BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	AS 19-002
Petition of Emerald Polymer	)	
Additives, LLC for an Adjusted	)	(Adjusted Standard)
Standard from 35 Ill. Adm. Code	)	
304.122(b)	)	

To: See attached service list.

NOTICE OF ELECTRONIC FILING

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the RECOMMENDATION OF THE ILLINOIS ENVIRONEMNTAL PROTECTION AGENCY TO DENY PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD, for the above-captioned proceeding, a copy of which is herewith served upon you.

Respectfully submitted,

Dated: July 19, 2019

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Rex L. Gradeless
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RECOMMENDATION OF THE ILLINOIS ENVIRONEMNTAL PROTECTION AGENCY TO DENY PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA" or "Agency"), by and through its counsel, and pursuant to Section 28.1 of the Environmental Protection Act ("Act") (415 ILCS 5/28.1) and 35 Ill. Adm. Code 104.416, hereby recommends that the Pollution Control Board ("Board") DENY Emerald Polymer Additives, LLC's ("Petitioner") Petition for Adjusted Standard (Petition) requesting an adjusted standard over forty-six times greater than Illinois' standard. In support, the following statements are made:

I. INTRODUCTION

Petitioner filed a petition on April 3, 2019, requesting the Board grant Petitioner renewed relief from the discharge prohibition of effluent containing more than 3.0 mg/L of total ammonia nitrogen as N found in 35 Ill. Admin Code 304.122(b). Pet. 1. Petitioner petitions the Board for an adjusted standard for 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.[1] Further, and unlike Petitioner's previous adjusted standard granted by the Board in *Petition of Emerald Performance Materials, LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)*, AS 13-2 (Apr. 16,

[1] At the same time, Petitioner concedes that from April 16, 2015, through 2018, Petitioner's highest daily maximum ammonia nitrogen concentration in each year ranged from 100.0 to 130.0 mg/L with the highest daily maximum ammonia load ranging from 454.27 to 553.36 lbs/day. Over that same period, the highest 30-day average ammonia concentration in each year ranged from 85.62 to 101.81 mg/L, with a maximum load of 371.41 to 429.98 lbs/day. Pet. 6-7.

2015) ("AS 13-2"), Petitioner seeks to remove a five-year sunset provision and three other conditions. Pet. 27-28.

Section 28.1(d)(1) of the Act requires the Petitioner to publish notice of the petition by advertisement in a newspaper of general circulation in the area likely to be affected, and to provide proof to the Board of such publication. Petitioner filed its Notice of Publication on April 10, 2019, fulfilling the requirements of this Section.

On May 16, 2019, the Agency filed an unopposed motion for extension of time to file its recommendation so that its technical staff could review the items submitted by the Petitioner. On May 20, 2019, the Hearing Officer granted the Agency's motion and extended the Agency's deadline to file a recommendation to on or before July 19, 2019. On May 30, 2019, the Board accepted the petition for hearing and granted Petitioner's unopposed motion to incorporate the records of *Petition of Noveon, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.122*, AS 02-5 (Nov. 4, 2004) ("AS 02-5") and *Petition of Emerald Performance Materials, LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)*, AS 13-2 (Apr. 16, 2015) into the record.

On June 18, 2019, the parties met in Springfield, Illinois to discuss matters relevant to Petitioner's petition.

II. PROCEDURAL HISTORY AND BACKGROUND

The wastewater treatment plant at Petitioner's chemical manufacturing facility ("Henry Plant" or "Plant") is located on the west bank of the Illinois River, north of the City of Henry at 1550 Country Road, 1450 N., Henry Illinois. Pet. 1. In 1991, Petitioner's National Pollutant Discharge Elimination System Permit ("NPDES"), issued on December 18, 1990, was appealed (PCB 91-17) because the NPDES permit contained an effluent limitation of 3.0 mg/L for ammonia nitrogen based on Section 304.122(b). This appeal was stayed by agreement of the

parties. A variance petition for relief from Section 304.122 was filed October 30, 1992 (PCB 92-167), stayed by agreement of the parties, and withdrawn on June 20, 2002. A petition for an adjusted standard ("Initial Petition") was filed with the Board on May 22, 2002. *See* AS 02-5.

