BFD)**

**Brown and Caldwell**

B-1

Use of records on this sheet is subject to the limitations specified at the beginning of this document  
E:\MS2018 Prod





**ATTACHMENT B**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
SOLID WASTE AND EMERGENCY  
RESPONSE

JUL 18 2007

Carolyn M. Brown, Esquire  
Greenebaum Doll & McDonald PLLC  
300 West Vine Street  
Suite 1100  
Lexington, KY 40507-1665

Dear Ms. Brown:

Thank you for your May 18, 2006 letter, on behalf of Ashland, Inc. (Ashland), in which you request clarification regarding the applicability of the Resource Conservation and Recovery Act (RCRA) regulatory program to a proposed spray irrigation system at Ashland's hazardous waste landfill located in Boyd County, Kentucky. Specifically, you ask that we clarify that the treated effluent permitted under Ashland's state National Pollutant Discharge Elimination System (NPDES) permit would be excluded from being a solid waste under 40 CFR 261.4(a)(2), even if a portion of the treated effluent is managed by spray irrigation to the cap of the hazardous waste landfill. (The regulation at 40 CFR 261.4(a)(2) excludes from the definition of solid waste wastewater discharges that are point source discharges subject to regulation under section 402 of the Clean Water Act (CWA).)

According to your letter, Ashland proposes to use the treated wastewater from the leachate collection system of the landfill for spray irrigation and maintenance of the landfill cap. The landfill leachate is classified as a listed hazardous waste with the hazardous waste code F039.

After reviewing the matter, we have determined that wastewater sprayed onto a landfill cap does not qualify for the Industrial Wastewater Discharge Exclusion under 40 CFR 261.4(a)(2). Although a portion of the effluent will continue to be discharged from Ashland's KPDES-permitted outfall to Chadwick Creek (and thus permitted under Section 402), wastewater that is diverted to land application and is not discharged to waters of the United States is not a point source discharge subject to regulation under the CWA and, therefore, does not qualify for the RCRA exclusion (even if it is part of the KPDES permit). Therefore, the wastewater remains a solid and hazardous waste. Unless it is delisted, the land application of this wastewater will constitute illegal disposal of hazardous waste. We believe a site-specific

Internet Address (URL) • <http://www.epa.gov>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

delisting, if granted, is the most appropriate action for removing the F039 hazardous waste code and allowing the proposed spray irrigation practice to occur.

Thank you for your inquiry regarding RCRA applicability to Ashland's proposed system. All inquiries regarding applicable permit requirements should be directed to Kentucky's Hazardous Waste Program. For other questions on this letter, please contact Jeff Gaines, at (703) 308-8655, or Ross Elliott, at (703) 308-8748.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Hale". The signature is fluid and cursive, written over a light background.

Matt Hale, Director  
Office of Solid Waste

cc: April Webb, KDEP  
John Jump, KDEP  
Bruce Scott, KDEP  
Jon Johnston, EPA, Region 4  
Kathy Nam, EPA, OGC  
Robert Dellinger, EPA, OSW  
Robert Hall, EPA, OSW

**GREENBAUM DOLL & McDONALD PLLC**

Michael E. Shelton*	Jane N. Kery	Mary C. Corva	Michael Houchens	H. Buckley Cole	Christie A. Moore	John Casner Whorlock	Shade L. Sprick	Edwin H. Perry
Ann M. Odom	Bruce E. Cryder	William L. Montague	Patrick R. Mortimer	Paul R. Whitty	Nancy J. Erbe	Todd H. Logsdon	G. Brian Walls	Thomas A. Bryan
Michael M. Robinson*	John W. Ames	Mark S. Riddis	Gregory E. Oberatto	Craig P. Simpson	Elizabeth S. Gray	Dorel W. Hueston, IV	Gregorio E. A. Vaca	John H. Strick, II
Philip D. Scott	Henry D. Raska	Philip C. Lachis	J. Mark Grady	Anna R. Clavett	W. Ashley Hess	Steven A. Rubin	William C. Yee, Jr	John S. Greenbaum
Wm. T. Robinson III	Barbara R. Hartung	Jillory A. Severice	Vicki Tilton Brown	Gregory R. School	Lynn R. Gussman	Kimberly H. Bryant	Matthew Hung	William C. Ballard, Jr.
Charles Fessler	Richard S. Chazy	Stephen W. Bantzer	Thomas J. Berthold	Kerim M. Deherty	Lari E. Krisko	Mark A. Loyd, Jr.	Matthew J. Burff	Martin J. Cunningham, III
John A. West	Carlynn M. Brown	Mark T. Hayden	John H. Oposchmidt	Charles R. Bantzer	Andrew J. Schaeffer	Jay W. Warren	Benjamin D. Alton	Lori Barlow Sullivan
Michael I. Aker	Janet P. Jahnemann	Patrick J. Walsh	John K. Bush	John F. Smith	Michael J. Blain	James W. Har	Peter L. Thurman	David L. Rice
W. Pierce Winborne, Jr	Margaret E. Kavan	John C. Barber	Amy R. Buge	Luann Dwyne	Emily Moore Dorcas	Raja J. Patel	Helen A. Theissen	Patricia W. Papp
Eric L. Lutz	Laura M. R. Jones, III	Luca E. Ebbog	Darlene T. Marsh	Michael W. Ferrigno, Jr	Britt A. Gardner	Founde S. Frey	Harold A. Kline	Glen D. Bellamy
John R. Combs	Mark H. Longmire	Michael H. Brown	James C. Evers, Jr.	D. Craig Duncan	Tate M. Harbord	Carie Shuffhouser	Sara H. Ivers	Ross D. Cohen
P. Richard Anderson, Jr.	Tandy C. Patrick	Gina A. Price, Jr.	Estevan P. Lord	Malissa M. Bar	Andrew D. Stamborg	Dana B. Martinez	Michael D. Donatroyer	Nicholas D. Donatroyer
James L. Bickner	Raymond J. Stewart	David E. Fisher	Steven R. Smith	Mike Kishin	Kari Tschir	Trevor T. Green	Sara H. Ivers	Sara H. Ivers
Charles J. Lynds	Henry C. T. Richmond, III	Philip J. Schwab	Lloyd R. Cross, Jr.	P. Elaine Grant	George D. Adams	Christopher W. D. Jones	Bradford O. Oso	Bradford O. Oso
Mark B. Amos	Carl W. Broadbent	David A. Owen	Neal R. Kaufman	Sara P. Redinger	Kelly A. Dent	Kari A. Schurhager	Michael A. Gorn	Michael A. Gorn
Blaise P. McGraw	C. Christopher Muth	Mark F. Kammer	Laural S. Oshary	Ann Yasi Karolakis	Benjamin J. Evans	W. Edward Kline	OF COUNSEL	OF COUNSEL
John D. Turac, III	Stephen E. Gilan	Robert O. Hudson	Robert L. Brown	Andrew M. Fluckman	Jillory L. Gehring	Jesse A. Mead	A. Robert Osh	A. Robert Osh
Wren D. Lyndup	Holland R. McIntyre V		Wesley L. Bryant Backe	Erin M. Johnson	Theodore R. Martin	Susan J. Hume	Robert F. Matthews	Robert F. Matthews
Fredy B. Lyndup					F. Maria Shafiq	James M. Dickerson, Jr.		

May 18, 2006

**Matt Hale**  
 Director, Office of Solid Waste (5301 W)  
 U.S. Environmental Protection Agency  
 1200 Pennsylvania Avenue, N.W.  
 Washington, D.C. 20460

Re: **Applicability of Industrial Wastewater  
 Discharge Exclusion**

Dear Mr. Hale:

Our firm represents Ashland Inc. (Ashland) which is the owner/operator and permittee for the Route 3 Landfill in Boyd County, Kentucky. Ashland operated the Route 3 Landfill for disposal of hazardous and nonhazardous wastes from Ashland's Catlettsburg Refinery complex. Closure of the landfill was completed in October 2000. Postclosure monitoring was instituted after completion of closure, and the Kentucky Division of Waste Management issued RCRA Postclosure Permit No. KYD-000-615-898 for the landfill in May 2005. The purpose of this letter is to obtain clarification from your office as to the applicability of the RCRA regulatory program to a proposed spray irrigation system for maintenance of the landfill cap. The spray irrigation system will be covered by the Kentucky Pollutant Discharge Elimination System (KPDES) permit for the landfill as explained in more detail below.

**A. Background**

The Route 3 Landfill has an extensive leachate collection system including sumps. The collection lines combine and discharge to a concrete wastewater treatment tank (WWTU). The influent from the leachate collection system is classified as F039 multi-source leachate. While in

GREENEBAUM DOLL & McDONALD PLLC

Matt Hale  
May 18, 2006  
Page 2

the tank, this wastewater is treated by sedimentation and aeration. In addition, a granulated activated carbon treatment system is brought on-site to polish the accumulated wastewater prior to periodic discharge to the KPDES-permitted outfall. There is also a separate treatment system for water (precipitation) collected by an underdrainage system. Both wastewater streams are treated and discharged to Chadwick Creek, pursuant to KPDES Permit No. KY0063096.

When the KPDES permit was renewed in 2005, different limitations were imposed. Ashland has discussed with the Divisions of Water and Waste Management possible amendment of the KPDES permit to allow use of the treated wastewater in a spray irrigation system for landfill cap maintenance during appropriate weather conditions while also continuing to allow discharge of the wastewater to Chadwick Creek. Ashland has undertaken extensive analysis of the wastewater as part of its evaluation of spray irrigation as an option. Testing has shown that the treated effluent is typically non-detect for F039 constituents that would be associated with the facility. In fact, ammonia appears to be the constituent that presents the greatest challenge for continued compliance with the KPDES permit -- of course, the ammonia in the effluent also makes it a good choice for cap maintenance. Although this approach would have environmental benefits in terms of reducing discharges to the creek and promoting healthy vegetation on the cap in lieu of fertilizer applications, a question has arisen as to whether the treated wastewater that is pumped from the WWTU and applied to the cap by the spray irrigation equipment may permissibly be considered excluded from the definition of solid (and thus, hazardous) waste pursuant to 40 CFR 261.4(a)(2). At a meeting in April with representatives of the Divisions and Ashland, it was decided that Ashland would submit this request in order to obtain clarification from EPA on the applicability of the exclusion for industrial wastewater discharges in this situation.

B. Regulatory Provisions

The wastewater collected in the WWTU has been classified as multi-source leachate, which is a listed hazardous waste with waste code F039.<sup>1</sup> However, 40 CFR 261.4(a) identifies certain materials which are not classified as a solid wastes and thus would not be hazardous wastes. Pursuant to 40 CFR 261.4(a)(2), the following are not classified as solid waste:

Industrial wastewater discharges that are point source discharges subject to regulation under section 402 of the Clean Water Act, as amended.

[*Comment:* This exclusion applies only to the actual point source discharge. It does not exclude industrial wastewaters while they are being collected, stored or

---

<sup>1</sup> Ashland has considered seeking to delist the wastewater based on analyses obtained to date which typically are non-detect for the constituents of concern.

GREENEBAUM DOLL & McDONALD PLLC

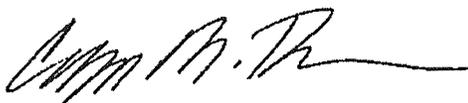
Matt Hale  
May 18, 2006  
Page 3

treated before discharge, nor does it excluded sludges that are generated by industrial wastewater treatment.]

The Environmental & Public Protection Cabinet, Division of Water has been delegated authority to implement the National Pollutant Discharge Elimination System (NPDES) permitting program under Section 402 of the Clean Water Act (known as the KPDES permit program in Kentucky). As stated above, Ashland presently holds KPDES Permit No. KY0063096 for discharges of treated wastewater to Chadwick Creek. Ashland intends to seek modification of the KPDES permit to add spray irrigation as a means of managing a portion of the wastewater from the landfill as an alternative to discharge to the creek. The spray irrigation would be strictly controlled to assure that appropriate amounts were applied. The wastewater will not be able to percolate into the closed landfill due to the liner that was part of the final cap design. Ashland requests confirmation from EPA that the wastewater at the point of application from the spray irrigation system would no longer be classified as hazardous waste provided that the spray irrigation is included in the KPDES permit. Having completed closure of the landfill, Ashland obviously wants to avoid inadvertently triggering any additional hazardous waste management requirements as a result of implementation of this proposed wastewater management option.

If you have any questions regarding this letter, please do not hesitate to call. We appreciate your attention to this inquiry.

Sincerely yours,



Carolyn M. Brown

CMB/cab

cc: John G. Horne, Esq., KDEP General Counsel  
April Webb, Kentucky Division of Waste Management  
Dale Burton, Kentucky Division of Waste Management  
Jory Becker, Kentucky Division of Water  
Nigel Goulding  
Joseph A. French, Esq.

# **EXHIBIT 7**



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

CERTIFIED MAIL: 7010 3090 0003 0728 0020

September 23, 2011

Illinois Environmental Protection Agency  
Bureau of Water  
Compliance Assurance Section  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

Re: NPDES Biomonitoring Results- NPDES Permit No. IL0001392-1

Dear Sirs:

In accordance with special condition number 14 of NPDES permit No. IL0001392-1 issued to Emerald Performance Materials and PolyOne Corporation, attached please find the analytical results of the sampling completed in accordance with the letter from Emerald Performance Materials (Mr. Mike Strabley) to your office dated April 16, 2011. Analytical results for the biomonitoring samples scheduled to be collected in October 2011 and January 2012 will be submitted within one week of receipt from the analytical laboratory.

If you have any questions or need addition information, please contact Jim Hastings at (309)364-9479 or myself at (330) 916-6701.

Sincerely,  
EMERALD PERFORMANCE MATERIALS, LLC

A handwritten signature in black ink that reads "Brenda Abke". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Brenda Abke  
Director, HSE&S

Attachments: PDC Laboratories, Inc. Analytical Data Report dated 07/15/11 (sample #1061342-01)  
PDC Laboratories, Inc. Analytical Data Report dated 08/31/11 (sample #1072876-01 and  
1072876-02)

cc: Jim Hastings, General Foreman, Emerald Performance Materials, Henry IL  
Todd Huson, IEPA-Regional Office  
John McKinley, PolyOne Corporation, Henry IL



**PDC Laboratories, Inc.**  
P.O. Box 9071 • Peoria, IL 61612-9071  
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



**Emerald Performance Materials**  
1550 County Rd 1450 N  
Henry, IL 61537  
Attn: Jim Hastings

Date Received: 06/14/11 8:15  
Report Date: 07/15/11  
Customer #: 202011  
PO#: HE-40014063-UB

Sample No: 1061342-01  
Sample Description: PLANT

Collect Date: 06/13/11 17:30  
Matrix: Waste Water Grab

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b>Miscellaneous - Environmental Analysis South</b>					
WET Testing Single Dilution - subcontracted	See Attached		06/15/11 00:00	Subco	Subcontracted



**PDC Laboratories, Inc.**  
P.O. Box 9071 • Peoria, IL 61612-9071  
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
1550 County Rd 1450 N  
Henry, IL 61537  
Attn: Jim Hastings

Date Received: 06/14/11 8:15  
Report Date: 07/15/11  
Customer #: 202011  
PO#: HE-40014063-UB

### Notes

This report shall not be reproduced, except in full, without the written approval of the laboratory.

PDC Laboratories participates in the following accreditation/certification and proficiency programs at the following locations. Endorsement by Federal or State Governments or their agencies is not implied.

- PIA PDC Laboratories - Peoria, IL  
NELAC Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
Drinking Water Certifications: Kansas (E-10338); Missouri (870); Wisconsin (998284430); Indiana (C-IL-040); Iowa (240)  
Wastewater Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
Hazardous/Solid Waste Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
UST Certification; Iowa (240)
- SPM PDC Laboratories - Springfield, MO  
EPA DMR-QA Program
- STL PDC Laboratories - St. Louis, MO  
NELAC Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS EPA Lab No. E-10389

A handwritten signature in cursive script, appearing to read "Kurt Stepling".

Certified by: Kurt C. Stepling, Senior Project Manager

CHAIN OF CUSTODY RECORD

PDC LABORATORIES, INC.  
 2231 WEST ALTOFFER DRIVE  
 PEORIA, IL 61615  
 PHONE # 800-752-6651  
 FAX # 309-692-9689

States where samples collected

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT) - (SAMPLE ACCEPTANCE POLICY ON REVERSE)

<p>1 CLIENT NAME: <b>EMERALD PERFORMANCE</b></p> <p>ADDRESS: <b>1550 CLIFTON</b></p> <p>CITY: <b>HENRY, IL</b></p> <p>STATE: <b>IL</b></p> <p>ZIP: <b>61860</b></p> <p>CONTACT: <b>MIKE STABELY</b></p>		<p>2 PROJECT NUMBER: _____</p> <p>PHONE NUMBER: _____</p> <p>FAX NUMBER: _____</p>		<p>3 MEANS SHIPPED: <b>CONVEYER</b></p> <p>DATE SHIPPED: <b>6/14/11</b></p> <p>MARKING TYPES: _____</p> <p>REMARKS: _____</p>		<p>4 (FOR LAB USE ONLY)</p> <p>LOGGED BY: _____</p> <p>LAB PROJ. # _____</p> <p>TEMPLATE: _____</p> <p>PHONE MARK: _____</p>	
<p>5 TURNAROUND TIME REQUESTED PLEASE CIRCLE (FRESH IS SUBJECT TO PDC-DATA NETWORK AND SUPPORTERS)</p> <p>PHONE # _____</p> <p>FAX # _____</p> <p>EMAIL ADDRESS: _____</p>		<p>6 DATE RESULTS NEEDED: _____</p> <p>PHONE: _____</p> <p>EMAIL: _____</p>		<p>7 (FOR LAB USE ONLY)</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p>		<p>8 (FOR LAB USE ONLY)</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p>	
<p>9 WET TESTING</p> <p>* plant</p> <p>* level 160</p>		<p>10 WU 2</p>		<p>11 REMARKS</p>		<p>12 (FOR LAB USE ONLY)</p> <p>DATE: _____</p> <p>TIME: _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p> <p>RECEIVED BY (SIGNATURE): _____</p>	

Copies: white should accompany samples to PDC Labs. Yellow copy to be retained by the client.

**PDC LABORATORIES, INC.**  
 2231 WEST ALTORFER DRIVE  
 PEORIA, IL 61615  
 PHONE # 309-692-9688  
 FAX # 309-692-9589

**CHAIN OF CUSTODY RECORD**

State where samples collected IL

ALL UNPRINTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

CLIENT: <b>EMERALD MATERIALS</b> ADDRESS: <b>RR 1 BOX 15</b> CITY: <b>HENRY, IL</b> STATE: <b>IL</b> ZIP:		PROJECT NUMBER:	ANALYTES REQUESTED:	(FOR LAB USE ONLY) LOGS: <u>106342-01</u> LAB PROBLEMS: TEMPERATURE: <b>RECORD DAY</b> PROBLEMS: <b>BAK</b> REMARKS:
CONTRACT PERSON: <b>JIM HASTINGS</b>	DATE COLLECTED:	DATE SHIPPED:	COMMENTS FOR LAB USE ONLY:	
SAMPLE DESCRIPTION AS YOU WANT ON REPORT:	SAMPLE TYPE:	MATRIX TYPE:	SAMPLE TEMPERATURE UPON RECEIPT:	
PRIMARY EFFLUENT	DATE COLLECTED: <b>6-16-11</b>	DATE SHIPPED: <b>6-16-11</b>	CHECK PROTECT SAMPLES FROM TOXICITY:	
PLANT EFFLUENT	DATE COLLECTED: <b>6-16-11</b>	DATE SHIPPED: <b>6-16-11</b>	CHECK PROTECT SAMPLES FROM TOXICITY:	
<u>Plant Effluent</u>	DATE COLLECTED: <b>6-16-11</b>	DATE SHIPPED: <b>6-16-11</b>	CHECK PROTECT SAMPLES FROM TOXICITY:	
<u>Upstream River H2O</u>	DATE COLLECTED: <b>6-5-11</b>	DATE SHIPPED: <b>6-5-11</b>	CHECK PROTECT SAMPLES FROM TOXICITY:	

UNRECORDED THE ACQUIRED PARAMETER: NOMINAL - NONE  
 UNRECORDED THE ACQUIRED PARAMETER: FACILITY - NONE  
 UNRECORDED THE ACQUIRED PARAMETER: FACILITY - NONE  
 UNRECORDED THE ACQUIRED PARAMETER: FACILITY - NONE

RECEIVED BY: *[Signature]* DATE: **6-16-11** TIME: **0030**  
 RELEASED BY: *[Signature]* DATE: **6-16-11** TIME: **1245**

RECEIVED BY: *[Signature]* DATE: **6-16-11** TIME: **1245**  
 RELEASED BY: *[Signature]* DATE: **6-16-11** TIME: **1245**

SAMPLE TEMPERATURE UPON RECEIPT: **2**  
 CHECK PROTECT SAMPLES FROM TOXICITY: **2**

D:\gait\Public\COC\COC\_Emerald\_Daily.doc

# Environmental Analysis South, Inc.

4000 East Jackson Blvd • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING City of Emerald, IL Plant Effluent, AEC = 100%

EAS LOG# 1311712  
June 15, 2011 through June 19, 2011

### Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)  
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)  
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)  
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
  - 1.1. Data Summation
  - 1.2. Conclusion
2. Method Summation
  - 2.1. Test Conditions and Methods
  - 2.2. Potassium chloride Reference Salt Test
    - 2.2.1. *Pimephales promelas* data
    - 2.2.2. *Ceriodaphnia dubia* data
  - 2.3. Literature Cited
3. Raw Data Bench Sheets
  - 3.1. Initial observations (page 1)
  - 3.2. Zero hour Observations (page 1)
  - 3.3. Twenty-four (24) - Forty-eight (48) hour Observations (page 1)
  - 3.4. Seventy-two (72) - Ninety-six (96) hour Observations (page 2)
  - 3.5. Survival Data Table (page 3-4)
  - 3.6. Test Comments (page 5)
4. Chain of Custody

# Environmental Analysis South, Inc.

4000 East Jackson Blvd · Jackson, MO 63755 · 573-204-8817 · Fax 573-204-8818



**REPORT OF ACUTE TOXICITY TESTING**  
 City of Emerald, IL  
 Plant Effluent, AEC = 100%

EAS LOG# 1311712  
 June 15, 2011 through June 19, 2011

**1. REPORT SUMMATION:**

**1.1. Multiple Dilution Data Summation**

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 96 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	90%	100%
12.5% Effluent	0%*	35%*
25% Effluent	0%*	0%*
50% Effluent	0%*	0%*
100% Effluent	0%*	0%*
<b>Estimated LC<sub>50</sub> Value</b>	8.50% Effluent	11.27% Effluent

\* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

**Conclusion:**

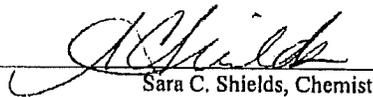
*Pimephales promelas* 96 hour WET results:

LC 50 = 8.50% using Trimmed Spearman-Kärber  
 NOAEC = 6.25% using Steel's Many-One Rank Test

*Ceriodaphnia dubia* 48 hour WET results:

LC 50 = 11.27% using Trimmed Spearman-Kärber  
 NOAEC = 6.25% using Steel's Many-One Rank Test

Approved by \_\_\_\_\_

  
 Sara C. Shields, Chemist

## Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



**REPORT OF ACUTE TOXICITY TESTING**  
 City of Emerald, IL  
 Plant Effluent, AEC = 100%

EAS LOG# 1311712  
 June 15, 2011 through June 19, 2011

**2. TEST METHOD SUMMARY****2.1. TEST CONDITIONS AND METHODS:**

	<i>Ceriodaphnia dubia:</i>	<i>Pimephales promelas:</i>
Test duration:	48 hours	96 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18<sup>th</sup> edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.

## Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



### REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL  
Plant Effluent, AEC = 100%

EAS LOG# 1311712

June 15, 2011 through June 19, 2011

#### 2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on June 8, 2011 using KCL Lot #41713. Following are the results:

2.2.1. *P. promelas* - 48 hr. Acute Test –  $LC_{50} = 1.071$  g/l 95%CI (0.736-1.405 g/l)

EAS %CV = 15.6%

National Warning Limits (75<sup>th</sup> percentile) = 19%CV

National Control Limits (90<sup>th</sup> percentile) = 33%CV

2.2.2. *C. dubia* - 48 hr. Acute Test –  $LC_{50} = 0.467$  g/l 95%CI (0.303-0.631g/l)

EAS %CV = 17.5%

National Warning Limits (75<sup>th</sup> percentile) = 29%CV

National Control Limits (90<sup>th</sup> percentile) = 34%CV

#### 2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System*, (Table B-2). June 2000. EPA 833-R-00-003.

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: City of Emerald, IL (Plant)

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: 06/13/11 1730 hrs

DATE & TIME OF SUBMISSION: 06/15/11 1030 hrs by UPS

Upstream: River

Collected: 06/13/11 1730 hrs

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC
LOG NUMBER / ID NUMBER						1311712	1311712A	4014
pH - SU	06/15/11	1045 hrs	SCS	SB114 (8.8-9.2)	9.08	7.68	7.60	7.93
TEMPERATURE °C RECEIVED	06/15/11	1045 hrs	SCS	EAS 106		2	3	24
SPECIFIC CONDUCTANCE umhos	06/15/11	1045 hrs	SCS	ERA P185-506(359-407)	388	12730	546	239
HARDNESS - ppm	06/15/11	1045 hrs	SCS	ERA P170-507(107-134)	120	280	200	80
CHLORINE - ppm	06/15/11	1045 hrs	SCS	tap water	+	<0.04	<0.04	<0.04
DISSOLVED OXYGEN - ppm	06/15/11	1045 hrs	SCS	cal@840		6	7.6	8.3
TOTAL ALKALINITY - ppm	06/15/11	1230 hrs	SCS	ERA P185-506(70.8-83.7)	74.4	406	141	61.7
INITIAL AMMONIA - ppm	06/21/11	1245 hrs	JPC	EAS #1981 (8-12)	10.4	85	0.087	<0.050
TOTAL DISSOLVED SOLIDS - ppm								

0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/15/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.08	7.96	7.95	7.76	7.83	7.90	7.94	7.96	
TEMPERATURE °C	06/15/11	1100 hrs	SCS	EAS 106		24.4	23.6	23.7	23.6	24.5	24.5	23.6	
SPECIFIC CONDUCTANCE umhos	06/15/11	1100 hrs	SCS	ERA P185-506(359-407)	388	240	546	12340	6260	3690	2090	1326	
DISSOLVED OXYGEN - ppm	06/15/11	1100 hrs	SCS	cal@840		7.7	9.0	7.8	8.7	8.9	9.1	9.0	

24 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/16/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.06	7.66	8.40	8.30	8.37	8.40	8.41	8.42	
TEMPERATURE °C	06/16/11	1100 hrs	SCS	EAS 106		24.4	24.4	24.4	24.4	24.4	24.4	24.4	
SPECIFIC CONDUCTANCE umhos	06/16/11	1100 hrs	SCS	ERA P185-506(359-407)	393	267	549	12070	6590	3670	2100	1312	
DISSOLVED OXYGEN - ppm	06/16/11	1100 hrs	SCS	cal@840		7.6	7.7	7	7.4	7.8	7.8	7.9	

48 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/17/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.95	7.61	8.34	8.52	8.51	8.39	8.41	8.38	
TEMPERATURE °C	06/17/11	1100 hrs	SCS	EAS 106		24.4	24.4	24.4	24.4	24.4	24.4	24.4	
SPECIFIC CONDUCTANCE umhos	06/17/11	1100 hrs	SCS	ERA P185-506(359-407)	371	265	552	12130	6580	3680	2120	1315	
DISSOLVED OXYGEN - ppm	06/17/11	1100 hrs	SCS	cal@840		7.5	7.1	7.1	6.9	6.9	7.1	6.9	
FINAL AMMONIA - ppm													

24 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/16/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.06	8.00	8.53	8.56	8.57	8.57	8.57	8.55	
TEMPERATURE °C	06/16/11	1100 hrs	SCS	EAS 106		24.4	24.4	24.4	24.4	24.4	24.4	24.4	
SPECIFIC CONDUCTANCE umhos	06/16/11	1100 hrs	SCS	ERA P185-506(359-407)	394	253	534	12100	6440	3640	2080	1289	
DISSOLVED OXYGEN - ppm	06/16/11	1100 hrs	SCS	cal@840		7.9	8.1	8.3	8.3	8.3	8.2	8.2	

48 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/17/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.95	8.60	8.52	8.72	8.70	8.64	8.59	8.57	
TEMPERATURE °C	06/17/11	1100 hrs	SCS	EAS 106		24.4	24.4	24.4	24.4	24.4	24.4	24.4	
SPECIFIC CONDUCTANCE umhos	06/17/11	1100 hrs	SCS	ERA P185-506(359-407)	371	268	540	11900	6420	3610	2070	1282	
DISSOLVED OXYGEN - ppm	06/17/11	1100 hrs	SCS	cal@840		7.5	8.1	7.6	7.9	7.8	7.8	8.1	
FINAL AMMONIA - ppm													

Page 9 of 15

Approved by: *[Signature]*

Date: 06/30/2011

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: City of Emerald, IL (Plant)

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: 06/16/11 0030 hrs by City of Emerald

DATE & TIME OF SUBMISSION: 06/17/11 1030 hrs by UPS

Upstream: River  
Collected: 06/15/11 1900 hrs by City of Emerald

LOG NUMBER / ID NUMBER	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC					
pH - SU	06/17/11	1045 hrs	JPC	SB114 (8.8-9.2)	8.95	1311920	1311920A	RC4014					
TEMPERATURE °C RECEIVED	06/17/11	1045 hrs	JPC	EAS 106		7.61	7.76	7.93					
SPECIFIC CONDUCTANCE umhos	06/17/11	1045 hrs	JPC	ERA P185-506(359-407)	371	1	1	24					
HARDNESS - ppm	06/17/11	1045 hrs	JPC	ERA P170-507(107-134)	120	13330	624	239					
CHLORINE - ppm	06/17/11	1045 hrs	JPC	tap water	+	340	260	80					
DISSOLVED OXYGEN - ppm	06/17/11	1045 hrs	JPC	cal@840		<.04	<.04	<0.04					
TOTAL ALKALINITY - ppm	06/22/11	1200 hrs	SCS	Q029-506 (35.4-48.1)	37.6	6.7	7.1	8.3					
INITIAL AMMONIA - ppm	06/21/11	1245 hrs	JPC	EAS #1981 (8-12)	10.4	460	148	52.8					
TOTAL DISSOLVED SOLIDS -ppm						88.8	<0.050	<0.050					
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/17/11	1200 hrs	SCS	SB114 (8.8-9.2)	8.95	8.02	8.06				7.96	8.00	
TEMPERATURE °C	06/17/11	1200 hrs	SCS	EAS 106		24.2	24.2				24.2	24.2	
SPECIFIC CONDUCTANCE umhos	06/17/11	1200 hrs	SCS	ERA P185-506(359-407)	371	263	621				2370	1464	
DISSOLVED OXYGEN - ppm	06/17/11	1200 hrs	SCS	cal@840		7.3	7.9				7.7	7.5	
72 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/18/11	1200 hrs	SCS	SB114 (8.8-9.2)	9.07	7.57	8.06						
TEMPERATURE °C	06/18/11	1200 hrs	SCS	EAS 106		24.2	24.2				8.30	8.18	
SPECIFIC CONDUCTANCE umhos	06/18/11	1200 hrs	SCS	ERA P185-506(359-407)	370	255	621				24.2	24.2	
DISSOLVED OXYGEN - ppm	06/18/11	1200 hrs	SCS	cal@840		7.9	7.9				2430	1484	
96 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	06/19/11	1200 hrs	SCS	SB114 (8.8-9.2)	9.07	7.72	8.31						
TEMPERATURE °C	06/19/11	1200 hrs	SCS	EAS 106		24.4	24.4				8.45	8.35	
SPECIFIC CONDUCTANCE umhos	06/19/11	1200 hrs	SCS	ERA P185-506(359-407)	399	261	641				24.4	24.4	
DISSOLVED OXYGEN - ppm	06/19/11	1200 hrs	SCS	cal@840		7.6	7.6				2440	1491	
FINAL AMMONIA - ppm											7.5	7.6	

Page 10 of 15

Approved by: *[Signature]*

Date: 06/30/2011

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1311712

Date Test Began: June 15, 2011

Time Test Began: 1100 hrs

Analyst 1: DFW

Date Test Finished: 06/19/11PP&06/17/11CD

Time Test Finished: 1200 hrs

Analyst 2: KJR

Analyst 3: SCS

P. promelas (PP)

AGE: 5 days

HATCH NUMBER: 8636 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	0,0	0,0	0,0	10,10	10,10	
48 HR-PP	10,10	10,10	0,0	0,0	0,0	1,0	10,10	

Ceriodaphnia dubia (CD)

AGE: <24 hours

HATCH NUMBER: 2338 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE						
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	5,2,5,2	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	0,0,0,0	3,1,0,3	5,5,5,5	

Page 11 of 15

Approved by: *J. Chalk*

Date: 06/30/2011

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1311712

Date Test Began: June 15, 2011

Time Test Began: 1100 hrs

Analyst 1: DFW

Date Test Finished: 06/19/11PP&06/17/11CD

Time Test Finished: 1200 hrs

Analyst 2: KJR

Analyst 3: SCS

P. promelas (PP)

AGE: 5 days

HATCH NUMBER: 8636 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
48 HR-PP	10,10	10,10	0,0	0,0	0,0	1,0	10,10	
72 HR-PP	10,10	10,10	0,0	0,0	0,0	1,0	10,10	
96 HR-PP	10,10	10,10	0,0	0,0	0,0	0,0	9,9	


Approved by: *[Signature]*

Date: 06/30/2011



*Multiple  
9/10/11, IL*

*11366*

**SUBCONTRACT ORDER**  
**PDC Laboratories, Inc.**  
**1061342**

**SENDING LABORATORY:**

PDC Laboratories, Inc.  
 2231 W. Altorfer Drive  
 Peoria, IL 61615  
 Project Manager: Kurt C. Stepping  
 kstepping@pdclab.com Phone: 309-683-1719

**RECEIVING LABORATORY:**

Environmental Analysis South  
 4000 East Jackson Blvd  
 Jackson, MO 63755  
 Phone :573-204-8817

Sample Origin (State) IL  
 PO# L 70681

Analysis	Due	Expires	Comments
Sample ID: 1061342-01 01-Wet Single	Water 06/24/11 16:00	Sampled:06/13/11 17:30 06/15/11 17:30	<i>Plant #1811712 temp rec'd = 32</i> Sc
Sample ID: 1061342-02 01-Wet Single	Water 06/24/11 16:00	Sampled:06/13/11 17:30 06/15/11 17:30	<i>River #1811712 A temp rec'd = 32</i> SS

Relinquished By <i>W. J. Dwyer</i>	Date/Time <i>6-14-11 10:00</i>	Received By	Date/Time	Sample Temperature Upon Receipt	___ C
<i>[Signature]</i>		<i>[Signature]</i>	<i>6/15/11</i>	Sample(s) Received on Ice	Y or N
Relinquished By	Date/Time	Received By	Date/Time	Proper Bottles Received in Good Condition	Y or N
		<i>[Signature]</i>	<i>6/15/11</i>	Bottles Filled with Adequate Volume	Y or N
		<i>1030 UPS</i>		Samples Received Within Hold Time	Y or N
				Date/Time Taken From Sample Bottle	Y or N

*renewal  
for 1311712*

**SUBCONTRACT ORDER**

**PDC Laboratories, Inc.  
1061342**

**SENDING LABORATORY:**

PDC Laboratories, Inc.  
2231 W. Altorfer Drive  
Peoria, IL 61615  
Project Manager: Kurt C. Stepping  
kstepping@pdclab.com Phone: 309-683-1719

**RECEIVING LABORATORY:**

Environmental Analysis South  
4000 East Jackson Blvd  
Jackson, MO 63755  
Phone :573-204-8817

Sample Origin (State) IL  
PO# L. T. Co. 1

Analysis	Due	Expires	Comments
Sample ID: 1061342-01 01-Wet Single	Water 06/24/11 16:00	Sampled:06/13/11 17:30 06/15/11 17:30	<i>Sent 6-14-11</i>
Sample ID: 1061342-02 01-Wet Single	Water 06/24/11 16:00	Sampled:06/13/11 17:30 06/15/11 17:30	<i>Sent 6-14-11</i>
Sample ID: 1061342-03 01-Wet Single	Water 06/24/11 16:00	Sampled:06/16/11 00:30 06/18/11 00:30	<i>Plant #1311920 temperature = 10°C</i> <i>(SCD)</i>
Sample ID: 1061342-04 01-Wet Single	Water 06/24/11 16:00	Sampled:06/16/11 19:00 06/17/11 19:00	<i>Upstream #1311920-A</i> <i>temperature = 10°C</i> <i>S/S</i>

Relinquished By	Date/Time	Received By	Date/Time	Sample Temperature Upon Receipt	<u>1.3 C</u>
<i>William J. Hoyle</i>	<i>6-16-11 13:52</i>	<i>Amulgan</i>	<i>6/17/11</i>	Sample(s) Received on Ice	<input checked="" type="radio"/> Y <input type="radio"/> N
				Proper Bottles Received in Good Condition	<input checked="" type="radio"/> Y <input type="radio"/> N
				Bottles Filled with Adequate Volume	<input checked="" type="radio"/> Y <input type="radio"/> N
				Samples Received Within Hold Time	<input checked="" type="radio"/> Y <input type="radio"/> N
				Date/Time Taken From Sample Bottle	<input checked="" type="radio"/> Y <input type="radio"/> N



**PDC Laboratories, Inc.**  
 P.O. Box 9071 • Peoria, IL 61612-9071  
 (309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
 1550 County Rd 1450 N  
 Henry, IL 61537  
 Attn: Jim Hastings

Date Received: 07/26/11 11:49  
 Report Date: 08/31/11  
 Customer #: 202011  
 PO#: HE-40014063-UB

Sample No: 1072876-01  
 Sample Description: UPSTREAM

Collect Date: 07/25/11 16:00  
 Matrix: Waste Water Regular Sample

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	1		07/25/11 00:00	Subco	Subcontracted

Sample No: 1072876-02  
 Sample Description: EFFLUENT

Collect Date: 07/25/11 16:00  
 Matrix: Waste Water Regular Sample

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	1		07/25/11 00:00	Subco	Subcontracted



**PDC Laboratories, Inc.**  
P.O. Box 9071 • Peoria, IL 61612-9071  
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
1550 County Rd 1450 N  
Henry, IL 61537  
Attn: Jim Hastings

Date Received: 07/26/11 11:49  
Report Date: 08/31/11  
Customer #: 202011  
PO#: HE-40014063-UB

### Notes

This report shall not be reproduced, except in full, without the written approval of the laboratory.

PDC Laboratories participates in the following accreditation/certification and proficiency programs at the following locations. Endorsement by Federal or State Governments or their agencies is not implied.

- PIA PDC Laboratories - Peoria, IL  
NELAC Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
Drinking Water Certifications: Kansas (E-10338); Missouri (870); Wisconsin (998284430); Indiana (C-IL-040); Iowa (240)  
Wastewater Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
Hazardous/Solid Waste Certifications; Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
UST Certification; Iowa (240)
- SPM PDC Laboratories - Springfield, MO  
EPA DMR-QA Program
- STL PDC Laboratories - St. Louis, MO  
NELAC Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS EPA Lab No. E-10389

WET analysis subcontracted, report attached.

A handwritten signature in black ink, appearing to read "Kurt Stepping".

Certified by: Kurt C. Stepping, Senior Project Manager



**ENVIRONMENTAL ANALYSIS SOUTH, INC.**

4000 East Jackson Blvd  
Jackson, MO 63755  
Phone: (573) 204-8817 Fax: (573) 204-8818



**WHOLE EFFLUENT TOXICITY TESTING  
CHAIN OF CUSTODY**

CLIENT: PDC - Emerald

NPDES PERMIT NUMBER: IL 0001392

EFFLUENT NAME: \_\_\_\_\_ (LEGAL NAME) GRAB  24 HR COMPOSITE

COLLECTION DATA: START DATE: 7/25 START TIME: 1800 0000

FINISH DATE: 7/25 FINISH TIME: 1600

UPSTREAM NAME: ILLINOIS RIVER (LEGAL NAME) (GRAB SAMPLE)

COLLECTION DATA: DATE: 7/25/11 TIME: 1600

SAMPLER NAME: MIKE STRABLEY (PRINT NAME) CARRIER: \_\_\_\_\_

Disclaimer: Environmental Analysis South, Inc. shall not be held financially liable for invalid whole effluent toxicity test (WET) or shipping charges resulting from the following reasons:  
• Sampling & holding time errors (Will result in a setup charge of \$100 to the client)  
• Commercial carrier delivery problems or errors (Will result in a setup charge of \$100 to the client)  
• Problems with health or delivery of test organisms by vendor (No setup charge to client)

**SAMPLER CHECK LIST**  
NO HEADSPACE IN BOTTLES   
SAMPLER BY NEXT DAY CARRIER OR DELIVER TO LAB ON 7-26-11  
SAMPLES TO BE HAND DELIVERED TO LABORATORY SAME DAY AS TEST SETUP   
SUFFICIENT ICE TO COOL SAMPLES TO A RANGE OF 0-4°C WHEN SHIPPING OVERNIGHT   
RELINQUISHED BY: [Signature] DATE: 7-26-11 TIME: [Signature]

**LABORATORY USE ONLY**  
**EFFLUENT** LOG NUMBER: \_\_\_\_\_  
RECEIVED TEMPERATURE: \_\_\_\_\_ °C THERMOMETER ASSIGNED NUMBER: \_\_\_\_\_  
HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST  
**UPSTREAM** LOG NUMBER: \_\_\_\_\_  
RECEIVED TEMPERATURE: \_\_\_\_\_ °C THERMOMETER ASSIGNED NUMBER: \_\_\_\_\_  
HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST  
RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

<b>SHIPPING ORDER</b> AUTHORIZED BY: Mike Strabley PURCHASING DEPT. APPROVAL: 7-20-11 DATE ENTERED: 7-20-11 PLANT LOCATION: HENRY		OUR PURCHASE ORDER NO.: HE-40007840 SHIPPED FROM: HENRY, IL 61537 SOLD TO: PDC Lab		Emerald Performance Materials 1550 County Road 1450 N. Henry, IL 61537 YOUR INVOICE NO.: YOUR INVOICE DATE:		SHIPPING ORDER NUMBER: P19-110282 PLEASE USE THE ABOVE NUMBER WHEN CORRESPONDING BILL OF LADING NUMBER: D.S.D. # REPORT NUMBER: CHECKED BY: <i>[Signature]</i>	
DATE SHIPPED: 7-20-11 TIME: 11:00 AM BOX NO:		SHIP VIA: <input type="checkbox"/> PREP/D <input type="checkbox"/> COLLECT Box No:		GROSS WT: REQUIRED DELIVERY DATE: VALUE PER 100K: Lab Ref:		THIS IS TO VERIFY THAT THE ABOVE LISTED MATERIALS ARE PROPERLY CLASSIFIED, PACKAGED, LABELED, AND MARKED IN ACCORDANCE WITH THE REQUIREMENTS OF THE DOT AND IATA.	
HAZARDOUS: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, GIVE ADDITIONAL INFORMATION BELOW:		DESCRIPTIONS: WET TESTING SAMPLES 2 BAGS		DENSITY:		PRICE:	
Primary Effluent Plant Effluent		Primary Effluent Plant Effluent		DENSITY:		PRICE:	
CONTAINERS - RETURNED FOR CREDIT: <input type="checkbox"/> SALES OF PROPERTY: <input type="checkbox"/> LOAN OF PROPERTY: <input type="checkbox"/> SAMPLE FOR EVALUATION: <input checked="" type="checkbox"/>		INSTRUCTIONS TO VENDOR:		DENSITY:		PRICE:	
MATERIAL REQUESTED BY: Name:		DATA RECEIVED:		DENSITY:		PRICE:	

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL  
Plant Effluent, AEC = 100%

EAS LOG# 1314124  
July 27, 2011 through July 29, 2011

### Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)  
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)  
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)  
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
  - 1.1. Data Summation
  - 1.2. Conclusion
2. Method Summation
  - 2.1. Test Conditions and Methods
  - 2.2. Potassium chloride Reference Salt Test
    - 2.2.1. *Pimephales promelas* data
    - 2.2.2. *Ceriodaphnia dubia* data
  - 2.3. Literature Cited
3. Raw Data Bench Sheets
  - 3.1. Initial observations (page 1)
  - 3.2. Zero hour Observations (page 1)
  - 3.3. Twenty-four (24) - Forty-eight (48) hour Observations (page 1)
  - 3.4. Seventy-two (72) – Ninety-six (96) hour Observations (page 2)
  - 3.5. Survival Data Table (page 3-4)
  - 3.6. Test Comments (page 5)
4. Chain of Custody

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL  
Plant Effluent, AEC = 100%

EAS LOG# 1314124  
July 27, 2011 through July 29, 2011

### 1. REPORT SUMMATION:

#### 1.1. Multiple Dilution Data Summation

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 48 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Reconstituted Control + Sodium Thiosulfate (RCT)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	95%	100%
12.5% Effluent	0%*	50%*
25% Effluent	0%*	0%*
50% Effluent	0%*	0%*
100% Effluent	0%*	0%*
Estimated LC <sub>50</sub> Value	8.68% Effluent	12.50% Effluent (10.71% - 14.60%)

\* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

#### Conclusion:

*Pimephales promelas* 48 hour WET results: LC 50 = 8.68% using Trimmed Spearman-Kärber  
NOAEC = 6.25% using Steel's Many-One Rank Test  
*Ceriodaphnia dubia* 48 hour WET results: LC 50 = 12.50% using Trimmed Spearman-Kärber  
NOAEC = 6.25% using Steel's Many-One Rank Test

**Note:** Per the method, test duration for the *Pimephales promelas* should have been 96 hrs. However, due to UPS failure to deliver the renewal effluent, the test was terminated at 48 hours. These results were calculated using the 48 hour data.