On September 16, 2004, the Board issued its Opinion and Order in the NPDES permit appeal, (PCB 91-17), and upheld the Agency's inclusion of the ammonia nitrogen effluent limit based on Section 304.122(b) in the permit. PCB 91-17, p. 10. On November 4, 2004, the Board issued its Opinion and Order on the Initial Petition granting Petitioner an adjusted standard from the ammonia nitrogen effluent limitation in Section 304.122(b). Under the adjusted standard, the ammonia nitrogen discharge from the Petitioner's facility could not exceed 155 mg/L. AS 02-5, p. 22. The Board found, *inter alia*, that the treatment process at the Petitioner's facility provided the Best Degree of Treatment (BDT), and that the discharge qualified for a mixing zone and a zone of initial dilution (ZID) pursuant Section 302.102. The Board, however, did not grant a mixing zone or a ZID as a part of the relief, but directed the Agency to define the mixing zone and ZID through the NPDES permit. AS 02-5, p. 19. 25. Further, the Board ordered the discharge to 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 ZID. AS 02-5, p. 22. Petitioner installed a multi-port diffuser on October 4, 2005.

On September 28, 2012, Petitioner filed a petition requesting that the Board renew its adjusted standard. AS 13-2. On April 16, 2015, the Board granted the Petitioner's petition subject to several conditions. *See* April 16, 2015, Opinion and Order, AS 13-2. The Board required, *inter alia*, the Petitioner to 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. *Id.* Petitioner appealed all or a portion of three conditions. 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).

III. FACTUAL BACKGROUND[2]

In 1990, the Henry Plant was owned by B.F. Goodrich. Pet. 2. In 1993, B.F. Goodrich divested its Geon Vinyl Division and formed the Geon Company, a separate, publicly held company who thereafter owned and operated the poly-vinyl chloride ("PVC") resin portion of the Henry chemical plant. *Id.* The PVC resin production plant was eventually bought by Mexichem Specialty Resins, Inc. ("Mexichem"), which operates that portion of the plant today. *Id.* In February 2001, B.F. Goodrich sold the Henry Plant, to Noveon, Inc. *Id.* 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"). *Id.* EPM owned and operated the Henry Plant from May 1, 2006, until EPM formed "Emerald Polymer Additives, LLC" (i.e. the Petitioner) in 2016. *Id.*

Based upon information and belief, Petitioner was created by, and is a subsidiary, of EPM. EPM is an affiliate of American Securities, LLC ("American"). American is a private equity company that invests in companies with annual revenues generally ranging from $200 million to $2 billion and/or $50 million to $250 million of earnings before interest, taxes,

[2] *See* Affidavits of Mark Liska and Scott Twait attached as Agency Exhibit 5.

depreciation, and amortization. American and its affiliates have approximately $14 billion in revenue and manage another $23 billion in assets. In order for the Henry Plant to make capital improvements, it must obtain approval from American. *See* Petitioner's corporate information attached as Agency Exhibit 1.

Petitioner employs approximately 66 people at the Henry Plant – a number that Petitioner has informed the Agency has decreased due to automation and increased efficiencies within the Plant. Pet. 15. Petitioner produces accelerators used in tires and other rubber goods and antioxidants used to inhibit oxidation in rubber, jet fuel, greases, oils and polypropylene. *Id.*

Petitioner's discharges wastewater effluent pursuant to NPDES Permit No. IL0001392l; this discharge contains the treated effluent from both Petitioner's specialty chemical facility and Mexichem's resin chemical facility. Pet. 6, 15. Petitioner's NPDES permit was renewed on October 1, 2016. Pet. Ex. 3. Between 2016 through 2018, Petitioner treated approximately 500,000 gallons per day of combined effluent from Mexichem's operation, Petitioner's operations and combined utility (City of Henry's publicly-owned treatment works) and potential contract storm water. Pet. 15, 19.

Petitioner uses sulfur, aniline, carbon disulfide and amines in the production of accelerators. The first step in the production is the manufacture of an intermediate product, sodium mercaptobenzothiazole (MBT). The intermediate product is then reacted with an amine and other raw materials to form an accelerator product. Pet. 15. In the production of antioxidants, Petitioner uses diphenylamine or one of several phenols as a starting material. The production process consists of batch and continuous reactors, filtration operations and solidification. Pet. 16. The Henry plant is the sole U.S. producer of the following accelerator chemicals: Cure-Rite 18, OBTS, and Morpholinyldithio Benzothiazole ("MBDS"). Pet. 16.

The wastewater treatment at the Henry Plant begins with the collection of wastewater from Petitioner and Mexichem in equalization tanks. *See* Petitioner's Flow Diagram attached as Agency Exhibit 2. Petitioner's waste stream is collected in the PC equalization tank and C-18 storage tank. *Id.* Mexichem's waste stream is collected in the PVC tank. *Id.*

In the primary treatment system, Petitioner's and Mexichem's separate waste streams are mixed together with non-process wastewater; the pH is adjusted, coagulant and flocculent are added, and then the wastewater is sent to the primary clarifier. *Id.*

The secondary treatment system consists of four activated sludge bioreactors with air blowers, and secondary clarification. Additional coagulant and flocculant are added and effluent from the secondary clarifier contains essentially no MBT and can be nitrified. *Id.*; Pet. 18. The bioreactors are tanks that range from 320,000 gallons to 1.0 million gallons and contain biomass to degrade the organic matter in the wastewater. *Id.* In 2013, Petitioner operated only two bioreactors. However, now Petitioner only operates one of its four bioreactors.

On or about December 30, 2013, Petitioner submitted its annual ammonia report to the Agency. *See* Pet. Ex. 5.

a. Petitioner indicated that the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to the wastewater treatment plant to help set priorities ammonia reduction projects. A review showed that one product from Building 725 was a major contributor of ammonia. The process for this product used excess t-butylamine. Therefore, efforts were started in 2013, and were to continue into 2014, to attempt to reduce excess t-butylamine within this product's process.

b. The Petitioner provided the Agency with four quarterly monitoring results of samples from the Illinois River: the sampling on March 28, 2013, indicated less than 0.10 mg/L

of ammonia nitrogen; the sampling on June 21, 2013, indicated less than 0.10 mg/L of ammonia nitrogen; the sampling on September 17, 2013, indicated less than 0.10 mg/L of ammonia nitrogen; and the sampling on November 14, 2013, indicated 0.17 mg/L of ammonia nitrogen.

On or about December 30, 2014, Petitioner submitted its annual ammonia report to the Agency. Pet. Ex. 5.

a. Petitioner again indicated that the last quarter of 2012, samples were taken from several process outfalls to determine the relative contribution of nitrogen to the wastewater treatment plant to help set priorities ammonia reduction projects. 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.

b. The Petitioner provided the Agency with four quarterly monitoring results of samples from the Illinois River: the sampling on March 26, 2014, indicated 0.20 mg/L of ammonia nitrogen; the sampling on June 26, 2014, indicated less than 0.10 mg/L of ammonia nitrogen; the sampling on September 23, 2014, indicated less than 0.10 mg/L of ammonia nitrogen; and the sampling on November 17, 2014, indicated less than 0.10 mg/L of ammonia nitrogen.

On or about January 6, 2016, Petitioner submitted its annual ammonia report to the Agency. Pet. Ex. 5.

a. Petitioner indicated that previous 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. Petitioner attributed this to both reduced production and better process management.

b. The Petitioner provided the Agency with four quarterly monitoring results of samples from the Illinois River: the sampling on March 25, 2015, indicated less than 0.10 mg/L of ammonia nitrogen; the sampling on June 25, 2015, indicated less than 0.10 mg/L of ammonia nitrogen; the sampling on September 17, 2015, indicated less than 0.10 mg/L of ammonia nitrogen; and the sampling on November 19, 2015, indicated less than 0.10 mg/L of ammonia nitrogen.

On or about April 27, 2016, Petitioner submitted its annual Adjusted Standard report to the Agency. Pet. Ex. 6.

a. Petitioner indicated that process improvement activities continued to identify the optimum excess t-butylamine 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. Petitioner had not identified any new treatment technologies.

b. Petitioner requested and received proposals for conducting additional studies of activated carbon treatment, spray irrigation, and addition of river water to facilitate nitrification. Petitioner identified consulting firms to conduct the studies.