Approved by \_\_\_\_\_

  
Sara C. Shields, Chemist

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING City of Emerald, IL Plant Effluent, AEC = 100%

EAS LOG# 1314124  
July 27, 2011 through July 29, 2011

### 2. TEST METHOD SUMMARY

#### 2.1. TEST CONDITIONS AND METHODS:

	<i>Ceriodaphnia dubia</i> :	<i>Pimephales promelas</i> :
Test duration:	48 hours	48 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18<sup>th</sup> edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL  
Plant Effluent, AEC = 100%

EAS LOG# 1314124  
July 27, 2011 through July 29, 2011

### 2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on July 6, 2011 using KCL Lot #41713. Following are the results:

- 2.2.1. *P. promelas* - 48 hr. Acute Test – LC<sub>50</sub> = 1.068 g/l 95%CI (0.7311-1.405 g/l)  
EAS %CV = 15.8%  
National Warning Limits (75<sup>th</sup> percentile) = 19%CV  
National Control Limits (90<sup>th</sup> percentile) = 33%CV
- 2.2.2. *C. dubia* - 48 hr. Acute Test – LC<sub>50</sub> = 0.463 g/l 95%CI (0.294-0.632g/l)  
EAS %CV = 18.3%  
National Warning Limits (75<sup>th</sup> percentile) = 29%CV  
National Control Limits (90<sup>th</sup> percentile) = 34%CV

### 2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2). June 2000. EPA 833-R-00-003.

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: City of Emerald, IL (Plant)

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: 07/27/11 1600 hrs by City of Emerald

DATE & TIME OF SUBMISSION: 07/27/11 1005 hrs by UPS

Upstream: River

Collected: 07/27/11 0710 hrs by Natalie Harris

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC					
LOG NUMBER / ID NUMBER						1314124	1314124A	4017					
pH - SU	07/27/11	1015 hrs	SCS	SB114 (8.8-9.2)	8.98	7.84	8.50	7.94					
TEMPERATURE °C RECEIVED	07/27/11	1015 hrs	SCS	EAS 106		2	1	24					
SPECIFIC CONDUCTANCE umhos	07/27/11	1015 hrs	SCS	ERA506-010511(401-457)	434	19350	875	247					
HARDNESS - ppm	07/27/11	1015 hrs	SCS	ERA P170-507(107-134)	120	320	200	80					
CHLORINE - ppm	07/27/11	1015 hrs	SCS	tap water	+	0.72	<0.04	<0.04					
DISSOLVED OXYGEN - ppm	07/27/11	1015 hrs	SCS	cal@840		<2	6.2	7.5					
TOTAL ALKALINITY - ppm	07/28/11	1500 hrs	SCS	ERA506-010511(60.1-71.9)	65.8	949	212	64.7					
INITIAL AMMONIA - ppm	08/03/11	1400 hrs	JPC	EAS #1981 (8-12)	10.1	99.9	0.227	<0.05					
TOTAL DISSOLVED SOLIDS - ppm													
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU	07/27/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.98	8.22	8.27	8.13	8.19	8.24	8.25	8.22	8.40
TEMPERATURE °C	07/27/11	1100 hrs	SCS	EAS 106		24.1	24.0	24.5	24.5	24.3	24.1	23.9	24.1
SPECIFIC CONDUCTANCE umhos	07/27/11	1100 hrs	SCS	ERA506-010511(401-457)	434	257	843	18340	10090	5500	3150	1948	306
DISSOLVED OXYGEN - ppm	07/27/11	1100 hrs	SCS	cal@840		7.2	8.7	8.4	8.6	8.6	8.7	8.7	7.4
24 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU	07/28/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.91	7.83	8.17	8.27	8.29	8.26	8.32	8.26	7.93
TEMPERATURE °C	07/28/11	1100 hrs	SCS	EAS 106		25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3
SPECIFIC CONDUCTANCE umhos	07/28/11	1100 hrs	SCS	ERA506-010511(401-457)	427	267	846	18250	9990	5480	3130	1938	307
DISSOLVED OXYGEN - ppm	07/28/11	1100 hrs	SCS	cal@840		6.5	6.2	3.4	3.4	4.4	6.2	5.8	6.2
48 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU	07/29/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	7.69	8.08	8.33	8.33	8.32	8.35	8.30	8.11
TEMPERATURE °C	07/29/11	1100 hrs	SCS	EAS 106		24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
SPECIFIC CONDUCTANCE umhos	07/29/11	1100 hrs	SCS	ERA506-010511(401-457)	424	277	870	18540	10190	5570	3190	1988	326
DISSOLVED OXYGEN - ppm	07/29/11	1100 hrs	SCS	cal@840		6.5	6.5	2.2	3.1	4.1	5.0	5.5	6.8
FINAL AMMONIA - ppm													
24 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU	07/28/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.91	8.48	8.34	8.31	8.38	8.35	8.41	8.40	8.16
TEMPERATURE °C	07/28/11	1100 hrs	SCS	EAS 106		25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3
SPECIFIC CONDUCTANCE umhos	07/28/11	1100 hrs	SCS	ERA506-010511(401-457)	427	263	825	17970	9940	5250	3000	1920	280
DISSOLVED OXYGEN - ppm	07/28/11	1100 hrs	SCS	cal@840		7.1	7.0	6.0	6.6	7.0	7.2	7.2	6.9
1 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU	07/29/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	8.27	8.19	8.26	8.45	8.50	8.48	8.39	8.20
TEMPERATURE °C	07/29/11	1100 hrs	SCS	EAS 106		24.1	24.5	24.5	24.5	24.5	24.5	24.5	24.5
SPECIFIC CONDUCTANCE umhos	07/29/11	1100 hrs	SCS	ERA506-010511(401-457)	424	255	795	17620	9770	5190	2980	1880	304
DISSOLVED OXYGEN - ppm	07/29/11	1100 hrs	SCS	cal@840		6.8	7.3	7.4	7.5	7.5	7.4	7.4	7.5
FINAL AMMONIA - ppm													

Page 10 of 15

Approved by: *[Signature]*

Date: 08/10/2011

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: \_\_\_\_\_  
 NPDES NUMBER: \_\_\_\_\_  
 TYPE OF METHOD: \_\_\_\_\_  
 DATE & TIME OF COLLECTION: \_\_\_\_\_  
 DATE & TIME OF SUBMISSION: UPS failure to deliver sample

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC
LOG NUMBER / ID NUMBER								
pH - SU				SB114 (8.8-9.2)				
TEMPERATURE °C RECEIVED				EAS 106				
SPECIFIC CONDUCTANCE umhos				ERA506-010511(401-457)				
HARDNESS - ppm				ERA P170-507(107-134)				
CHLORINE - ppm				tap water				
DISSOLVED OXYGEN - ppm				cal@840				
TOTAL ALKALINITY - ppm				ERA P173-506(42.8-49.6)				
INITIAL AMMONIA - ppm				EAS #1981 (8-12)				
TOTAL DISSOLVED SOLIDS - ppm								

0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU				SB114 (8.8-9.2)									
TEMPERATURE °C				EAS 106									
SPECIFIC CONDUCTANCE umhos				ERA506-010511(401-457)									
DISSOLVED OXYGEN - ppm				cal@840									

72 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU				SB114 (8.8-9.2)									
TEMPERATURE °C				EAS 106									
SPECIFIC CONDUCTANCE umhos				ERA506-010511(401-457)									
DISSOLVED OXYGEN - ppm				cal@840									

96 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
pH - SU				SB114 (8.8-9.2)									
TEMPERATURE °C				EAS 106									
SPECIFIC CONDUCTANCE umhos				ERA506-010511(401-457)									
DISSOLVED OXYGEN - ppm				cal@840									
FINAL AMMONIA - ppm													

Page 11 of 15

Approved by: *[Signature]*

Date: 08/04/2011

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\*AS 2019-002\*\*

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1314124

Date Test Began: July 27, 2011

Time Test Began: 1100 hrs

Analyst 1: DFW

Date Test Finished: July 29, 2011

Time Test Finished: 1100 hrs

Analyst 2: KJR

Analyst 3: SCS

P. promelas (PP)

AGE: 6 days

HATCH NUMBER: 8078 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	10,10
24 HR-PP	10,10	10,10	0,0	0,0	0,0	5,9	10,10	10,10
48 HR-PP	10,10	10,10	0,0	0,0	0,0	0,0	10,9	10,10

Ceriodaphnia dubia (CD)

AGE: <24 hours

HATCH NUMBER: 2357 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
PERIOD	ALIVE							
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5
24 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	0,1,2,2	5,5,5,5	5,5,5,5	5,5,5,5
48 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	0,0,0,0	2,3,3,2	5,5,5,5	5,5,5,5

Approved by:

*J. Shields*

Date:

08/04/2011

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1314124

Date Test Began:

Date Test Finished:

Analyst 1: DFW  
Analyst 2: KJR  
Analyst 3: SCS

P. promelas (PP)

AGE:  days

HATCH NUMBER:

	RC	UC	100%	50%	25%	12.50%	6.25%	RCT
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
48 HR-PP								
72 HR-PP								
96 HR-PP								


Approved by: *J. Shields*

Date: 08/04/2011



*Alor multiple*

114130

**SUBCONTRACT ORDER**

**PDC Laboratories, Inc.  
1072876**

**SENDING LABORATORY:**

PDC Laboratories, Inc.  
2231 W. Altorfer Drive  
Peoria, IL 61615  
Project Manager: Kurt C. Stepping  
kstepping@pdclab.com Phone: 309-683-1719

**RECEIVING LABORATORY:**

Environmental Analysis South  
4000 East Jackson Blvd  
Jackson, MO 63755  
Phone :573-204-8817

Sample Origin (State) \_\_\_\_\_  
PO# L-39351

Analysis	Due	Expires	Comments
Sample ID: 1072876-01 01-Wet Single	Water 08/05/11 16:00	Sampled:07/25/11 16:00 07/27/11 16:00	<i>Emerald</i> <i>Upstream</i> 1314124A <i>PK</i>
Sample ID: 1072876-02 01-Wet Single	Water 08/05/11 16:00	Sampled:07/25/11 16:00 07/27/11 16:00	<i>Emerald</i> <i>Effluent</i> 1314124 <i>JC</i>

*temp rec'd*

*(SEP)*

Relinquished By	Date/Time	Received By	Date/Time	Sample Temperature Upon Receipt	___ C
<i>Regina M. Pearson</i>	<i>7/20/11</i>	<i>131362</i>	<i>7/27/11</i>	Sample(s) Received on Ice	Y or N
				Proper Bottles Received in Good Condition	Y or N
				Bottles Filled with Adequate Volume	Y or N
				Samples Received Within Hold Time	Y or N
				Date/Time Taken From Sample	Y or N



November 4, 2011

Compliance Assurance Section  
Bureau of Water  
Illinois EPA  
1021 North Grande Avenue East  
PO Box 19276  
Springfield, IL 62794-9276

Re: NPDES Biomonitoring -- Permit No. IL0001392

Gentlemen:

In a letter to IEPA dated 11 April 2011, Emerald committed to performance of whole effluent toxicity testing of the Henry plant's WWTP effluent by the standards set in Special Condition 14 of the NPDES permit using an amended schedule. The proposed amended schedule was for testing during the 12<sup>th</sup>, 9<sup>th</sup>, 6<sup>th</sup> and 3<sup>rd</sup> months prior to the expiration date of the current permit. Since no response was received, Emerald assumed that IEPA has no objection to the proposed rescheduling.

Samples were performed on October 10<sup>th</sup> to satisfy the requirement for testing six months prior to permit expiration. Results were received at the Henry plant on Friday, October 28<sup>th</sup>. This submission fulfils the permit requirement that IEPA receive a copy of the report within one week following its receipt at the Henry plant.

Sincerely,

A handwritten signature in black ink that reads "Harold Crouch". The signature is written in a cursive style.

Harold Crouch  
Environmental Engineer

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)



PDC Laboratories, Inc.  
 P.O. Box 9071 • Peoria, IL 61612-9071  
 (309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
 1550 County Rd 1450 N  
 Henry, IL 61537  
 Attn: Jim Hastings

Date Received: 10/11/11 13:37  
 Report Date: 10/28/11  
 Customer #: 202011  
 PO#: HE-40014063-UB

Sample No: 1101004-01  
 Sample Description: UPSTREAM

Collect Date: 10/10/11 16:00  
 Matrix: Waste Water Regular Sample

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	SUBCON		10/12/11 00:00		Subcontracted

Sample No: 1101004-02  
 Sample Description: EFFLUENT

Collect Date: 10/10/11 16:00  
 Matrix: Waste Water

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	SUBCON		10/12/11 00:00		Subcontracted

Sample No: 1101004-03  
 Sample Description: ADDL UP

Collect Date: 10/12/11 16:00  
 Matrix: Waste Water Regular Sample

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	SUBCON		10/12/11 00:00		Subcontracted

Sample No: 1101004-04  
 Sample Description: ADDL EFF

Collect Date: 10/12/11 16:00  
 Matrix: Waste Water Regular Sample

Parameters	Result	Qual	Analysis Date	Analyst	Method
<u>Miscellaneous - Environmental Analysis South</u>					
WET Testing Single Dilution - subcontracted	SUBCON		10/12/11 00:00		Subcontracted



PDC Laboratories, Inc.  
P.O. Box 9071 • Peoria, IL 61612-9071  
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
1550 County Rd 1450 N  
Henry, IL 61537  
Attn: Jim Hastings

Date Received: 10/11/11 13:37  
Report Date: 10/28/11  
Customer #: 202011  
PO#: HE-40014063-UB

### Notes

This report shall not be reproduced, except in full, without the written approval of the laboratory.

PDC Laboratories participates in the following accreditation/certification and proficiency programs at the following locations. Endorsement by Federal or State Governments or their agencies is not implied.

- PIA PDC Laboratories - Peoria, IL  
NELAC Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
Drinking Water Certifications: Kansas (E-10338); Missouri (870); Wisconsin (998284430); Indiana (C-IL-040); Iowa (240)  
Wastewater Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
Hazardous/Solid Waste Certifications; Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
UST Certification; Iowa (240)
- SPM PDC Laboratories - Springfield, MO  
EPA DMR-QA Program
- STL PDC Laboratories - St. Louis, MO  
NELAC Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS EPA Lab No. E-10389

A handwritten signature in black ink, appearing to read 'Kurt Stepping', written over a horizontal line.

Certified by: Kurt C. Stepping, Senior Project Manager

PDC LABORATORIES, INC.  
 2231 WEST ALTORFER DRIVE  
 PEORIA, IL 61615

PHONE # 800-752-6651  
 FAX # 309-692-9689

State where samples collected \_\_\_\_\_

CHAIN OF CUSTODY RECORD

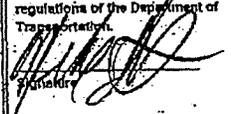
ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT) - (SAMPLE ACCEPTANCE POLICY ON REVERSE)

<b>1</b> CLIENT Emerald Performance Materials ADDRESS: 1500 CR 1500 N CITY: Aurora IL 61207 CONTACT PERSON: Jim Hartman		PROJECT NUMBER P.O. NUMBER MEANS SHIPPED: Courier DATE SHIPPED: 10/11/11	<b>3</b> ANALYSIS REQUESTED GUT TESTING	<b>4</b> (FOR LAB USE ONLY) LOGIN #: H0071101004-2 LOGGED BY: MS LAB PROJ # TEMPLATE: PROJ. MGR.:
<b>2</b> SAMPLE DESCRIPTION AS YOU WANT ON REPORT WET TESTING		DATE COLLECTED: 10/10/11 TIME COLLECTED: 1600 SAMPLE TYPE: 1, 1 MATRIX TYPE: ww BOTTLE COUNT: 2	REMARKS	
<b>5</b> TURNAROUND TIME REQUESTED (PLEASE CIRCLE) NORMAL RUSH RUSH RESULTS VIA (PLEASE CIRCLE) FAX PHONE E-MAIL		<b>6</b> The sample temperature will be measured upon receipt at the lab. By initialing this area you request that the lab notify you, before proceeding with analysis, if the sample temperature is outside of the range of 0.1-6.0°C. By not initialing this area you allow the lab to proceed with analytical testing regardless of the sample temperature.		
<b>7</b> RELINQUISHED BY (SIGNATURE) [Signature] DATE/TIME: 10/11/11 13:37		RECEIVED BY (SIGNATURE) [Signature] DATE/TIME: 10/11/11 13:37		<b>8</b> COMMENTS: (FOR LAB USE ONLY) SAMPLE TEMPERATURE UPON RECEIPT _____ °C CHILL PROCESS STARTED PRIOR TO RECEIPT OR N SAMPLE(S) RECEIVED ON ICE OR N PROPER BOTTLES RECEIVED IN GOOD CONDITION OR N BOTTLES FILLED WITH ADEQUATE VOLUME OR N SAMPLES RECEIVED WITHIN HOLD TIME(S) OR N EXCLUDES TYPICAL FIELD PARAMETERS DATE AND TIME TAKEN FROM SAMPLE BOTTLE

Copies: white should accompany samples to PDC Labs. Yellow copy to be retained by the client.

PAGE \_\_\_\_ OF \_\_\_\_



SHIPPING ORDER		Emerald Performance Materials 1550 County Road 1450 N. Henry, IL 61537		SHIPPING ORDER NUMBER P19- 110392		
AUTHORIZED BY <b>Mike Strabley</b>	OUR PURCHASE ORDER NO. HE-40007640	YOUR INVOICE NO.		PLEASE USE THE ABOVE NUMBER WHEN CORRESPONDING		
PURCHASING DEPT. APPROVAL	SHIPPED FROM Henry, IL 61537	YOUR INVOICE DATE		BILL OF LADING NUMBER		
DATE ENTERED <b>10-13-11</b>	SOLD TO PDC Lab	SHIP TO PDC Lab		O.S.D. & R. REPORT NUMBER		
PLANT LOCATION <b>HENRY</b>	DATE SHIPPED <b>10-13-11</b>	SHIP VIA <input type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT	GROSS WT	CHECKED BY 		
DEPT. NO. <b>2478</b>	F.O.B.	REQUIRED DELIVERY DATE	VALUE IF OVER \$250	This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.		
ACCOUNT <b>6100.1014</b>	HAZARDOUS <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (IF YES, GIVE ADDITIONAL INFORMATION BELOW)	Box No:	Lab Results:	Signature		
CHECK REASON FOR SHIPMENT:	DESCRIPTIONS		QUANTITY	SHIPPED UNIT	PRICE	TOTAL
<input type="checkbox"/> REJECT ED - RETURNED FOR CREDIT	Primary Effluent					NCX
<input type="checkbox"/> REJECT ED - RETURNED FOR REPLACEMENT	Plant Effluent		2			
<input type="checkbox"/> TO BE PREPARED AND RETURNED TO:						
<input type="checkbox"/> CONTAINERS - RETURNED FOR CREDIT						
<input type="checkbox"/> SALES OF PROPERTY						
<input type="checkbox"/> LOAN OF PROPERTY						
<input checked="" type="checkbox"/> SAMPLE FOR EVALUATION						
INSTRUCTION TO VENDOR						
MATERIAL RECEIVED BY: Name:		Date Received:				

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING City of Emerald, IL Plant Effluent, AEC = 100%

EAS LOG# 1402207  
October 12, 2011 through October 16, 2011

### Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)  
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)  
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)  
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
  - 1.1. Data Summation
  - 1.2. Conclusion
2. Method Summation
  - 2.1. Test Conditions and Methods
  - 2.2. Potassium chloride Reference Salt Test
    - 2.2.1. *Pimephales promelas* data
    - 2.2.2. *Ceriodaphnia dubia* data
  - 2.3. Literature Cited
3. Raw Data Bench Sheets
  - 3.1. Initial observations (page 1)
  - 3.2. Zero hour Observations (page 1)
  - 3.3. Twenty-four (24) - Forty-eight (48) hour Observations (page 1)
  - 3.4. Seventy-two (72) - Ninety-six (96) hour Observations (page 2)
  - 3.5. Survival Data Table (page 3-4)
  - 3.6. Test Comments (page 5)
4. Chain of Custody

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



**REPORT OF ACUTE TOXICITY TESTING**  
 City of Emerald, IL  
 Plant Effluent, AEC = 100%

EAS LOG# 1402207  
 October 12, 2011 through October 16, 2011

**1. REPORT SUMMATION:**

**1.1. Multiple Dilution Data Summation**

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 96 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	95%	100%
12.5% Effluent	85%*	100%
25% Effluent	50%*	70%*
50% Effluent	0%*	15%*
100% Effluent	0%*	0%*
<b>Estimated LC<sub>50</sub> Value</b>	22.75% Effluent (18.36% - 28.18%)	31.86% Effluent (26.61% - 38.15%)

\* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

**Conclusion:**

*Pimephales promelas* 96 hour WET results:

LC 50 = 22.75% using Trimmed Spearman-Kärber  
 NOAEC = 6.25% using Steel's Many-One Rank Test

*Ceriodaphnia dubia* 48 hour WET results:

LC 50 = 31.86% using Trimmed Spearman-Kärber  
 NOAEC = 12.5% using Steel's Many-One Rank Test

Approved by \_\_\_\_\_

  
 Sara C. Shields, Chemist

## Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL

Plant Effluent, AEC = 100%

EAS LOG# 1402207

October 12, 2011 through October 16, 2011

## 2. TEST METHOD SUMMARY

## 2.1. TEST CONDITIONS AND METHODS:

	<i>Ceriodaphnia dubia</i> :	<i>Pimephales promelas</i> :
Test duration:	48 hours	96 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18<sup>th</sup> edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

City of Emerald, IL

Plant Effluent, AEC = 100%

EAS LOG# 1402207

October 12, 2011 through October 16, 2011

### 2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on October 5, 2011 using KCL Lot #41713. Following are the results:

2.2.1. *P. promelas* - 48 hr. Acute Test – LC<sub>50</sub> = 1.021 g/l 95%CI (0.708-1.334 g/l)

EAS %CV = 15.3%

National Warning Limits (75<sup>th</sup> percentile) = 19%CV

National Control Limits (90<sup>th</sup> percentile) = 33%CV

2.2.2. *C. dubia* - 48 hr. Acute Test – LC<sub>50</sub> = 0.460 g/l 95%CI (0.297-0.623g/l)

EAS %CV = 17.7%

National Warning Limits (75<sup>th</sup> percentile) = 29%CV

National Control Limits (90<sup>th</sup> percentile) = 34%CV

### 2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2). June 2000. EPA 833-R-00-003.

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: City of Emerald, IL (Plant)

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: 10/10/11 1400 hrs

DATE & TIME OF SUBMISSION: 10/12/11 0940 hrs by UPS

Upstream: River

Collected: 10/10/11 1400 hrs by City of Emerald

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC									
LOG NUMBER / ID NUMBER																	
pH - SU	10/12/11	1000 hrs	SCS	SB114 (8.8-9.2)	8.93	7.83	8.39	7.80									
TEMPERATURE °C RECEIVED	10/12/11	1000 hrs	SCS	EAS 106		3	2	24									
SPECIFIC CONDUCTANCE umhos	10/12/11	1000 hrs	SCS	ERA506-010511(401-457)	442	7740	823	277									
HARDNESS - ppm	10/12/11	1000 hrs	SCS	ERA P170-507(107-134)	120	420	300	80									
CHLORINE - ppm	10/12/11	1000 hrs	SCS	tap water	+	<0.04	<0.04	<0.04									
DISSOLVED OXYGEN - ppm	10/12/11	1000 hrs	SCS	cal@840		6.9	7.6	7.3									
TOTAL ALKALINITY - ppm	10/12/11	1615 hrs	SCS	ERA506-010511(60.1-71.9)	68.9	168	175	61.9									
INITIAL AMMONIA - ppm	10/17/11	1412 hrs	JPC	EAS #1981 (8-12)	9.77	27.1	0.126	<0.05									
TOTAL DISSOLVED SOLIDS -ppm																	
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC				
pH - SU	10/12/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	8.01	8.20	8.12	8.18	8.33	8.40	8.39					
TEMPERATURE °C	10/12/11	1100 hrs	SCS	EAS 106		23.8	24.4	23.5	23.6	23.7	24.0	24.2					
SPECIFIC CONDUCTANCE umhos	10/12/11	1100 hrs	SCS	ERA506-010511(401-457)	442	235	772	7360	4350	2570	1630	1183					
DISSOLVED OXYGEN - ppm	10/12/11	1100 hrs	SCS	cal@840		7.1	8.4	9.5	9.3	9.3	9.3	8.5					
24 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC				
pH - SU	10/13/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.1	7.35	8.12	8.08	8.14	8.17	8.23	8.20					
TEMPERATURE °C	10/13/11	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1					
SPECIFIC CONDUCTANCE umhos	10/13/11	1100 hrs	SCS	ERA506-010511(401-457)	431	252	839	7380	4380	2670	1653	1215					
DISSOLVED OXYGEN - ppm	10/13/11	1100 hrs	SCS	cal@840		6.7	6.6	6.1	6.3	6.3	6.3	6.6					
48 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC				
pH - SU	10/14/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.97	7.59	7.99	8.13	8.16	8.17	8.16	8.10					
TEMPERATURE °C	10/14/11	1100 hrs	SCS	EAS 106		24.7	24.7	24.7	24.7	24.7	24.7	24.7					
SPECIFIC CONDUCTANCE umhos	10/14/11	1100 hrs	SCS	ERA506-010511(401-457)	436	280	835	7500	4500	2780	1670	1211					
DISSOLVED OXYGEN - ppm	10/14/11	1100 hrs	SCS	cal@840		6.3	6.6	5.8	6.0	5.9	6.1	6.5					
FINAL AMMONIA - ppm																	
24 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC				
pH - SU	10/13/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.1	8.00	8.21	8.13	8.25	8.31	8.32	8.27					
TEMPERATURE °C	10/13/11	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1					
SPECIFIC CONDUCTANCE umhos	10/13/11	1100 hrs	SCS	ERA506-010511(401-457)	431	246	797	7180	4250	2560	1636	1216					
DISSOLVED OXYGEN - ppm	10/13/11	1100 hrs	SCS	cal@840		7.1	7.1	7.0	7.0	7.0	7.0	6.9					
48 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC				
pH - SU	10/14/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.97	8.09	8.01	8.24	8.28	8.28	8.26	8.16					
TEMPERATURE °C	10/14/11	1100 hrs	SCS	EAS 106		24.7	24.7	24.7	24.7	24.7	24.7	24.7					
SPECIFIC CONDUCTANCE umhos	10/14/11	1100 hrs	SCS	ERA506-010511(401-457)	436	276	780	7060	4210	2530	1616	1190					
DISSOLVED OXYGEN - ppm	10/14/11	1100 hrs	SCS	cal@840		6.8	6.7	6.5	6.4	6.6	6.5	6.3					
FINAL AMMONIA - ppm																	

Approved by: *[Signature]*

Date: 10/27/2011

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: City of Emerald, IL (Plant)  
 NPDES NUMBER: \_\_\_\_\_  
 TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%  
 DATE & TIME OF COLLECTION: 10/12/11 1600hrs  
 DATE & TIME OF SUBMISSION: 10/14/11 1025 hrs UPS  
 Upstream: River  
 Collected: 10/12/11 1600 hrs by City of Emerald

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC						
LOG NUMBER / ID NUMBER														
pH - SU	10/14/11	1030 hrs	JPC	SB114 (8.8-9.2)	8.97	7.29	7.64	7.80						
TEMPERATURE °C RECEIVED	10/14/11	1030 hrs	JPC	EAS 106		3	2	24						
SPECIFIC CONDUCTANCE umhos	10/14/11	1030 hrs	JPC	ERA506-010511(401-457)	436	14850	818	277						
HARDNESS - ppm	10/14/11	1030 hrs	JPC	ERA P170-507(107-134)	120	600	260	80						
CHLORINE - ppm	10/14/11	1030 hrs	JPC	tap water	+	<0.04	<0.04	<0.04						
DISSOLVED OXYGEN - ppm	10/14/11	1030 hrs	JPC	cal@840		5.4	7.4	7.3						
TOTAL ALKALINITY - ppm	10/19/11	1300 hrs	SCS	ERA506-010511(60.1-71.9)	71.3	86.3	187	61.9						
INITIAL AMMONIA - ppm	10/17/11	1412 hrs	JPC	EAS #1981 (8-12)	9.77	59.9	0.174	<0.05						
TOTAL DISSOLVED SOLIDS -ppm														
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	10/14/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.97	7.86	7.93	8.01	8.21	8.28	8.26	8.24		
TEMPERATURE °C	10/14/11	1100 hrs	SCS	EAS 106		24.7	24.7	24.7	24.7	24.7	24.7	24.7		
SPECIFIC CONDUCTANCE umhos	10/14/11	1100 hrs	SCS	ERA506-010511(401-457)	436	246	788	14800	8220	4550	2670	1725		
DISSOLVED OXYGEN - ppm	10/14/11	1100 hrs	SCS	cal@840		6.7	10.5	8.0	9.1	9.6	9.6	10.3		
72 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	10/15/11	1100 hrs	SCS	SB114 (8.8-9.2)	9.01	8.05	8.10	8.05	8.15	8.23	8.27	8.30		
TEMPERATURE °C	10/15/11	1100 hrs	SCS	EAS 106		24.5	24.5	24.5	24.5	24.5	24.5	24.5		
SPECIFIC CONDUCTANCE umhos	10/15/11	1100 hrs	SCS	ERA506-010511(401-457)	431	249	802	14910	8120	4480	2600	1720		
DISSOLVED OXYGEN - ppm	10/15/11	1100 hrs	SCS	cal@840		6.2	6.2	6.4	5.8	5.4	5.51	5.9		
96 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	10/16/11	1100 hrs	SCS	SB114 (8.8-9.2)	8.94	7.88	8.01	7.97	8.11	8.18	8.15	8.10		
TEMPERATURE °C	10/16/11	1100 hrs	SCS	EAS 106		24.9	24.9	24.9	24.9	24.9	24.9	24.9		
SPECIFIC CONDUCTANCE umhos	10/16/11	1100 hrs	SCS	ERA506-010511(401-457)	437	280	809	15250	8390	4890	2650	1744		
DISSOLVED OXYGEN - ppm	10/16/11	1100 hrs	SCS	cal@840		7.0	7.0	6.8	6.7	6.8	7.2	7.3		
FINAL AMMONIA - ppm														

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

Approved by: *J. Shields*

Date: 10/27/2011

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1402207

Date Test Began: October 12, 2011

Time Test Began: 1100 hrs

Date Test Finished: 10/14/11PP&10/16/11CD

Time Test Finished: 1100 hrs

Analyst 1: DFW  
Analyst 2: KJR  
Analyst 3: SCS

P. promelas (PP)

AGE: 8 days

HATCH NUMBER: 8152 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	3,4	10,10	10,10	10,10	10,10	
48 HR-PP	10/17/2011	10,10	0,0	7,4	10,10	10,10	10,10	

Ceriodaphnia dubia (CD)

AGE: <24 hours

HATCH NUMBER: 2392 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE						
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	2,2,0,1	1,3,4,3	5,5,5,5	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,1,1,1	4,4,3,3	5,5,5,5	5,5,5,5	

Page 12 of 16

Approved by: *[Signature]*

Date: 10/27/2011

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

City of Emerald, IL (Plant) EAS LOG# 1402207

Date Test Began:

Time Test Began:

Analyst 1:

Date Test Finished:

Time Test Finished:

Analyst 2:

Analyst 3:

P. promelas (PP)

AGE:  days

HATCH NUMBER:

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
48 HR-PP	10,10	10,10	0,0	7,4	10,10	10,10	10,10	
72 HR-PP	10,10	10,10	0,0	0,0	8,8	9,10	10,10	
96 HR-PP	10/17/2011	10,10	0,0	0,0	6,4	8,9	10,9	


Approved by: *J. Childs*

Date: 10/27/2011



115064

*Much like  
Alabr*

SUBCONTRACT ORDER

PDC Laboratories, Inc.  
1101004

10/11/2011

PDC Laboratories, Inc.  
2231 W. Altorfer Drive  
Peoria, IL 61615  
Project Manager: Kurt C. Stepping  
kstepping@pdclab.com Phone: 309-683-1719

Environmental Analysis South  
4000 East Jackson Blvd  
Jackson, MO 63755  
Phone :(573) 204-8817

Sample Origin (State) IL  
PO# L 40741

*Ernsald*

Analysis	Due	Expires	Comments
Sample ID: 1101004-01		Waste Water	Sampled: 10/10/11 14:00 <i>Upstream</i>
Wet Testing - Single Dilution	10/21/11 16:00	10/12/11 14:00	<i>Temp rec'd 20°C</i> <b>1402207</b>
Sample ID: 1101004-02		Waste Water	Sampled: 10/10/11 14:00 <i>Effluent</i>
Wet Testing - Single Dilution	10/21/11 16:00	10/12/11 14:00	<b>1402207</b>

<i>Alabr</i>	<i>10-11-11 14:00</i>			Sample Temperature Upon Receipt	<input type="checkbox"/> C
Relinquished By	Date/Time	Received By	Date/Time	Sample(s) Received on Ice	Y or N
		<i>Alabr</i>	<i>10/12/11</i>	Proper Bottles Received in Good Condition	Y or N
				Bottles Filled with Adequate Volume	Y or N
				Samples Received Within Hold Time	Y or N
		<i>940 UPS</i>		Date/Time Taken From Sample Bottle	Y or N

*Renewal for 1402207*

**SUBCONTRACT ORDER**

PDC Laboratories, Inc.

**1101004**

SENDING LABORATORY:

PDC Laboratories, Inc.  
 2231 W. Altorfer Drive  
 Peoria, IL 61615  
 Phone: 309.692.9688  
 Fax: 309.692.9689  
 Project Manager: Kurt C. Stepping

RECEIVING LABORATORY:

Environmental Analysis South  
 4000 East Jackson Blvd  
 Jackson, MO 63755  
 Phone : (573) 204-8817  
 Fax: (573) 204-8818

Analysis	Due	Expires	Laboratory ID	Comments
<del>Sample ID: 1101004-01 01-Wet Single Containers Supplied:</del>	Water	Sampled: 10/10/11 16:00 10/21/11 16:00	██████████ 10/12/11 16:00	
<del>Sample ID: 1101004-02 01-Wet Single Containers Supplied:</del>	Water	Sampled: 10/10/11 16:00 10/21/11 16:00	██████████ 10/12/11 16:00	
Sample ID: 1101004-03 01-Wet Single Containers Supplied:	Water	Sampled: 10/12/11 16:00 10/21/11 16:00	██████████ 10/14/11 16:00	<i>Emerald, IL temp rec'd = 2°C (ES)</i> - A ADDITIONAL SAMPLE
Sample ID: 1101004-04 01-Wet Single Containers Supplied:	Water	Sampled: 10/12/11 16:00 10/21/11 16:00	██████████ 10/14/11 16:00	<i>temp rec'd = 3°C (ES)</i> 11 11

Released By: *[Signature]* Date: 10-13-11 14:00 Received By: *[Signature]* Date: 10/14/11 10:25 UPS

Released By: \_\_\_\_\_ Date: \_\_\_\_\_ Received By: \_\_\_\_\_ Date: \_\_\_\_\_



27 February 2012

Illinois Environmental Protection Agency  
Division of Water Pollution Control  
1021 North Grand Avenue East  
PO Box 19276  
Springfield IL 62794-9276

Attn: Compliance Assurance Section, MC-19

Certified Mail: 7006 0810 0006 5101 4229

Re: **NPDES Permit No. IL0001392**  
**Results of WET Testing**

Gentlemen:

In January 2012, effluent from Emerald's wastewater treatment facility and dilution water from the Illinois River was submitted to Environmental Analysis South, Inc. for whole effluent toxicity testing, as required by the facility's NPDES permit. Results were received by Emerald on 21 February 2012. Attached is a copy of the results.

If you have any questions, please contact me at [harold.crouch@emeraldmaterials.com](mailto:harold.crouch@emeraldmaterials.com) or 309-364-9472.

  
Harold Crouch  
Environmental Engineer

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)



PDC Laboratories, Inc.  
 P.O. Box 9071 • Peoria, IL 61612-9071  
 (309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
 1550 County Rd 1450 N  
 Henry, IL 61537  
 Attn: Jim Hastings

Date Received: 01/24/12 13:18  
 Report Date: 02/21/12  
 Customer #: 202011  
 PO#: HE-40014063-UB

\*Laboratory Results\*

---

Sample No: 2012627-01	Collect Date: 01/23/12 23:59
Sample Description: EFFLUENT	Matrix: Waste Water

---

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b><u>Miscellaneous - Environmental Analysis South</u></b>					
WET Testing Single Dilution - subcontracted	<				Subcontracted

---

Sample No: 2012627-02REAM	Collect Date: 01/24/12 06:00
Sample Description: UPSTREAM	Matrix: Waste Water

---

Parameters	Result	Qual	Analysis Date	Analyst	Method
<b><u>Miscellaneous - Environmental Analysis South</u></b>					
WET Testing Single Dilution - subcontracted	<				Subcontracted

---



PDC Laboratories, Inc.  
P.O. Box 9071 • Peoria, IL 61612-9071  
(309) 692-9688 • (800) 752-6651 • FAX (309) 692-9689



Emerald Performance Materials  
1550 County Rd 1450 N  
Henry, IL 61537  
Attn: Jim Hastings

Date Received: 01/24/12 13:18  
Report Date: 02/21/12  
Customer #: 202011  
PO#: HE-40014063-UB

\*Laboratory Results\*

**Notes**

This report shall not be reproduced, except in full, without the written approval of the laboratory.

PDC Laboratories participates in the following accreditation/certification and proficiency programs at the following locations. Endorsement by Federal or State Governments or their agencies is not implied.

- PIA PDC Laboratories - Peoria, IL  
NELAC Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
Drinking Water Certifications: Kansas (E-10338); Missouri (870); Wisconsin (998284430); Indiana (C-IL-040); Iowa (240)  
Wastewater Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
Hazardous/Solid Waste Certifications: Arkansas (88-0677); Wisconsin (998284430); Iowa (240); Kansas (E-10335)  
UST Certification; Iowa (240)
- SPM PDC Laboratories - Springfield, MO  
EPA DMR-QA Program
- STL PDC Laboratories - St. Louis, MO  
NELAC Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS EPA Lab No. E-10389

WET Analysis subcontracted, report attached.

A handwritten signature in cursive script, appearing to read 'Kurt Stepping'.

Certified by: Kurt C. Stepping, Senior Project Manager

**ENVIRONMENTAL ANALYSIS SOUTH, INC.**

4000 East Jackson Blvd  
Jackson, MO 63755  
Phone: (573) 204-8817 Fax: (573) 204-8818



2007-2/11

**WHOLE EFFLUENT TOXICITY TESTING  
CHAIN OF CUSTODY**

1/24/12 13:11

CLIENT: Emerald Performance Materials

NPDES PERMIT NUMBER: IL 0001392

EFFLUENT NAME: Outfall 001 GRAB  24 HR COMPOSITE   
(LEGAL NAME)

COLLECTION DATA: START DATE: 23 Jan 2012 START TIME: 00:01

FINISH DATE: 23 Jan 2012 FINISH TIME: 23:59

UPSTREAM NAME: Illinois River (GRAB SAMPLE)  
(LEGAL NAME)

COLLECTION DATA: DATE: 24 Jan 2012 TIME: 06:40

SAMPLER NAME: Harold Crouch CARRIER: \_\_\_\_\_  
(PRINT NAME)

Disclaimer: Environmental Analysis South, Inc. shall not be held financially liable for invalid whole effluent toxicity test (WET) or shipping charges resulting from the following reasons:  
• Sampling & holding time errors (Will result in a setup charge of \$100 to the client)  
• Commercial carrier delivery problems or errors (Will result in a setup charge of \$100 to the client)  
• Problems with health or delivery of test organisms by vendor (No setup charge to client)

**SAMPLER CHECK LIST**

NO HEADSPACE IN BOTTLES   
SHIP SAMPLES BY NEXT DAY CARRIER OR DELIVER TO LAB ON \_\_\_\_\_   
SAMPLES TO BE HAND DELIVERED TO LABORATORY SAME DAY AS TEST SETUP   
SUFFICIENT ICE TO COOL SAMPLES TO A RANGE OF 0 - 6°C WHEN SHIPPING OVERNIGHT

RELINQUISHED BY: Harold Crouch DATE: 24 Jan 2012 TIME: 07:30

**LABORATORY USE ONLY**  
**EFFLUENT** LOG NUMBER: 2012007-2/11  
RECEIVED TEMPERATURE: 1 °C THERMOMETER ASSIGNED NUMBER: #6  
HEADSPACE: YES  NO  SAMPLES ICED  or DELIVERED SAME DAY AS TEST   
**UPSTREAM** LOG NUMBER: \_\_\_\_\_  
RECEIVED TEMPERATURE: 1 °C THERMOMETER ASSIGNED NUMBER: #6  
HEADSPACE: YES  or NO  SAMPLES ICED  or DELIVERED SAME DAY AS TEST   
RECEIVED BY: [Signature] DATE: 1/24/12 TIME: 13:18

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING Emerald Performance Materials Effluent, AEC = 100%

EAS LOG# 1407821  
January 25, 2012 through January 27, 2012

### Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)  
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)  
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)  
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
  - 1.1. Data Summation
  - 1.2. Conclusion
2. Method Summation
  - 2.1. Test Conditions and Methods
  - 2.2. Potassium chloride Reference Salt Test
    - 2.2.1. *Pimephales promelas* data
    - 2.2.2. *Ceriodaphnia dubla* data
  - 2.3. Literature Cited
3. Raw Data Bench Sheets
  - 3.1. Initial observations (page 1)
  - 3.2. Zero hour Observations (page 1)
  - 3.3. Twenty-four (24) - Forty-eight (48) hour Observations (page 1)
  - 3.4. Seventy-two (72) – Ninety-six (96) hour Observations (page 2)
  - 3.5. Survival Data Table (page 3-4)
  - 3.6. Test Comments (page 5)
4. Chain of Custody

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



**REPORT OF ACUTE TOXICITY TESTING**  
 Emerald Performance Materials  
 Effluent, AEC = 100%

EAS LOG# 1407821  
 January 25, 2012 through January 27, 2012

1. REPORT SUMMATION:

1.1. Multiple Dilution Data Summation

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 96 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	25%*	95%
12.5% Effluent	0%*	15%*
25% Effluent	0%*	0%*
50% Effluent	0%*	0%*
100% Effluent	0%*	0%*
Estimated LC <sub>50</sub> Value	<6.25% Effluent	9.42% Effluent (8.34% - 10.65%)

\* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

**Note:** Calculations were performed on the 48 hr *Pimephales promelas* data rather than 96 hr due to UPS failure to deliver the renewal effluent.

**Conclusion:**

*Pimephales promelas* 96 hour WET results: LC 50 < 6.25% using Trimmed Spearman-Kärber  
 NOAEC < 6.25% by the Steel's Many-One Rank Test  
*Ceriodaphnia dubia* 48 hour WET results: LC 50 = 9.42% using Trimmed Spearman-Kärber  
 NOAEC = 6.25% by the Steel's Many-One Rank Test

Approved by   
 Sara C. Shields, Chemist

## Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



**REPORT OF ACUTE TOXICITY TESTING**  
**Emerald Performance Materials**  
**Effluent, AEC = 100%**

EAS LOG# 1407821

January 25, 2012 through January 27, 2012

**2. TEST METHOD SUMMARY****2.1. TEST CONDITIONS AND METHODS:**

	<i>Ceriodaphnia dubia:</i>	<i>Pimephales promelas:</i>
Test duration:	48 hours	48 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18<sup>th</sup> edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.

# Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



## REPORT OF ACUTE TOXICITY TESTING

Emerald Performance Materials

Effluent, AEC = 100%

EAS LOG# 1407821

January 25, 2012 through January 27, 2012

### 2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on January 11, 2012 using KCL Lot #41713. Following are the results:

2.2.1. *P. promelas* - 48 hr. Acute Test – LC<sub>50</sub> = 0.978 g/l 95%CI (0.733 g/l -1.222 g/l)

EAS %CV = 12.5%

National Warning Limits (75<sup>th</sup> percentile) = 19%CV

National Control Limits (90<sup>th</sup> percentile) = 33%CV

2.2.2. *C. dubia* - 48 hr. Acute Test – LC<sub>50</sub> = 0.474 g/l 95%CI (0.304 g/l - 0.644g/l)

EAS %CV = 17.9%

National Warning Limits (75<sup>th</sup> percentile) = 29%CV

National Control Limits (90<sup>th</sup> percentile) = 34%CV

### 2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2). June 2000. EPA 833-R-00-003.

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: Emerald Permance Materials, Effluent,

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: 01/23/12 2359 hrs by ARH

DATE & TIME OF SUBMISSION: 01/25/12 1030 hrs by UPS

Upstream: River

Collected: 01/24/12 0600 hrs by ARH

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC					
LOG NUMBER / ID NUMBER						1407821	1407821A	RC4029					
pH - SU	01/25/12	1045 hrs	SCS	SB114 (8.8-9.2)	8.95	7.74	7.70	7.99					
TEMPERATURE °C RECEIVED	01/25/12	1045 hrs	SCS	EAS 106		3	3	24					
SPECIFIC CONDUCTANCE umhos	01/25/12	1045 hrs	SCS	ERA506-0814(452-505)	496	12410	949	242					
HARDNESS - ppm	01/25/12	1045 hrs	SCS	ERA P170-507(107-134)	120	380	400	80					
CHLORINE - ppm	01/25/12	1045 hrs	SCS	tap water	+	<0.04	<0.04	<0.04					
DISSOLVED OXYGEN - ppm	01/25/12	1045 hrs	SCS	cal@840		4.6	7.5	7.4					
TOTAL ALKALINITY - ppm	01/26/12	1000 hrs	SCS	ERAP198-506(76.8-91.5)	86.4	610	229	74.8					
INITIAL AMMONIA - ppm	01/27/12	1100 hrs	JPC	EAS #2446 (8-12)	9.62	72.2	0.062	<0.05					
TOTAL DISSOLVED SOLIDS -ppm													
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	01/25/12	1100 hrs	SCS	SB114 (8.8-9.2)	8.95	8.25	7.84	8.00	8.00	8.00	7.98	7.93	
TEMPERATURE °C	01/25/12	1100 hrs	SCS	EAS 106		24.3	24.6	25.0	24.9	24.9	24.9	24.9	
SPECIFIC CONDUCTANCE umhos	01/25/12	1100 hrs	SCS	ERA506-0814(452-505)	496	282	936	12590	7370	4060	2430	1674	
DISSOLVED OXYGEN - ppm	01/25/12	1100 hrs	SCS	cal@840		8.3	9.6	10.3	10.6	10.7	11.0	11.2	

24 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	01/26/12	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	7.70	8.26	8.39	8.38	8.37	8.36	8.27	
TEMPERATURE °C	01/26/12	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1	
SPECIFIC CONDUCTANCE umhos	01/26/12	1100 hrs	SCS	ERA506-0814(452-505)	490	315	914	12640	7470	4170	2490	1693	
DISSOLVED OXYGEN - ppm	01/26/12	1100 hrs	SCS	cal@840		7.9	7.7	7	7.4	7.4	7.4	7.5	
48 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	01/27/12	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	8.33	8.06	8.39	8.37	8.33	8.26	8.19	
TEMPERATURE °C	01/27/12	1100 hrs	SCS	EAS 106		24.9	24.9	24.9	24.9	24.9	24.9	24.9	
SPECIFIC CONDUCTANCE umhos	01/27/12	1100 hrs	SCS	ERA506-0814(452-505)	501	390	942	12840	7600	4200	2530	1708	
DISSOLVED OXYGEN - ppm	01/27/12	1100 hrs	SCS	cal@840		7.4	7.2	7.0	6.9	6.8	6.9	7.1	
FINAL AMMONIA - ppm													

24 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	01/26/12	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	7.99	8.28	8.48	8.52	8.48	8.45	8.44	
TEMPERATURE °C	01/26/12	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1	
SPECIFIC CONDUCTANCE umhos	01/26/12	1100 hrs	SCS	ERA506-0814(452-505)	490	307	893	12370	7160	3960	2450	1627	
DISSOLVED OXYGEN - ppm	01/26/12	1100 hrs	SCS	cal@840		8.4	8.2	8.2	8.2	8.3	8.3	8.3	
8 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC
pH - SU	01/27/12	1100 hrs	SCS	SB114 (8.8-9.2)	8.93	1.00	8.25	8.71	8.50	8.51	8.46	8.38	
TEMPERATURE °C	01/27/12	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1	
SPECIFIC CONDUCTANCE umhos	01/27/12	1100 hrs	SCS	ERA506-0814(452-505)	501	304	897	12230	7160	4010	2390	1619	
DISSOLVED OXYGEN - ppm	01/27/12	1100 hrs	SCS	cal@840		8.0	8.1	8.0	8.1	8.0	8.1	8.0	
FINAL AMMONIA - ppm													

Page 8 of 13

Approved by:

Date: 02/02/2012

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

CLIENT NAME: Emerald Permance Materials, Effluent,

NPDES NUMBER:

TYPE OF METHOD: multiple dilution, 96 hrs PP & 48 CD, AEC=100%

DATE & TIME OF COLLECTION: Renewal was not received due to UPS error--calculations to be made at 48 hours

DATE & TIME OF SUBMISSION:

Upstream: River

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC						
LOG NUMBER / ID NUMBER								RC4029						
pH - SU				SB114 (8.8-9.2)				7.99						
TEMPERATURE °C RECEIVED				EAS 106				24						
SPECIFIC CONDUCTANCE umhos				ERA506-0814(452-505)				242						
HARDNESS - ppm				ERA P170-507(107-134)	120			80						
CHLORINE - ppm				tap water				<0.04						
DISSOLVED OXYGEN - ppm				cal@840				7.4						
TOTAL ALKALINITY - ppm				ERA P173-506(42.8-49.6)										
INITIAL AMMONIA - ppm				EAS #1981 (8-12)										
TOTAL DISSOLVED SOLIDS -ppm														
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	01/27/12	1100 hrs	SCS	SB114 (8.8-9.2)										
TEMPERATURE °C	01/27/12	1100 hrs	SCS	EAS 106										
SPECIFIC CONDUCTANCE umhos	01/27/12	1100 hrs	SCS	ERA506-0814(452-505)										
DISSOLVED OXYGEN - ppm	01/27/12	1100 hrs	SCS	cal@840										
72 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	01/28/12	1100 hrs	SCS	SB114 (8.8-9.2)										
TEMPERATURE °C	01/28/12	1100 hrs	SCS	EAS 106										
SPECIFIC CONDUCTANCE umhos	01/28/12	1100 hrs	SCS	ERA506-0814(452-505)										
DISSOLVED OXYGEN - ppm	01/28/12	1100 hrs	SCS	cal@840										
96 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.50%	6.25%	X %AEC	
pH - SU	01/29/12	1100 hrs	SCS	SB114 (8.8-9.2)										
TEMPERATURE °C	01/29/12	1100 hrs	SCS	EAS 106										
SPECIFIC CONDUCTANCE umhos	01/29/12	1100 hrs	SCS	ERA506-0814(452-505)										
DISSOLVED OXYGEN - ppm	01/29/12	1100 hrs	SCS	cal@840										
FINAL AMMONIA - ppm														

Approved by: *Al Child*

Date: 02/02/2012

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

Emerald Permance Materials, Effluent, EAS LOG# 1407821

Date Test Began: January 25, 2012

Time Test Began: 1100 hrs

Analyst 1: DFW

Date Test Finished: 11/27/12CD&11/29/12PP

Time Test Finished: 1100 hrs

Analyst 2: KJR

Analyst 3: SCS

P. promelas (PP)

AGE: 7 days

HATCH NUMBER: 8257 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	0,0	0,0	2,1	8,7	8,9	
48 HR-PP	10,10	10,10	0,0	0,0	0,0	0,0	4,1	

Ceriodaphnia dubia (CD)

AGE: <24 hours

HATCH NUMBER: 2429 c-k

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE						
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	2,4,3,5	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	0,0,0,0	0,0,0,0	0,0,0,0	0,0,1,2	5,4,5,5	

Approved by: *J. Childs*

Date: 02/02/2012

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027  
Fifth Edition October 2002

Emerald Permance Materials, Effluent, EAS LOG# 1407821

Date Test Began: January 25, 2012

Time Test Began: 1100 hrs

Analyst 1: DFW

Date Test Finished: 11/27/12CD&11/29/12PP

Time Test Finished: 1100 hrs

Analyst 2: KJR

Analyst 3: SCS

P. promelas (PP)

AGE: 13 days

HATCH NUMBER: 052609cd aro

	RC	UC	100%	50%	25%	12.50%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
48 HR-PP								
72 HR-PP								
96 HR-PP								


Approved by: *[Signature]*

Date: 02/02/2012



116119

IL-96hr

SUBCONTRACT ORDER  
PDC Laboratories, Inc.  
2012627

1/24/2012

PDC Laboratories, Inc.  
2231 W. Altorfer Drive  
Peoria, IL 61615  
Project Manager: Kurt C. Stepping  
kstepping@pdclab.com Phone: 309-683-1719

Environmental Analysis South  
4000 East Jackson Blvd  
Jackson, MO 63755  
Phone :(573) 204-8817

Sample Origin (State) IL  
PO# L 40833

*Emerald*

Analysis	Due	Expires	Comments
Sample ID: 2012627-01 - <i>Effluent</i> Waste Water			Sampled: 01/23/12 23:59 <b>1407821</b> <i>Temp rec 3°C</i>
Wet Testing - Single Dilution	02/03/12 16:00	01/25/12 23:59	
Sample ID: 2012627-02 - <i>River</i> Waste Water			Sampled: 01/24/12 06:00 <b>1407821-A</b> <i>3°C</i>
Wet Testing - Single Dilution	02/03/12 16:00	01/26/12 06:00	

*3°C*  
*SS*

<i>Alan R. [Signature]</i>	1-24-12 13:30			Sample Temperature Upon Receipt	___ C
Relinquished By	Date/Time	Received By	Date/Time	Sample(s) Received on Ice	Y or N
		<i>[Signature]</i>	1/25/12 10:30	Proper Bottles Received in Good Condition	Y or N
				Bottles Filled with Adequate Volume	Y or N
				Samples Received Within Hold Time	Y or N
				Date/Time Taken From Sample Bottle	Y or N



Emerald Performance Materials, LLC  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-2311

CERTIFIED MAIL: 7016 1370 0002 2632 2248

November 7, 2017

Illinois Environmental Protection Agency  
Bureau of Water  
Compliance Assurance Section  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

Re: NPDES Biomonitoring Results- NPDES Permit No. IL0001392

Dear Sir or Madam:

In accordance with special condition number 14 of NPDES permit No. IL0001392 issued to Emerald Performance Materials, attached please find the analytical results for sampling completed September 27<sup>th</sup>, 2017. Attached you will also find a letter from Mr. Kurt Stepping, Senior Project Manager from PDC Labs. Mr. Stepping's letter is in explanation of the delayed submission of this report which is outside of the seven (7) day window required under special condition 14 of the above permit. Mr. David Sikes, EHS&S Manager for the Emerald Performance Materials - Henry, IL facility is responsible for reporting all wastewater treatment results to IEPA and the report attached from PDC was not provided to Mr. Sikes until October 1, 2017 due to an automated email oversight by PDC staff. Mr. Sikes and PDC have taken correction actions to ensure that this incident will not happen again. Emerald is requesting that leniency be shown given the cause of the delay is not a result of Emerald negligence or mistake.

If you have any questions or need addition information, please contact David Sikes at (309)364-9472.

Sincerely,  
EMERALD PERFORMANCE MATERIALS, LLC

A handwritten signature in black ink, appearing to read "J. David Sikes", is written over a faint, larger version of the signature.

J. David Sikes  
EHS&S Manager

Attachments: Letter from Kurt Stepping, Senior Project Manager - PDC Laboratories, Inc.  
PDC Laboratories, Inc. Analytical Data Report (Project WO# 7094078)

cc Todd Huson, IEPA-Regional Office  
CERTIFIED MAIL: 7016 1370 0002 2632 2255



**PDC Laboratories, Inc.**

2231 W. Altonfer Drive • Peoria, IL 61614  
(815) 632-9888 • (800) 752-6661 • FAX (815) 632-9889



November 3, 2017

Mr David Sikes  
Emerald Performance Materials  
1550 CR 1450 N  
Henry, IL 61537

Dear David,

This letter is to document the series of events related to the reporting of your WET testing results for your Henry IL facility.

PDC Laboratories received samples during the week of September 25, 2017. After all analyses, data entry, and data review were completed PDC Laboratories initially processed a report to Emerald on October 12, 2017. The report was processed through our automated Lab Messenger system and emailed to Emerald.

On November 1, 2017 you informed me that you had never received the report. I immediately regenerated a revised report with a comment on the report as to the reason for the revision and emailed this report to you.

On November 3, 2017 I further investigated the email submittal of the initial report. At this time, I discovered that we used a "project" in our LIMS system from several years past when PDC Labs last was involved with the WET testing for Emerald. The prior Emerald contact person's name was changed to yours. We did not however update a "report options" section of the LIMS that specifically directs the outgoing email from the automated system. This reporting options screen is accessed by clicking through a few more screens. This was an oversight on our end. When the initial report was processed it went to the email addresses at Emerald that are still active from when the project was initiated years ago. This did NOT include you.

I apologize for this oversight on the reporting of the WET testing and any inconvenience this may have caused.

Thank you for your attention to this matter, and please let me know if you have any questions.

Sincerely,

PDC Laboratories Inc.

A handwritten signature in cursive script that reads "Kurt C. Stepping".

Kurt C. Stepping  
Senior Project Manager



## PDC Laboratories, Inc.

PROFESSIONAL DEPENDABLE COMMITTED

November 01, 2017

David Sikes  
Emerald Performance Materials  
1550 County Rd 1450 N  
Henry, IL 61537

Dear David Sikes:

Please find enclosed the **revised** analytical results for the sample(s) the laboratory received on **9/25/17 11:30 am** and logged in under work order **7094078**. All testing is performed according to our current TNI certifications unless otherwise noted. This report cannot be reproduced, except in full, without the written permission of PDC Laboratories, Inc.

If you have any questions regarding your report, please contact your project manager. Quality and timely data is of the utmost importance to us.

PDC Laboratories, Inc. appreciates the opportunity to provide you with analytical expertise. We are always trying to improve our customer service and we welcome you to contact the Vice President, John LaPayne with any feedback you have about your experience with our laboratory.

Sincerely,

A handwritten signature in cursive script, appearing to read "John LaPayne".

Senior Project Manager  
(309) 692-9688 x1719  
kstepping@pdclab.com





**PDC Laboratories, Inc.**  
 2231 West Altorfer Drive  
 Peoria, IL 61615  
 (800) 752-6651

**REVISED ANALYTICAL RESULTS**

**Sample:** 7094078-01  
**Name:** EFFLUENT  
**Alias:** Pass. Pimephales Promelas LC50 = 3.78%, Ceriodaphnia Dubia LC50 = > 12.5%

**Sampled:** 09/25/17 09:00  
**Received:** 09/25/17 11:30  
**Matrix:** Waste Water - Composite  
**PO #:** HE40080120-UB

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<b><u>Distilled Nutrients - STL</u></b>							
Ammonia-N	42	mg/L		09/28/17 10:58	09/28/17 11:10	SCI	EPA 350.1*
<b><u>General Chemistry - SPMO</u></b>							
Chlorine - Total Residual	0.14	mg/L	H	09/26/17 16:38	09/26/17 16:38	KB	SM 4500-Cl G*
Conductivity	2900	umhos/cm		09/26/17 12:28	09/26/17 12:28	RRG	SM 2510B
Dissolved Oxygen	8.6	mg/L	H	09/26/17 12:28	09/26/17 12:28	RRG	SM 4500-O G*
pH	8.0	pH Units	H	09/26/17 12:28	09/26/17 12:28	RRG	SM 4500-H B - SW 9040*
<b><u>General Chemistry - STL</u></b>							
Alkalinity - total as CaCO3	700	mg/L		09/27/17 09:30	09/27/17 13:30	SCI	SM 2320B*
<b><u>Total Metals - STL</u></b>							
Calcium	140	mg/L		09/28/17 11:00	10/02/17 15:06	KLA	EPA 200.7
Hardness	520	mg/L		09/28/17 11:00	10/02/17 15:18	KLA	SM 2340B
Magnesium	39	mg/L		09/28/17 11:00	10/02/17 15:18	KLA	EPA 200.7
<b><u>WETT - SPMO</u></b>							
Ceriodaphnia Dubia TUa	< 8.0	units		09/26/17 12:28	09/26/17 12:28	RRG	EPA 2002.0*
Pimephales Promelas TUa	26	units		09/26/17 12:28	09/26/17 12:28	RRG	EPA 2002.0*

**Sample:** 7094078-02  
**Name:** UPSTREAM  
**Matrix:** Waste Water - Grab

**Sampled:** 09/25/17 09:00  
**Received:** 09/25/17 11:30  
**PO #:** HE40080120-UB

Parameter	Result	Unit	Qualifier	Prepared	Analyzed	Analyst	Method
<b><u>Distilled Nutrients - STL</u></b>							
Ammonia-N	0.48	mg/L		09/28/17 10:58	09/28/17 11:10	SCI	EPA 350.1*
<b><u>General Chemistry - SPMO</u></b>							
Chlorine - Total Residual	0.33	mg/L	H	09/26/17 16:38	09/26/17 16:38	KB	SM 4500-Cl G*
Conductivity	700	umhos/cm		09/26/17 12:28	09/26/17 12:28	RRG	SM 2510B
Dissolved Oxygen	8.8	mg/L	H	09/26/17 12:28	09/26/17 12:28	RRG	SM 4500-O G*
pH	8.1	pH Units	H	09/26/17 12:28	09/26/17 12:28	RRG	SM 4500-H B - SW 9040*



**PDC Laboratories, Inc.**  
2231 West Altorfer Drive  
Peoria, IL 61615  
(800) 752-6651

## NOTES

Specific method revisions used for analysis are available upon request.

### Memos

#### Report of Acute Toxicity Testing

##### Reference Toxicity Test:

PDC Laboratories, INC. conducts a monthly reference toxicant test to demonstrate and obtain consistent, precise results for permit compliance purposes. This demonstration is to ensure satisfactory laboratory performance. The most recent reference test results are as follows:

Date Initiated: September 20, 2017

Date Concluded: September 22, 2017

Reference Toxicant: Potassium Chloride (KCl)

Lot Number: 46345704

Expiration: N/A

Standards ID: SPMO1-22B

Moderately Hard Synthetic Water: 31BC3

Prepared: September 14, 2017

Expiration: September 30, 2017

Analyst: RRG

Pimephales promelas: 48 hour Acute Test - LC50 = 750 mg/L

SPMO %CV = 17.84%

National Limits (75th Percentile) = 17.9% CV

National Control Limit (90th Percentile) = 33% CV

Ceriodaphnia dubia: 48 hour Acute Test - LC50 = 736.8 mg/L

SPMO %CV = 26.44%

National Limits (75th Percentile) = 29%CV

National Control Limit (90th Percentile) = 34%CV

##### Literature Cited:

- 1.) APHA. 1992. Standard methods for the examination of water and wastewater, 18th Ed. American Public Health Association, Washington, D.C.
- 2.) USEPA. 2002. Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms, 5th ed. EPA-821-R-02-012
- 3.) USEPA 2000. Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2). June 2000. EPA 833-R-00-003

REVISED REPORT: Regenerated 11/1/17 due to original file lost in client email software crash.



**PDC Laboratories, Inc.**

2231 West Altorfer Drive

Peoria, IL 61615

(800) 752-6651

**Certifications**

CHI - McHenry, IL

TNI Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100279  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17556

PIA - Peoria, IL

TNI Accreditation for Drinking Water, Wastewater, Hazardous and Solid Wastes Fields of Testing through IL EPA Lab No. 100230  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 17553  
Drinking Water Certifications: Iowa (240); Kansas (E-10338); Missouri (870)  
Wastewater Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)  
Hazardous/Solid Waste Certifications: Arkansas (88-0677); Iowa (240); Kansas (E-10338)

SPMO - Springfield, MO

USEPA DMR-QA Program

STL - St. Louis, MO

TNI Accreditation for Wastewater, Hazardous and Solid Wastes Fields of Testing through KS Lab No. E-10389  
Illinois Department of Public Health Bacteriological Analysis in Drinking Water Approved Laboratory Registry No. 171050  
Drinking Water Certifications: Missouri (1050)  
Missouri Department of Natural Resources

\* Not a TNI accredited analyte

**Qualifiers**

H Test performed after the expiration of the appropriate regulatory/advisory maximum allowable hold time.

A handwritten signature in black ink, appearing to read "Kurt Stepping", is written over a horizontal line.

Certified by: Kurt Stepping, Senior Project Manager



**SUBCONTRACT ORDER**  
**Transfer Chain of Custody**

**PDC Laboratories, Inc.**  
**7094078**

**SENDING LABORATORY**

PDC Laboratories, Inc.  
 2231 W Altorfer Dr  
 Peoria, IL 61615  
 (800) 752-6651

**RECEIVING LABORATORY**

PDC Springfield  
 1805 W. Sunset  
 Springfield, MO 65807  
 (417) 864-8924

**Sample: 7094078-01**  
**Name: EFFLUENT**

**Sampled: 09/25/17 09:00**  
**Matrix: Waste Water**  
**Preservative: Cool <6**

Analysis	Due	Expires	Comments
03-WET Multiple	10/05/17 16:00	09/26/17 21:00	

**Sample: 7094078-02**  
**Name: UPSTREAM**

**Sampled: 09/25/17 09:00**  
**Matrix: Waste Water**  
**Preservative: Cool <6**

Analysis	Due	Expires	Comments
03-WET Multiple	10/05/17 16:00	09/26/17 21:00	

Please email results to Kurt Stepping at [kstepping@pdciab.com](mailto:kstepping@pdciab.com)

Date Shipped: 9-25-17 Total # of Containers: 9 Sample Origin (State): FL PO #: \_\_\_\_\_  
 Turn-Around Time Requested  NORMAL  RUSH Date Results Needed: \_\_\_\_\_

Relinquished By	Date/Time	Received By	Date/Time	Sample Temperature Upon Receipt	<u>29</u> °C
<u>[Signature]</u>	<u>9-25-17 1400</u>	<u>KAWANEC</u>	<u>9-26-17 9:20</u>	Sample(s) Received on Ice	<input checked="" type="checkbox"/> or N
				Proper Bottles Received in Good Condition	<input checked="" type="checkbox"/> or N
				Bottles Filled with Adequate Volume	<input checked="" type="checkbox"/> or N
				Samples Received Within Hold Time	<input checked="" type="checkbox"/> or N
				Date/Time Taken From Sample Bottle	<input checked="" type="checkbox"/> or N

### Multiple Dilution WET Test

Sample # 7094078 Client Permit # IL0001397 MHSF 31063  
 Client Emerald Polymer PP Hatch 091817A Board/Shelf 212  
 CD Hatch 092617ICA

Cup	Conc.	Initial	24 hour	48 hour	72 hour	96 hour	Start Date/Time:	Set Times		
P1	6.25	10	8	2	2	1	9-10-17 01310			
P2	Lab	10	10	10	9	9	Date	Time	Analyst	
P3	6.25	10	8	3	1	0	0 Hour	9-26-17 1310	RRH	
P4	12.5	10	0	0	0	0	24 Hour	9-27-17 1320	RRH	
P5	0.78	10	10	10	8	7	48 Hour	9-28-17 1240	RRH	
P6	3.125	10	10	9	7	5	72 Hour	9-29-17 1307	RRH	
P7	0.78	10	10	8	8	6	96 Hour	9-30-17 1320	KLM	
P8	2.5	10	0	0	0	0	End Date/Time:	9-30-17 1320		
P9	1.565	10	10	10	10	9	Results			
P10	Lab	10	10	10	9	9	Pimephales promelas			
P11	1.565	10	10	9	8	5	96 Hour Result	Date	Analyst	
P12	up	10	10	10	8	8	LC 50	3.87	10-2-17	RRH
P13 *	3.125	10	10	9	8	6	TUa	25.84	10-2-17	RRH
P14 *	up	10	10	10	10	9	P-Value	2.0058	10-2-17	RRH
C1	1.565	5	5	5	5	5	Ceriodaphnia Dubia			
C2	12.5	5	5	5	5	5	48 Hour Result	Date	Analyst	
C3	Lab	5	5	5	5	5	LC 50	712.5	10-2-17	RRH
C4	Lab	5	5	5	5	5	TUa	28	10-2-17	RRH
C5	up	5	5	5	5	5	P-Value	1.0000	10-2-17	RRH
C6	0.78	5	5	5	5	5	Filtered (Y/N):	upstream	9-26-17	RRH
C7	0.78	5	5	5	5	5	Light Check:	N/A	9-26-17	RRH
C8	6.25	5	5	5	5	5	PP Fry Age:	8 days	9-26-17	RRH
C9	Lab	5	5	5	5	5	CD Neonates Age:	24 hrs	9-26-17	RRH
C10	Lab	5	5	5	5	5	Comments: PP fry were set in 200 ml of conc. w/in a 250 ml cup .CD were set in 15 ml of conc. w/in a 30 ml cup			
C11	12.5	5	5	5	5	5				
C12	6.25	5	5	5	5	5				
C13	3.125	5	5	5	5	5				
C14	1.565	5	5	5	5	5				
C15	3.125	5	5	5	5	5				
C16	12.5	5	5	5	5	5				
C17	up	5	5	5	5	5				
C18	3.125	5	5	5	5	5				
C19	1.565	5	5	5	5	5				
C20	12.5	5	5	5	5	5				
C21	6.25	5	5	5	5	5				
C22	0.78	5	5	5	5	5	Analyst Signature:	<i>RRH</i>		
C23	0.78	5	5	5	5	5	Date:	10-2-17		
C24	1.565	5	5	5	5	5	Read and			
C25 *	3.125	5	5	5	5	5	Understood By:	<i>RRH</i>		
C26 *	up	5	5	5	5	5	Date:	10-10-17		
C27 *	up	5	5	5	5	5	Logbook:	1	Report #:	42
C28 *	6.25	5	5	5	5	5				

\* These cups only used when upstream samples are provided.



PDC Laboratories, Inc.  
 2231 W. Altorfer Dr  
 Peoria, IL 61615

CHAIN OF CUSTODY RECORD  
 State where samples were collected IL

Phone: (800) 752-6651  
 Fax: (309) 692-9689  
 www.pdcilab.com

ALL HIGHLIGHTED AREAS MUST BE COMPLETED BY CLIENT (PLEASE PRINT)

1 CLIENT: EMERALD PERFORMANCE MATERIALS		P.O. NUMBER	PROJECT NAME: WET	DATE SHIPPED	3 ANALYSIS REQUESTED		4 WORK ORDER (FOR LAB USE ONLY)		
ADDRESS: 1550 CO ROAD 1450 NORTH		PHONE: (309) 364-9472	EMAIL: DAVID.SIKES@EMERALDMATERIALS.COM	MEANS SHIPPED	WET Multiple Dilutions		LOGIN #: 6094078-2		
CITY: HENRY	STATE: IL	ZIP: 61537	SAMPLER (PLEASE PRINT): KURT STEPPING	MATRIX TYPES: WW - WASTE WATER DW - DRINKING WATER GW - GROUND WATER WWSL - SLUDGE NAS - SOLID LCHT - LEACHATE OTHER:			LOGGED BY: [Signature]		PROJECT: Emerald WET
CONTACT PERSON: DAVID SIKES		SAMPLER'S SIGNATURE: [Signature]					PROJ MGR: KURT		REMARKS
2 SAMPLE DESCRIPTION AS YOU WANT TO REPORT		DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB			COMPT	MATRIX TYPE	BOTTLE COUNT
Plant Effluent		9-25-17	0700		X	WW	6	X	
Upstream		9-25-17	0900	X		WW	3	X	
5 TURNAROUND TIME REQUESTED (RUSH FEE IS SUBJECT TO APPROVAL AND SURCHARGE)		<input checked="" type="checkbox"/> NORMAL <input type="checkbox"/> RUSH		DATE RESULTS NEEDED	6 The sample temperature will be measured upon receipt at the lab. By initialing this area, you request that we notify you before proceeding with analysis if the sample temperature is outside of the range of 0-16.0°C. By not initialing this area, you allow the lab to proceed with analytical testing regardless of the sample temperature.				
7 RELINQUISHED BY (SIGNATURE): [Signature]		DATE: 9-25-17	TIME: 1130	RECEIVED BY (SIGNATURE): [Signature]		DATE:	TIME:	8 COMMENTS (FOR LAB USE ONLY)	
RELINQUISHED BY (SIGNATURE): [Signature]		DATE:	TIME:	RECEIVED BY (SIGNATURE): [Signature]		DATE:	TIME:	SAMPLE TEMPERATURE UPON RECEIPT: 14 °C	
RELINQUISHED BY (SIGNATURE): [Signature]		DATE:	TIME:	RECEIVED BY (SIGNATURE): [Signature]		DATE: 9-25-17	TIME: 1130	<input checked="" type="checkbox"/> CORN <input checked="" type="checkbox"/> CORN <input checked="" type="checkbox"/> CORN <input checked="" type="checkbox"/> CORN <input checked="" type="checkbox"/> CORN CHILL PROCESS STARTED PRIOR TO RECEIPT SAMPLE(S) RECEIVED ON ICE PROPER BOTTLES RECEIVED IN GOOD CONDITION BOTTLES FILLED WITH ADEQUATE VOLUME SAMPLES RECEIVED WITHIN HOLD TIME(S) (EXCLUDES TYPICAL FIELD PARAMETERS) DATE AND TIME TAKEN FROM SAMPLE BOTTLE	



**SUBCONTRACT ORDER**  
Transfer Chain of Custody

PDC Laboratories, Inc.  
7094078

SENDING LABORATORY

PDC Laboratories, Inc.  
2231 W Altorfer Dr  
Peoria, IL 61615  
(800) 752-6651

RECEIVING LABORATORY

PDC Laboratories, Inc. - St Louis  
3278 N Highway 67  
Florissant, MO 63033  
(314) 432-0550

Sample: 7094078-01  
Name: EFFLUENT

Sampled: 09/25/17 09:00  
Matrix: Waste Water  
Preservative: Cool <6

Analysis	Due	Expires	Comments
04-Alk	10/05/17 16:00	10/09/17 09:00	
04-Ammonia-N Distill Gallery	10/05/17 16:00	10/23/17 09:00	
04-Ca 200.7 WWTot	10/05/17 16:00	03/24/18 09:00	
04-Mg 200.7 WWTot	10/05/17 16:00	03/24/18 09:00	

Sample: 7094078-02  
Name: UPSTREAM

Sampled: 09/25/17 09:00  
Matrix: Waste Water  
Preservative: H2SO4, cool <6

Analysis	Due	Expires	Comments
04-Ammonia-N Distill Gallery	10/05/17 16:00	10/23/17 09:00	

Please email results to Kurt Stepping at [kstepping@pdclab.com](mailto:kstepping@pdclab.com)

Date Shipped: 9/26/17 Total # of Containers: 5 Sample Origin (State): MO PO #: \_\_\_\_\_  
Turn-Around Time Requested  NORMAL  RUSH Date Results Needed: \_\_\_\_\_

Relinquished By	Date/Time	Received By	Date/Time	Sample Temperature Upon Receipt	3.4 °C
<u>Kawannan</u>	<u>9/26/17</u>	<u>R. Shell</u>	<u>9/27/17 10:30</u>	Sample(s) Received on Ice	<input checked="" type="checkbox"/> Y or N
				Proper Bottles Received in Good Condition	<input checked="" type="checkbox"/> Y or N
				Bottles Filled with Adequate Volume	<input checked="" type="checkbox"/> Y or N
				Samples Received Within Hold Time	<input checked="" type="checkbox"/> Y or N
				Date/Time Taken From Sample Bottle	<input checked="" type="checkbox"/> Y or N

# **EXHIBIT 8**



Page 2 of 2

**Emerald Performance Materials – IL0001392**  
**VN: W-2013-50153**

The Illinois EPA will review the proposed terms for a CCA provided by the facility and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the facility must respond in writing by, either agreeing to and signing the proposed CCA, or by notifying the Illinois EPA that the facility rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to a prosecutorial authority.

Written communications should be directed to:

Illinois EPA – Division of Water Pollution Control  
Attn: Cathy Siders/ CAS#19  
P.O. Box 19276  
Springfield, IL 62794-9276

All communications must include reference to this Violation Notice number, **W-2013-50153**.

Questions regarding this Violation Notice should be directed to Cathy Siders at 217/524-6308.

Sincerely,



Roger Callaway  
Compliance Assurance Section  
Division of Water Pollution Control  
Bureau of Water

Attachments

BOW ID#: W123005002

**ATTACHMENT A**

**Emerald Performance Materials – IL0001392 VIOLATION NOTICE: W-2013-50153**

Questions regarding the violations identified in this attachment should be referred to Cathy Siders at (217) 524-6308.

A review of information available to the Illinois EPA indicates the following violations of statutes, regulations, or permits. Included with each type of violation is an explanation of the activities that the Illinois EPA believes may resolve the violation including an estimated time period for resolution.

**Effluent Violations**

Review the treatment plant operations/operational procedures and evaluate the treatment equipment in order to correct the deficiencies which caused the violations. Compliance is expected to be achieved within 30 days.

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
02/28/2013	Outfall A01-0 Effluent – BOD, 5-day, Effluent Limit
03/31/2013	
04/30/2013	
05/31/2013	
Rule/Reg.:	
	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2010) 35 Ill. Adm. Code 304.141(a) and NPDES Permit

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
02/28/2013	Outfall A01-0 Effluent – Coliform, fecal general, Effluent Limit
03/31/2013	
04/30/2013	
Rule/Reg.:	
	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2010) 35 Ill. Adm. Code 304.141(a) and NPDES Permit

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
03/31/2013	Outfall A01-0 Effluent – Solids, total suspended, Effluent Limit
Rule/Reg.:	
	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2010) 35 Ill. Adm. Code 304.141(a) and NPDES Permit

Page 2 of 2

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
01/31/2013	Outfall A01-0 Effluent – Nitrogen, ammonia total, Effluent Limit

Rule/Reg.: Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2010)  
35 Ill. Adm. Code 304.141(a) and NPDES Permit

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
03/31/2013	Outfall A01-A Effluent – Chlorobenzene, Effluent Limit

Rule/Reg.: Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2010)  
35 Ill. Adm. Code 304.141(a) and NPDES Permit



Emerald Performance Materials  
1550 County Road 1450 N  
Henry, Illinois 61537  
309-364-9411

August 5, 2013

Certified Letter: 7010 3090 0003 0728 1119

Illinois EPA — Division of Water Pollution Control  
Attn: Cathy Siders/ CAS#19  
P.O. Box 19276  
Springfield, IL 62794-9276

Re: Violation Notice **W-2013-50153**

Dear Ms. Siders;

As required by Violation Notice No. W-2013-0153 from Roger Callaway of the Illinois EPA's Compliance Assurance Section dated June 24, 2013, and received June 26, 2013, regarding alleged violations of the NPDES permit (IL0001392) issued to Emerald Performance Materials LLC ("Emerald"), in Henry IL, this letter is sent to explain the circumstances surrounding the noted exceedances of the permitted limits for Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Ammonia, Fecal Coliform, and Chlorobenzene.

Additionally, we have included a description of the actions taken to correct deficiencies that lead to the exceedances and our current compliance status as well as information regarding our desire to enter into a Compliance Commitment Agreement (CCA).

Detailed information regarding each alleged violation/limit exceedance is included below.

- 1. Outfall A01-0 Effluent - BOD, 5-Day, Effluent Limit (02/28/2013, 03/31/2013, 04/30/2013, 05/31/2013)**
  - a. The BOD issues were determined to be due to high food to microorganism (F/M) ratios that were caused by low biomass volume. The biomass volume was depleted due to several days of high pH in the "PC" equalization tank beginning in late 2012, which was followed by an extended period of low F/M.
  - b. Emerald investigated obtaining additional biomass, however, a review of previous additions of biomass in 2008 showed that it was ineffective; the additional biomass resulted in only a slight increase in the F/M ratio, with the system continuing to show high BOD and TSS for several weeks after the addition of the additional biomass.
  - c. A contributing cause was determined to be the record, excessive rainfall the facility received in April 2013 which filled system tanks and did not allow Emerald to reduce the flow from the PC tank to the system in order to minimize the effects of the low biomass. Reducing the discharge from the PC tank to the system is a standard response to high Chemical Oxygen Demand (COD) and/or BOD results

Emerald Performance Materials LLC,  
Response to Violation Notice No. W-2013-50153  
August 2, 2013  
Page 2

(and conversely, increasing discharge when COD/BOD levels are low) in order to maintain correct F/M ratios.

- d. Emerald has returned to compliance and maintained compliance with the 5-day BOD limit for June and July, 2013.

**2. Outfall A01-0 Effluent - Coliform, fecal general, Effluent Limit (02/28/2013, 03/31/2013, 04/30/2013)**

- a. Emerald has initiated the regular addition of bleach to the sanitary portion (the Imhoff) of the waste water treatment plant (WWTP) to reduce the coliform entering the rest of the system.
- b. Emerald completed a partial cleanout of the Imhoff in May 2013, and maintained compliance with the fecal coliform limit throughout May and June of 2013. Warmer weather in July has caused the need for keeping bleach steadily pumping to the Imhoff, therefore the valve on the bleach tote was replaced in order to better control the pumping rate.
- c. Additionally, Emerald added extra bleach to the system after a process cleanout in July. This action is expected to further reduce the coliform in the WWTP.
- d. As an additional action item, Emerald will initiate a project to complete a thorough cleaning of the Imhoff. Determining a method that will cause minimal downtime of the system is a primary concern because production needs for both the Mexichem facility and Emerald will not allow for a complete plant shutdown this calendar year. However, Emerald is committing to initiating a project by November 1, 2013.

**3. Outfall A01-0 Effluent - Solids, total suspended, Effluent Limit (03/31/2013)**

- a. Upsets to the system related to high BOD noted above have also lead to high solids in the effluent because it was more difficult to properly settle the solids in the secondary clarifier.
- b. Emerald has also experienced some mechanical difficulties with the tertiary filters fouling and overflowing the accumulated solids to the final effluent.
- c. Emerald is investigating a project to refurbish or replace the tertiary filters with either an in-kind replacement or a different technology that will support our current system hydraulic and solids loading. While every effort will be made to complete this project as quickly as possible, unknown equipment availability and weather conditions may hinder the necessary construction from occurring. Emerald targets the refurbishment or replacement project to be completed by March 31, 2014.
- d. Until the equipment can be refurbished or replaced, we are striving to keep the equipment running properly. With the exception of a one-day exceedance of the daily maximum limit for TSS in July (caused by an equipment malfunction at the

Emerald Performance Materials LLC,  
Response to Violation Notice No. W-2013-50153  
August 2, 2013  
Page 3

tertiary filters), Emerald has been in compliance with the permit limit since April 2013.

**4. Outfall A01-0 Effluent - Nitrogen, ammonia total, Effluent Limit (01/31/2013)**

- a. Emerald believes that the value of 160 mg/L is statistically in compliance with the 155 mg/L limit, as follows: USEPA Method 350.1 for Ammonia (Revision 2, August 1993) gives Interlaboratory Precision and Accuracy Data for the ammonia test using semi-automated colorimetry. Table 1 of the method gives the following equation for the precision of this test:  $\text{Ammonia Concentration} = 1.003T - 0.003$ , with a Standard Deviation of  $S = 0.052T + 0.019$ , where  $T = \text{True Concentration}$ . If the True Concentration was 160 mg/L, then the Ammonia Concentration could be: 160.5 with a range from 168.8 to 152.1 mg/L (1 standard deviation). If the True Concentration was 155 mg/L, then the Ammonia concentration could be: 155.5 mg/L with a range from 163.5 to 147.4 mg/L. In either case, the value of 160 mg/L is statistically in compliance with the 155 mg/L value.
- b. Historically, very low BOD (<10 mg/L) results indicating that the WWTP is operating efficiently, has resulted in higher than normal ammonia concentrations.
- c. Emerald has not been able to find a reasonable explanation for the one day event of such elevated ammonia. The result for the day before was 100 mg/L and the day after result was 92 mg/L. Typically we see no more than 15% change in results from day to day.
- d. Additionally, Emerald did not exceed the daily load limit for the day that the concentration was at 160 mg/L.
- e. Emerald respectfully maintains that this was not a permit exceedance and that we have been in compliance since January.

**5. Outfall A01-0 Effluent – Chlorobenzene, Effluent Limit (03/31/2013)**

- a. Although Emerald uses and manufactures compounds containing both chlorine and benzene, neither Emerald nor Mexichem produces Chlorobenzene; therefore it is assumed that only the unintended creation of byproducts could produce Chlorobenzene.
- b. Emerald has historically met the Chlorobenzene limit with no difficulty, the effluent was resampled on July 1, 2012 and the results were <0.005 mg/L and <0.006 lbs/day; showing a return to compliance with this permit limit.

Since the labor dispute in 2011, Emerald has had difficulty returning our WWTP staff to the experience level maintained for many years. Two of our most senior WWTP operators did not return after the dispute and one of our experienced operators has retired. While we have strived to replace these important members of our work force, we have also struggled with finding the in-house day-to-day technical support needed to run our complicated system. We hired two

Emerald Performance Materials LLC,  
Response to Violation Notice No. W-2013-50153  
August 2, 2013  
Page 4

environmental engineers, neither of which was able to manage the WWTP operations successfully.

Emerald is currently seeking the services of an outside company to assist with day-to-day WWTP operations while we search for, and retain, another individual to oversee the operations on a permanent basis. We anticipate that we will resolve this issue within six months.

As noted above, the actions and timelines provided herein constitute our proposed Compliance Commitment Agreement. I trust this information is suitable for your needs. If you have any further questions, please contact me at (309) 364-9411.

Sincerely,

A handwritten signature in black ink that reads "Kellie J. Staab". The signature is written in a cursive style with a large initial 'K' and a distinct 'J'.

Kellie J. Staab  
Health, Safety & Environmental Manager  
Emerald Performance Materials, LLC.



## Illinois EPA Compliance Statement

You are required to state that you have returned to compliance with the Act and the regulations that were the subject of the violation notice (VN) (415 ILCS 5/31). The owner of the facility must acknowledge compliance and/or that all compliance commitment agreement (CCA) interim measures/events have been successfully completed and compliance has been achieved.

Please complete, sign, and return.

I \_\_\_\_\_ (*print name*), hereby certify that all violations addressed in Violation Notice (VN) number \_\_\_\_\_ have been addressed and that compliance was achieved on \_\_\_\_\_ (*date*).

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Title*

\_\_\_\_\_  
*Telephone Number*

\_\_\_\_\_  
*Date*

Be sure to retain copies of this document for your files. Should you need additional notification forms, please contact this office at (217)785-0561. Return this completed form to:

Illinois Environmental Protection Agency  
Compliance Assurance Section #19  
Bureau of Water  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

*"Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Agency, .....related to or required by this Act, a regulation adopted under this Act, any federal law or regulation for which the Agency has responsibility, or any permit, term, or condition thereof, commits a Class 4 felony..." (415 ILCS 5/44(h) (8))*

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF: )  
 )  
Emerald Performance Materials )  
1550 County Road 1450 N )  
Henry, Illinois 61537 )  
 )  
Marshall ) ILLINOIS EPA VN W-2013-50153  
 ) BUREAU OF WATER  
 )

---

COMPLIANCE COMMITMENT AGREEMENT

**I. Jurisdiction**

1. This Compliance Commitment Agreement (“CCA”) is entered into voluntarily by the Illinois Environmental Protection Agency (“Illinois EPA”) and **Emerald Performance Materials** (“Respondent”) (collectively, the “Parties”) under the authority vested in the Illinois EPA pursuant to Section 31(a)(7)(i) of the Illinois Environmental Protection Act (“Act”), 415 ILCS 5/31(a)(7)(i).

**II. Allegation of Violations**

2. Respondent owns and/or operates a Chemical Manufacturing Facility in Henry, Marshall County, Illinois.
3. Pursuant to Violation Notice (“VN”) **W-2013-50153**, issued on **June 24, 2013**, the Illinois EPA contends that Respondent has violated the following provisions of the Act and Illinois Pollution Control Board (“Board”) Regulations:
  - a) **Effluent Violations** – Section 12(a), and (f) of the Act, 415 ILCS 5/12, (a), and (f) (2012); 35 Ill. Adm. Code 304.141 (a), and NPDES Permit

### III. Compliance Activities

4. On **August 7, 2013**, the Illinois EPA received the Respondent's response to **VN W-2013-50153**, which included proposed terms for a CCA. The Illinois EPA has reviewed Respondent's proposed CCA terms, as well as considered whether any additional terms and conditions are necessary to attain compliance with the alleged violations cited in the VN.
5. Respondent agrees to undertake, and complete the following actions, which the Illinois EPA has determined are necessary to attain compliance with the allegations contained in **VN W-2013-50153**:
  - a) *Emerald Performance Materials* has initiated the regular addition of bleach to the sanitary portion (the Imhoff) of the Waste Water Treatment Plant (WWTP) to reduce the coliform entering the rest of the system. A project to complete a thorough cleaning of the Imhoff System will be initiated by **November 30, 2013**, to further reduce fecal coliform levels in order to achieve/maintain compliance with the fecal coliform limits in permit IL0001392.
  - b) To achieve/maintain compliance with the total suspended solids effluent limit in permit IL0001392, *Emerald Performance Materials* will refurbish or replace the tertiary filters by **March 31, 2014**.
  - c) Action was taken by *Emerald Performance Materials* to resolve the effluent violations for BOD, 5 day. The facility has returned to compliance.
  - d) Once all violations are corrected and compliance is achieved, the Respondent must submit a completed statement of compliance form (Attached) certifying that all Compliance Commitment Agreement measures/events have been successfully completed. Sign and submit enclosed Compliance Statement with original signatures.

#### IV. Terms and Conditions

6. Respondent shall comply with all provisions of this CCA, including, but not limited to, any appendices to this CCA and all documents incorporated by reference into this CCA. Pursuant to Section 31(a)(10) of the Act, 415 ILCS 5/31(a)(10), if Respondent complies with the terms of this CCA, the Illinois EPA shall not refer the alleged violations that are the subject of this CCA, as described in Section II above, to the Office of the Illinois Attorney General or the State's Attorney of the county in which the alleged violations occurred. Successful completion of this CCA or an amended CCA shall be a factor to be weighed, in favor of the Respondent, by the Office of the Illinois Attorney General in determining whether to file a complaint on its own motion for the violations cited in **VN W-2013-50153**.
7. This CCA is solely intended to address the violations alleged in Illinois EPA **VN W-2013-50153**. The Illinois EPA reserves, and this CCA is without prejudice to, all rights of the Illinois EPA against Respondent with respect to noncompliance with any term of this CCA, as well as to all other matters. Nothing in this CCA is intended as a waiver, discharge, release, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the Illinois EPA may have against Respondent, or any other person as defined by Section 3.315 of the Act, 415 ILCS 5/3.315. This CCA in no way affects the responsibilities of Respondent to comply with any other federal, state or local laws or regulations, including but not limited to the Act, and the Board Regulations.
8. Pursuant to Section 42(k) of the Act, 415 ILCS 5/42(k), in addition to any other remedy or penalty that may apply, whether civil or criminal, Respondent shall be liable for an additional civil penalty of \$2,000 for violation of any of the terms or conditions of this CCA.
9. This CCA shall apply to and be binding upon the Illinois EPA, and on Respondent and Respondent's officers, directors, employees, agents, successors, assigns, heirs, trustees, receivers, and upon all persons, including but not limited to contractors and consultants, acting on behalf of Respondent, as well as upon subsequent purchasers of Respondent's sanitary sewer.
10. In any action by the Illinois EPA to enforce the terms of this CCA, Respondent consents to and agrees not to contest the authority or jurisdiction of the Illinois EPA to enter into or enforce this CCA, and agrees not to contest the validity of this CCA or its terms and conditions.

11. This CCA shall only become effective:
- a) If, within 30 days of receipt, Respondent executes this CCA and submits it, via certified mail, to Illinois EPA Division of Water Pollution Control, Attn: Cathy Siders/CAS #19, P.O. Box 19276, Springfield, IL 62794-9276. If Respondent fails to execute and submit this CCA within 30 days of receipt, via certified mail, this CCA shall be deemed rejected by operation of law; and
  - b) Upon execution by all Parties.
12. Pursuant to Section 31(a)(7.5) of the Act, 415 ILCS 5/31(a)(7.5), this CCA shall not be amended or modified prior to execution by the Parties. Any amendment or modification to this CCA by Respondent prior to execution by all Parties shall be considered a rejection of the CCA by operation of law. This CCA may only be amended subsequent to its effective date, in writing, and by mutual agreement between the Illinois EPA and Respondent's signatory to this CCA, Respondent's legal representative, or Respondent's agent.

**AGREED:**

**FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY:**

BY: Roger Callaway  
Roger Callaway, Manager  
Wastewater Compliance Section  
Bureau of Water

DATE: 10/9/13

**FOR RESPONDENT:**

BY: William P. Stone

DATE: 10/2/13



February 21, 2014

CERTIFIED MAIL – 7010 3090 0003 0728 1348

Illinois Environmental Protection Agency  
Compliance Assurance Section #19  
Bureau of Water  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

Re: Compliance Statement, Compliance Commitment Acceptance,  
Violation Notice **W-2013-50153**  
**Facility I.D.: Emerald Performance Materials**

Dear Sirs;

As required by the Compliance Commitment Acceptance (CCA) for Violation Notice No. W-2013-0153 that was executed on October 9, 2013 by Roger Callaway of the Illinois EPA's Compliance Assurance Section, Emerald Performance Materials (Emerald) is enclosing the signed Illinois EPA Compliance Statement and certifying that Emerald has achieved compliance.

Emerald has achieved compliance with the allegation of VN W-2013-50153 by taking the actions as stated in the CCA.

1. To achieve and maintain compliance with the fecal coliform limits in our NPDES Permit IL0001392 Emerald
  - a. Initiated and has maintained the regular addition of bleach to the sanitary portion (the Imhoff) of the Waste Water Treatment Plant (WWTP) to reduce coliform entering the rest of the system.
  - b. Completed a project to thoroughly clean the Imhoff System.
  - c. Updated the method for collection of the grab sample to ensure less likelihood of contamination from other sources of bacteria and reduce hold time of the sample before analysis.
2. To achieve and maintain compliance with the total suspended solids (TSS) effluent limit in our NPDES Permit IL0001392 Emerald
  - a. Worked with our chemical provider to optimize the chemicals used and their addition rates to achieve better solids removal at the Primary and Secondary Clarifier systems. This change reduced the load of solids on the tertiary filters allowing them to perform within design limits, resulting in effluent TSS measurements under permit limits.

Emerald Polymer Additives, LLC

1550 County Road 1450 N. / Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)

Emerald Performance Materials LLC,  
Compliance Statement, Compliance Commitment Acceptance, Violation Notice W-2013-50153  
February 21, 2014  
Page 2

- b. Developed plans to refurbish and/or replace the tertiary filters in the future, but determined that these costly capital measures were not necessary. The above treatment optimization actions allowed Emerald to achieve compliance with the existing tertiary filters.
3. To achieve and maintain compliance with the BOD, 5 day effluent limit in our NPDES Permit IL0001392, Emerald worked with our chemical provider to optimize the chemicals used and their addition rates, resulting in better solids removal in the Primary Clarifier system, causing an elimination of some potential source BOD's. The reduced solids allowed the Activated Sludge System to better treat the BOD in the feed stream.

If you have any further questions, please contact me at (309) 364-9472.

Sincerely,



John White  
Health, Safety & Environmental Manager  
Emerald Performance Materials, LLC.

Attachment

cc: Roy Harsch

## Illinois EPA Compliance Statement

You are required to state that you have returned to compliance with the Act and the regulations that were the subject of the violation notice (VN) (415 ILCS 5/31). The owner of the facility must acknowledge compliance and/or that all compliance commitment agreement (CCA) interim measures/events have been successfully completed and compliance has been achieved.

Please complete, sign, and return.

I William P. Stone (print name), hereby certify that all violations addressed in Violation Notice (VN) number W-2013-50153 have been addressed and that compliance was achieved on November 30, 2013 (date).

William P. Stone  
Signature

Plant Manager  
Title

309-364-9487  
Telephone Number

February 20, 2014  
Date

Be sure to retain copies of this document for your files. Should you need additional notification forms, please contact this office at (217)785-0561. Return this completed form to:

Illinois Environmental Protection Agency  
Compliance Assurance Section #19  
Bureau of Water  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

*"Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Agency, .....related to or required by this Act, a regulation adopted under this Act, any federal law or regulation for which the Agency has responsibility, or any permit, term, or condition thereof, commits a Class 4 felony..." (415 ILCS 5/44(h) (8))*

# **EXHIBIT 9**



(217) 524-9069

## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR

LISA BONNETT, DIRECTOR

CERTIFIED MAIL # 7013 2630 0001 4706 4608  
RETURN RECEIPT REQUESTED

September 25, 2015

Emerald Performance Materials and Polyone Corporation  
Attn.: Facility owner  
1550 County Road 1450 North  
Henry, IL 61537

*Rec'd  
9/28/2015  
JW*

**Re: Violation Notice: Emerald Performance Materials and Polyone Corporation,  
NPDES Permit No.: IL0001392, BOW ID No.: W1230050002  
Violation Notice No.: W-2015-50227**

Dear Facility Owner:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(1), and is based upon a review of available information and an investigation by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in Attachment A to this notice. Attachment A includes an explanation of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this letter. If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not the facility wishes to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If the facility wishes to enter into a CCA, the written response must also include proposed terms for the CCA that includes dates for achieving each commitment and may include a statement that compliance has been achieved for some or all of the alleged violations. The proposed terms of the CCA should

Page 2 of 2

**Violation Notice: Emerald Performance Materials and Polyone Corporation**  
**Violation Notice No.: W-2015-500227**

contain sufficient detail and must include steps to be taken to achieve compliance and the necessary dates by which compliance will be achieved.

The Illinois EPA will review the proposed terms for a CCA provided by the facility and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the facility must respond in writing by either agreeing to and signing the proposed CCA or by notifying the Illinois EPA that the facility rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to a prosecutorial authority.

Written communications should be directed to:

Illinois EPA – Division of Water Pollution Control  
Attn: Keith Hickey / CAS#19  
P.O. BOX 19276  
Springfield, IL 62794-9276

All communications must include reference to this Violation Notice number, W-2015-50227.

Questions regarding this Violation Notice should be directed to Keith Hickey at 217/524-9069.

Sincerely,



Roger Callaway  
Compliance Assurance Section  
Division of Water Pollution Control  
Bureau of Water

Attachment A

## ATTACHMENT A

### Violation Notice: Emerald Performance Materials and Polyone Corporation

Violation Notice No.: W-2015-500227

Questions regarding the violations identified in this attachment should be referred to Keith Hickey at (217) 524-9069.

Effluent exceedances were reported for the annual parameters Total Cyanide, Total Recoverable Phenolics, and Chlorobenzene for the monitoring period with end date of March 31, 2015. The parameters Carbonaceous BOD and Total Suspended Solids had reported exceedances for the monitoring period with end date of April 30, 2015. In addition, the parameter Carbonaceous BOD had reported exceedances for the monitoring period with end date of May 31, 2015. These are apparent violations of the Environmental Protection Act, Illinois Administrative Codes, and NPDES Permit IL0001392.

A review of information available to the Illinois EPA indicates the following violations of statutes, regulations, or permits. Included with each type of violation is an explanation of the activities that the Illinois EPA believes may resolve the violation including an estimated time period for resolution.

#### Effluent Violations

Review the treatment plant operations/operational procedures and evaluate the treatment equipment in order to correct the deficiencies which caused the violations. Compliance is expected to be achieved within 30 days.

<u>Violation Date</u>	<u>Violation Description</u>
03/31/2015	Outfall A01 Effluent – Total Cyanide, Effluent Limit Outfall A01 Effluent – Total Recoverable Phenolics, Effluent Limit Outfall A01 Effluent – Chlorobenzene, Effluent Limit
Rule/Reg.:	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2014) 35 Ill. Adm. Code 304.141(a) and NPDES Permit IL0001392

<u>Violation Date</u>	<u>Violation Description</u>
04/30/2015	Outfall A01 Effluent – Total Suspended Solids, Effluent Limit
Rule/Reg.:	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2014) 35 Ill. Adm. Code 304.141(a) and NPDES Permit IL0001392

Page 2 of 2

**Violation Notice: Emerald Performance Materials and Polyone Corporation**

**Violation Notice No.: W-2015-500227**

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
04/30/2015	Outfall A01 Effluent – Carbonaceous BOD, Effluent Limit
05/31/2015	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2014)
Rule/Reg.:	35 Ill. Adm. Code 304.141(a) and NPDES Permit IL0001392



October 9, 2015

**CERTIFIED MAIL: 7015 0640 0006 8491 5150**

Illinois EPA — Division of Water Pollution Control  
Attn: Roger Calloway/ CAS#19  
P.O. Box 19276  
Springfield, IL 62794-9276

Re: Violation Notice **W-2015-50227**

Dear Mr. Calloway;

As required by Violation Notice No. W-2015-0227 from Roger Calloway of the Illinois EPA's Compliance Assurance Section dated September 25, 2015, and received September 28, 2015, regarding alleged violations of NPDES permit IL0001392 issued to Emerald Performance Materials LLC ("Emerald"), in Henry IL, this letter is sent to explain the circumstances surrounding the noted exceedances of the permitted limits for Carbonaceous Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Total Cyanide, Total Recoverable Phenolics, and Chlorobenzene.

Additionally, we have included a description of the actions taken to correct deficiencies that led to the exceedances and our current compliance status as well as information regarding our desire to enter into a Compliance Commitment Agreement (CCA).

Detailed information regarding each alleged violation/limit exceedance is included below.

- 1. Outfall A01- Effluent – Total Cyanide, Total Recoverable Phenolics, and Chlorobenzene, Effluent Limit (03/31/2015)**
  - a. Emerald's NPDES permit IL-0001392 contains a limit for phenol but not Total Recoverable Phenolics. The eDMR and NetDMR has listed Total Recoverable Phenolics instead of Phenol for some time. Because the limits in the electronic DMR are the same as phenol limit in the permit we have reported phenol results in the DMR as Total Recoverable Phenolics, even though we only test for Phenol via EPA Method 625 as opposed to Method 420 for Total Recoverable Phenolics.
  - b. Phenol and chlorobenzene values outside the limits are believed to be a result of unknown contaminates in a purchased intermediate chemical raw material. The use of this intermediate has ceased and will not be resumed.

Emerald Polymer Additives, LLC

1550 County Road 1450 N. / Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)

Emerald Performance Materials LLC,  
Response to Violation Notice No. W-2015-50227  
October 9, 2015  
Page 2

- c. Emerald has historically met the chlorobenzene and phenol limits with no difficulty. Resampling and retesting for phenol on March 19<sup>th</sup> and 20<sup>th</sup> showed a maximum concentration of 0.005 mg/L. Resampling and retesting of chlorobenzene on April 6<sup>th</sup>, showed a level of 0.0051 mg/L. These and subsequent results indicate a return to compliance with the permit limits for both chlorobenzene and phenol.
- d. Emerald does use and produce materials containing nitriles; however, historically we have met the total cyanide limit with no difficulty.
- e. The test method for cyanide has known interferences and we believe these interfering compounds may be present in our effluent at very low levels but at concentrations high enough to interfere with the analytical test results. We investigated sample collection and preparation methods that are allowed by EPA Method 4500 CN-C for sources of possible interference.
- f. Once we determined the best way to collect and prepare the sample for analysis, we resampled and retested for total cyanide on July 14<sup>th</sup> and 15<sup>th</sup>. The results for these samples were 0.060 mg/L and 0.068 mg/L respectively. These results indicate a return to compliance with the permit limit.

**2. Outfall A01-0 Effluent - Total Suspended Solids, Effluent Limit (04/30/2015)**

- a. The occurrence was caused by an ineffective coagulant chemical in the waste water treatment clarifier. The ineffective chemical was taken out of service and replaced with a more effective material.
- b. Emerald has returned to compliance and maintained compliance with the TSS limit since April 8, 2015, as reported on the NetDMR.

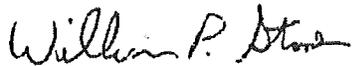
**3. Outfall A01-0 Effluent - BOD, 5-Day, Effluent Limit (04/30/2015, 05/31/2015)**

- a. The BOD issues were determined to be due to bioactivity inhibition in the biotreater tank. In May, a treatment system mechanical failure was found, which has been repaired. The mechanical failure was a likely contributor to the bioactivity inhibition.
- b. Daily meetings were held to investigate and eliminate the source of any inhibitor and eliminate or reduce any excessive amounts that were entering the waste water treatment system and also to adjust, as necessary, controls on biomass inputs (wasting rates, feed mix, etc.).
- c. The BOD levels returned to values below the permit limits on May 26<sup>th</sup>.
- d. Emerald has returned to compliance and maintained compliance with the 5-day BOD limit as reported on the NetDMR.

Emerald Performance Materials LLC,  
Response to Violation Notice No. W-2015-50227  
October 9, 2015  
Page 3

As noted above, the actions and timelines provided show Emerald's return to compliance and herein constitute our proposed Compliance Commitment Agreement. I trust this information is suitable for your needs. If you have any further questions, please contact Kellie Staab of my staff at (309) 364-9411.

Sincerely,

A handwritten signature in black ink that reads "William P. Stone". The signature is written in a cursive style with a large initial "W".

William P. Stone  
Plant Manager



## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829  
BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

217/524-9069

CERTIFIED MAIL # 7013 2630 0001 4706 6380  
RETURN RECEIPT REQUESTED

November 18, 2015

Emerald Performance Materials and Polyone Corporation  
Attn: William Stone  
1550 County Road 1450 North  
Henry, IL 61537

*Received  
11/20/15 WPS*

**Re: Compliance Commitment Acceptance, Violation Notice: W-2015-50227,  
Emerald Performance Materials and Polyone Corporation, NPDES ID#: IL0001392,  
BOW ID#: W1230050002**

Dear Mr. Stone:

The Illinois Environmental Protection Agency ("Illinois EPA") has approved the Compliance Commitment Agreement ("CCA") for Emerald Performance Materials and Polyone Corporation. Please find enclosed an executed copy of the CCA for your records.

Failure to fully comply with the CCA may, at the sole discretion of the Illinois EPA, result in referral of this matter to the Office of the Attorney General, the State's Attorney or the United States Environmental Protection Agency.

The CCA does not constitute a waiver or modification of the terms and conditions of any license or permit issued by the Illinois EPA or any other unit or department of local, state or federal government or of any local, state or federal statute or regulatory requirement.

Questions regarding this matter should be directed to Keith Hickey at 217/524-9069. Written communications should be directed to the Illinois EPA Division of Water Pollution Control, Attn: Keith Hickey/CAS #19, P.O. Box 19276, Springfield, IL 62794-9276, and all communications shall include reference to your Violation Notice Number W-2015-50227.

Sincerely,

A handwritten signature in black ink that reads "Roger Callaway".

Roger Callaway  
Compliance Assurance Section  
Bureau of Water

Enclosure

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF: )  
 )  
 EMERALD PERFORMANCE MATERIALS )  
 AND POLYONE CORPORATION )  
 IL0001392 )  
 1550 COUNTY ROAD 1450 NORTH )  
 HENRY, IL 61537 )  
 )  
 MARSHALL COUNTY )

RECEIVED

NOV 17 2015

EPA/CA

ILLINOIS EPA VN W-2015-50227  
 BUREAU OF WATER

COMPLIANCE COMMITMENT AGREEMENT

**I. Jurisdiction**

1. This Compliance Commitment Agreement ("CCA") is entered into voluntarily by the Illinois Environmental Protection Agency ("Illinois EPA") and **Emerald Performance Materials and Polyone Corporation** ("Respondent") (collectively, the "Parties") under the authority vested in the Illinois EPA pursuant to Section 31(a)(7)(i) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(7)(i).

**II. Allegation of Violations**

2. Respondent owns and/or operates the wastewater treatment facility in Henry, Marshall County, Illinois.
3. Pursuant to Violation Notice ("VN") **W-2015-50227**, issued on **September 25, 2015**, the Illinois EPA contends that Respondent has violated the following provisions of the Act and Illinois Pollution Control Board ("Board") Regulations:
  - a) **Effluent Violations** - Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2014) 35 Ill. Adm. Code 304.141(a) and NPDES Permit IL0001392

### III. Compliance Activities

4. On **October 13, 2015**, the Illinois EPA received Respondent's responses to VN W-2015-50227, which included proposed terms for a CCA. The Illinois EPA has reviewed Respondent's proposed CCA terms, as well as considered whether any additional terms and conditions are necessary to attain compliance with the alleged violations cited in the VN.
5. Respondent agrees to undertake, and complete the following actions, which the Illinois EPA has determined are necessary to attain compliance with the allegations contained in VN W-2015-50227:
  - a) On **February 21, 2015** the Respondent ceased use and will not resume use of an intermediate chemical raw material believed to contain unknown containments that increased the amount phenol and chlorobenzene above permit limits. Respondent returned to compliance with the phenol and chlorobenzene limits on **March 19, 2015** and **March 20, 2015**.
  - b) On **July 14, 2015** and **July 15, 2015** the Respondent changed testing procedures for cyanide to an allowable method under EPA Methods 4500 CN-C to remove known testing interferences and returned to compliance with the Cyanide permit limit.
  - c) On **April 6, 2015** the Respondent replaced the coagulant chemical in the waste water treatment clarifier and returned to compliance with the total suspended solids permit limit on **April 8, 2015**.
  - d) On **May 15, 2015** the Respondent repaired a treatment system mechanical failure that contributed to bioactivity inhibition in the biotreater tank that increased the carbonaceous BOD 5-day amount. Respondent returned to compliance with the carbonaceous BOD 5-day Permit limit on **May 26, 2015**.
  - e) Once all violations are corrected and compliance is achieved, the Respondent must submit a completed statement of compliance form (Attached) certifying that all Compliance Commitment Agreement measures/events have been successfully completed. Sign and submit enclosed Compliance Statement with original signatures.

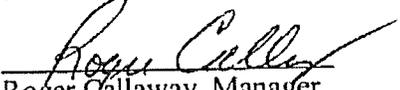
#### IV. Terms and Conditions

6. Respondent shall comply with all provisions of this CCA, including, but not limited to, any appendices to this CCA and all documents incorporated by reference into this CCA. Pursuant to Section 31(a)(10) of the Act, 415 ILCS 5/31(a)(10), if Respondent complies with the terms of this CCA, the Illinois EPA shall not refer the alleged violations that are the subject of this CCA, as described in Section II above, to the Office of the Illinois Attorney General or the State's Attorney of the county in which the alleged violations occurred. Successful completion of this CCA or an amended CCA shall be a factor to be weighed, in favor of the Respondent, by the Office of the Illinois Attorney General in determining whether to file a complaint on its own motion for the violations cited in VN W-2015-50227.
7. This CCA is solely intended to address the violations alleged in Illinois EPA VN W-2015-50227. The Illinois EPA reserves, and this CCA is without prejudice to, all rights of the Illinois EPA against Respondent with respect to noncompliance with any term of this CCA, as well as to all other matters. Nothing in this CCA is intended as a waiver, discharge, release, or covenant not to sue for any claim or cause of action, administrative or judicial, civil or criminal, past or future, in law or in equity, which the Illinois EPA may have against Respondent, or any other person as defined by Section 3.315 of the Act, 415 ILCS 5/3.315. This CCA in no way affects the responsibilities of Respondent to comply with any other federal, state or local laws or regulations, including but not limited to the Act, and the Board Regulations.
8. Pursuant to Section 42(k) of the Act, 415 ILCS 5/42(k), in addition to any other remedy or penalty that may apply, whether civil or criminal, Respondent shall be liable for an additional civil penalty of \$2,000 for violation of any of the terms or conditions of this CCA.
9. This CCA shall apply to and be binding upon the Illinois EPA, and on Respondent and Respondent's officers, directors, employees, agents, successors, assigns, heirs, trustees, receivers, and upon all persons, including but not limited to contractors and consultants, acting on behalf of Respondent, as well as upon subsequent purchasers of Respondent's Facility.
10. In any action by the Illinois EPA to enforce the terms of this CCA, Respondent consents to and agrees not to contest the authority or jurisdiction of the Illinois EPA to enter into or enforce this CCA, and agrees not to contest the validity of this CCA or its terms and conditions.

11. This CCA shall only become effective:
- a) If, within 30 days of receipt, Respondent executes this CCA and submits it, via certified mail, to Illinois EPA Division of Water Pollution Control, Attn: Keith Hickey/CAS #19, P.O. Box 19276, Springfield, IL 62794-9276. If Respondent fails to execute and submit this CCA within 30 days of receipt, via certified mail, this CCA shall be deemed rejected by operation of law; and
  - b) Upon execution by all Parties.
12. Pursuant to Section 31(a)(7.5) of the Act, 415 ILCS 5/31(a)(7.5), this CCA shall not be amended or modified prior to execution by the Parties. Any amendment or modification to this CCA by Respondent prior to execution by all Parties shall be considered a rejection of the CCA by operation of law. This CCA may only be amended subsequent to its effective date, in writing, and by mutual agreement between the Illinois EPA and Respondent's signatory to this CCA, Respondent's legal representative, or Respondent's agent.

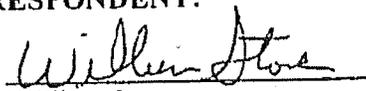
**AGREED:**

**FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY:**

BY:   
Roger Callaway, Manager  
Wastewater Compliance Section  
Bureau of Water

DATE: 11/18/15

**FOR RESPONDENT:**

BY:   
William Stone  
Plant Manager  
Emerald Performance Materials  
and Polyone Corporation

DATE: 11/13/15



November 23, 2015

CERTIFIED MAIL – 7015 0640 0006 8491 5198

Illinois Environmental Protection Agency  
Compliance Assurance Section #19  
Bureau of Water  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, IL 62794-9276

Re: Compliance Statement  
Compliance Commitment Acceptance  
Violation Notice **W-2015-50227**  
**Facility I.D.: Emerald Performance Materials**

Dear Sirs;

As required by the Compliance Commitment Acceptance (CCA) for Violation Notice No. W-2015-50227 that was executed on November 18, 2015 by Roger Callaway of the Illinois EPA's Compliance Assurance Section, Emerald Performance Materials (Emerald) is enclosing the signed Illinois EPA Compliance Statement and certifying that Emerald has achieved compliance.

Emerald has achieved compliance with the allegation of VN W-2015-50227 by taking the actions as stated in the CCA.

If you have any further questions, please contact Kellie Staab of my staff at (309) 364-9411.

Sincerely,

A handwritten signature in black ink that reads "William P. Stone". The signature is written in a cursive style.

William P. Stone  
Plant Manager

Emerald Polymer Additives, LLC

1550 County Road 1450 N./ Henry, IL 61537 / Phone: 309-364-2311 / Fax: 309-364-9460  
[www.emeraldmaterials.com](http://www.emeraldmaterials.com)

## Illinois EPA Compliance Statement

You are required to state that you have returned to compliance with the Act and the regulations that were the subject of the violation notice (VN) (415 ILCS 5/31). The owner of the facility must acknowledge compliance and/or that all compliance commitment agreement (CCA) interim measures/events have been successfully completed and compliance has been achieved.

Please complete, sign, and return.

I William P. Stone (print name), hereby certify that all violations addressed in Violation Notice (VN) number W2015-50227 have been addressed and that compliance was achieved on July 14, 2015 (date).

William P. Stone  
Signature

Plant Manager  
Title

309-364-9487  
Telephone Number

November, 23, 2015  
Date

Be sure to retain copies of this document for your files. Should you need additional notification forms, please contact this office at (217)785-0561. Return this completed form to:

Illinois Environmental Protection Agency  
Compliance Assurance Section #19  
Bureau of Water  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

*"Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Agency, .....related to or required by this Act, a regulation adopted under this Act, any federal law or regulation for which the Agency has responsibility, or any permit, term, or condition thereof, commits a Class 4 felony..." (415 ILCS 5/44(h) (8))*

# **EXHIBIT 10**



## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

JB PRITZKER, GOVERNOR

JOHN J. KIM, ACTING DIRECTOR

(217) 524-6308

CERTIFIED MAIL # 7017 2680 0001 0214 3554  
RETURN RECEIPT REQUESTED

March 18, 2019

Emerald Polymer Additives, LLC  
1550 County Road 1450 N  
Henry, IL 61537

**Re: Violation Notice: Emerald Polymer Additives, LLC – IL0001392**  
**Violation Notice No.: W-2019-50007**  
**BOW ID No.: W1230050002**

Dear Facility Owner:

This constitutes a Violation Notice pursuant to Section 31(a)(1) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/31(a)(1), and is based upon a review of available information and an investigation by representatives of the Illinois Environmental Protection Agency ("Illinois EPA").

The Illinois EPA hereby provides notice of alleged violations of environmental laws, regulations, or permits as set forth in Attachment A to this notice. Attachments A and B include explanations of the activities that the Illinois EPA believes may resolve the specified alleged violations, including an estimate of a reasonable time period to complete the necessary activities. Due to the nature and seriousness of the alleged violations, please be advised that resolution of the violations may also require the involvement of a prosecutorial authority for purposes that may include, among others, the imposition of statutory penalties.

**A written response, which may include a request for a meeting with representatives of the Illinois EPA, must be submitted via certified mail to the Illinois EPA within 45 days of receipt of this letter.** If a meeting is requested, it shall be held within 60 days of receipt of this notice. The response must include information in rebuttal, explanation, or justification of each alleged violation and a statement indicating whether or not the facility wishes to enter into a Compliance Commitment Agreement ("CCA") pursuant to Section 31(a) of the Act. If the facility wishes to enter into a CCA, the written response must also include proposed terms for the CCA that includes dates for achieving each commitment and may include a statement that compliance has been achieved for some or all of the alleged violations. The proposed terms of the CCA should contain sufficient detail and must include steps to be taken to achieve compliance and the necessary dates by which compliance will be achieved.

4302 N. Main St., Rockford, IL 61103 (815) 997-7760  
595 S. State St., Elgin, IL 60123 (847) 608-3131  
2125 S. First St., Champaign, IL 61820 (217) 278-5800  
2009 Mall St., Collinsville, IL 62234 (618) 346-5120

9511 Harrison St., Des Plaines, IL 60016 (847) 294-4000  
412 SW Washington St., Suite D, Peoria, IL 61602 (309) 671-3022  
2309 W. Main St., Suite 116, Marion, IL 62959 (618) 993-7200  
100 W. Randolph St., Suite 4-500, Chicago, IL 60601

Page 2 of 2

**Violation Notice: Emerald Polymer Additives, LLC – IL0001392**  
**Violation Notice No.: W-2019-50007**

The Illinois EPA will review the proposed terms for a CCA provided by the facility and, within 30 days of receipt, will respond with either a proposed CCA or a notice that no CCA will be issued by the Illinois EPA. If the Illinois EPA sends a proposed CCA, the facility must respond in writing by either agreeing to and signing the proposed CCA or by notifying the Illinois EPA that the facility rejects the terms of the proposed CCA.

If a timely written response to this Violation Notice is not provided, it shall be considered a waiver of the opportunity to respond and meet, and the Illinois EPA may proceed with referral to a prosecutorial authority.

Written communications should be directed to:

Illinois EPA – Division of Water Pollution Control  
Attn: **Cathy Siders / CAS#19**  
P.O. BOX 19276  
Springfield, IL 62794-9276

All communications must include reference to this Violation Notice number, **W-2019-50007**.

Questions regarding this Violation Notice should be directed to **Cathy Siders at 217/524-6308**.

Sincerely,



Roger Callaway  
Compliance Assurance Section  
Division of Water Pollution Control  
Bureau of Water

Attachments A & B

## ATTACHMENT A

**Violation Notice: Emerald Polymer Additives, LLC – IL0001392**

**Violation Notice No.: W-2019-50007**

Questions regarding the violations identified in this attachment should be referred to **Cathy Siders** at (217) 524-6308.

A review of information available to the Illinois EPA indicates the following violations of statutes, regulations, or permits. Included with each type of violation is an explanation of the activities that the Illinois EPA believes may resolve the violation including an estimated time period for resolution.

### Effluent Violations

Review the treatment plant operations/operational procedures and evaluate the treatment equipment in order to correct the deficiencies which caused the violations. Compliance is expected to be achieved within 30 days.

<u>Violation Date</u>	<u>Violation Description</u>
08/31/2018 09/30/2018 10/31/2018 11/30/2018 01/31/2019	Outfalls A01-0 Effluent – Solids, total suspended, Effluent Limit
Rule/Reg.:	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2016) 35 Ill. Adm. Code 304.141(a), and NPDES Permit

<u>Violation Date</u>	<u>Violation Description</u>
08/31/2018 09/30/2018 10/31/2018	Outfalls A01-0 Coliform, fecal general, Effluent Limit
Rule/Reg.:	Section 12(a) and (f) of the Act, 415 ILCS 5/12 (a) and (f) (2016) 35 Ill. Adm. Code 304.141(a) and NPDES Permit

**Failure to Comply with NPDES Permit**

Establish and implement procedures to assure compliance with the monitoring, sampling, recording and reporting requirements set forth in the NPDES Permit. Compliance is expected immediately.

<b><u>Violation Date</u></b>	<b><u>Violation Description</u></b>
08/01/2018 - Present	Failure to comply with the reporting requirements of NPDES Permit #IL0001392
Rule/Reg.	Section 12 (f) of the Act, 415 ILCS 5/12(f) (2016); 35 Ill. Adm. Code 305.102(b) & 309.102(a); NPDES Permit

## ATTACHMENT B

**Violation Notice: Emerald Polymer Additives, LLC – IL0001392**

**Violation Notice No.: W-2019-50007**

The Illinois EPA offers the following recommendations to assist your facility in attaining compliance with the applicable regulations related to the apparent violations in Attachment A:

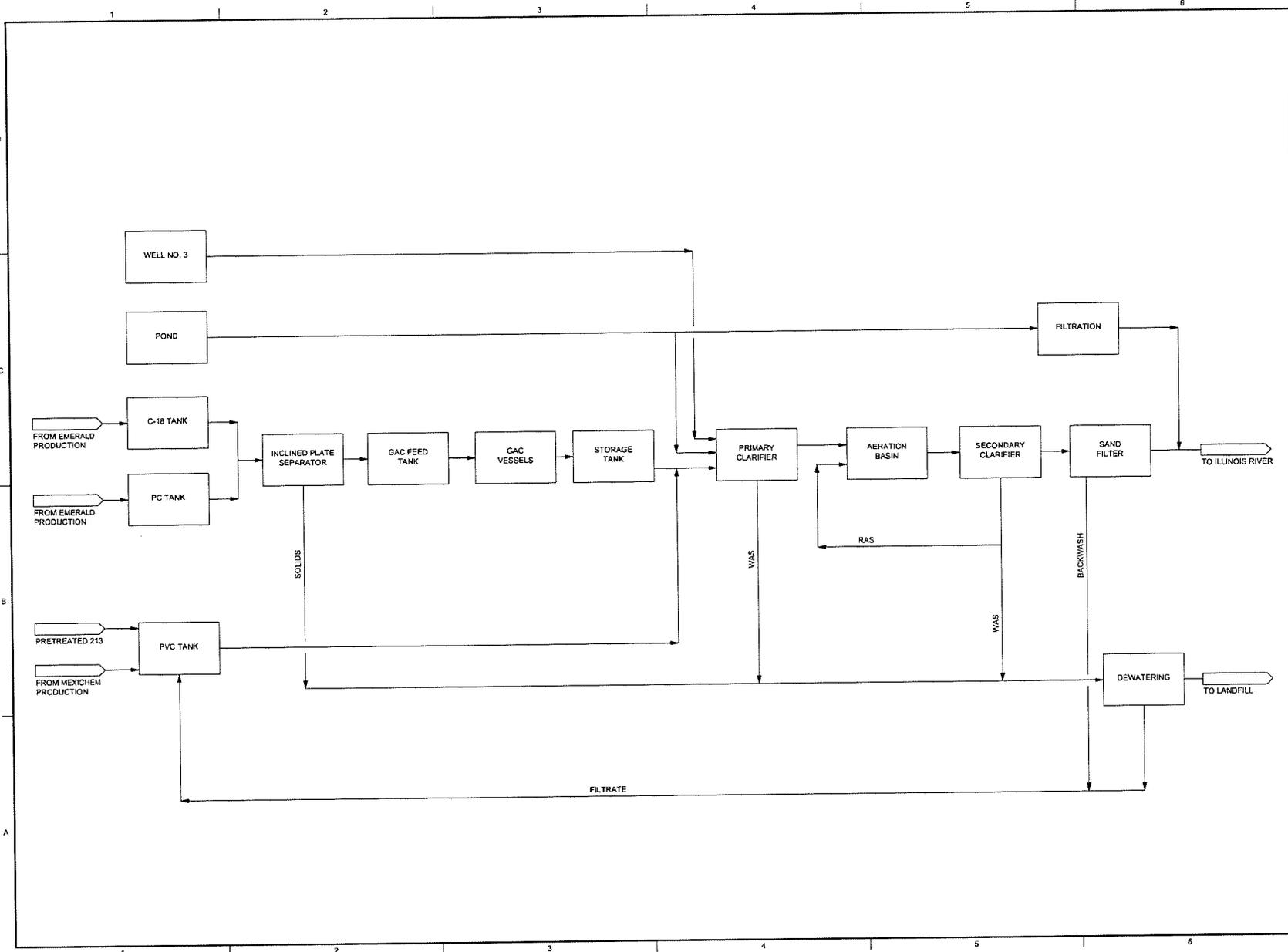
1. Please submit the following delinquent permit reporting requirements with the response to the VN. The following is the link to Wastewater Compliance Forms - <https://www2.illinois.gov/epa/topics/forms/water-forms/Pages/wastewater-compliance.aspx>

IL0001392

Schedule Desc	Event Desc	Event Comment	Sched Date
SPECIAL CONDITION 8	Annual Facility Inspection Report		08/01/2018

# **EXHIBIT 11**

P:\A\104101\PROJECTS\CLIENTS\EMERALD PERFORMANCE MATERIALS\SLURRY WASTEWATER\EMERALD PERFORMA...  
 FILENAME: G-101.DWG PLOT DATE: 05/20/14 12:11 PM CAD USER: ALEX EASTON



**Emerald Performance Materials**  
 HENRY, ILLINOIS

**EMERALD PERFORMANCE MATERIALS**

REVISIONS	
REV	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE  
 DESIGNED: \_\_\_\_\_  
 DRAWN: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_

**GENERAL**  
 SOLIDS SEPARATION AND GAC TREATMENT OF PC/C-18 WASTEWATER  
 DRAWING NUMBER: **G-101**  
 SHEET NUMBER: **OF**

Electronic Filing: Received, Clerk's Office 04/03/2019 \*\* AS 2019-002\*\*

# **EXHIBIT 12**

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

IN THE MATTER OF:	)	
	)	
Petition of Emerald Polymer	)	
	)	AS _____
Additives, LLC for an Adjusted	)	
	)	(Adjusted Standard)
Standard from 35 Ill. Adm. Code	)	
	)	
304.122(b)	)	

**AFFIDAVIT OF GALEN HATHCOCK**

I, Galen Hathcock, being duly sworn and upon oath, state as follows:

1. I am the Plant Manager of the facility located at 1550 County Road 1450 N., Henry, Illinois, operated by Emerald Polymer Additives, LLC.
2. In that position, I have personal knowledge of the facts set forth in the attached Petition for Adjusted Standard.
3. Having read the facts presented therein, I hereby state that to the best of my knowledge and belief the material facts set forth therein are true and accurate.

FURTHER AFFIANT SAYETH NOT.

  
 \_\_\_\_\_  
 Galen Hathcock

  
 \_\_\_\_\_ 4/1/19  
 Notary Public