On or about November 30, 2017, Petitioner submitted its annual Adjusted Standard report to the Agency. Pet. Ex. 6.

a. Petitioner claimed it continued to work towards process improvements to recover MBT in the production process. The facility engineering department was working in conjunction with production, health, safety, and environmental department, and two engineering firms, as

well as process improvement engineering from Petitioner's corporate services to establish administrative and process controls. Petitioner had not identified any new treatment technologies.

b. Petitioner reported that the Henry Plant contracted with engineering and consulting firms to conduct studies discussed in subsections 2(e)(i) and 2(e)(iii) of the Board's order in AS 13-2. As for the study in section 2(e)(ii) of the Board's order in AS 13-2, Petitioner raised concerns about conducting the spray irrigation study and federal law.

On or about April 17, 2018, Petitioner submitted an update report to the Agency. *See* Petitioner's April 17, 2018, letter attached as Agency Exhibit 3.

a. Petitioner indicated that the Henry Plant put together a continuous process improvement project team to identify and evaluate potential modifications of the processes and product recipes to recover MBT as well as organic nitrogen compounds within Petitioner's products.

b. Petitioner indicated pretreatment of Plant wastewater using granulated activated carbon ("GAC") to remove MBT was evaluated by Brown & Caldwell ("B&C"). B&C found that GAC would sufficiently reduce MBT concentrations to allow the microorganisms in the plant wastewater treatment system to achieve adequate nitrification.

c. Instead of complying with the Board's order to conduct a study to evaluate the technical feasibility and economic reasonableness of a spray irrigation program, Petitioner opines that a spray irrigation program is not feasible because the agronomic rate for 80 acres of crops can be supplied in 20 days if Petitioner discharged its entire effluent onto 80 acres. This conclusion ignores the possibility of application on additional acres of land, seasonal applications, incremental use of its effluent, and future process improvements. Petitioner never

conducted a study. Spray irrigation, even when intermittent, would be one way of providing incremental reductions in Petitioner's ammonia discharge even though it might fail to meet the 3 mg/L limit in Section 304.122.

d. Treatment of plant wastewater via river water dilution was evaluated at by B&C and B&C found that nitrification could be achieved.

e. However, Petitioner concluded all alternatives were too expensive.

Petitioner represented to the Agency that in the fall of 2018, Petitioner improved the reaction of its MBDS processes. This resulted in a decrease in Petitioner's MBT discharge. Between September 2018 and May 2019, and according to Petitioner's daily monitoring reports ("DMRs"), Petitioner reported daily maximum ammonia of no more than 110 mg/L with highest 30-day average of ammonia of no more than 89.9 mg/L.

IV. PETITIONER'S COMPLIANCE WITH AS 13-2

Adjusted Standard

Petitioner concedes its current adjusted standard (140 mg/L and 1,633 pounds/day (lbs/day) maximum and 30-day average of 110 mg/L and 841 lbs/day) is too high. From April 16, 2015 through 2018, Petitioner's highest daily maximum ammonia nitrogen concentration in each year ranged from 100.0 to 130.0 mg/L with the highest daily maximum ammonia load ranging from 454.27 to 553.36 lbs/day. Over that same period, the highest 30-day average ammonia concentration in each year ranged from 85.62 to 101.81 mg/L, with a maximum load of 371.41 to 429.98 lbs/day. Pet. 6-7. Moreover, and after Petitioner increased internal efficiencies, between September 2018 and May 2019, Petitioner has not exceeded a daily maximum of 110 mg/L and 553 lbs/day. Over that same period, Petitioner's 30-day average has not exceeded 89.9 mg/L and 475 lbs/day. Petitioner has easily complied with its current adjusted standard – a

standard 46.6 times greater than the State standard.

Conditions to Adjusted Standard

Conditions 2(a) and 2(b): Based upon information and belief, the Agency agrees that Petitioner has maintained the high-rate, multiport 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.

Conditions 2(c) and (d): Based upon information and belief, the Agency believes Petitioner has put together a "continuous process improvement project team" to identify and evaluate potential modifications of the processes and product formulations to recover MBT and organic nitrogen compounds. However, it is unclear to the Agency how often this team meets, what specific production methods and specific treatment technologies, if any, have been discussed, and what, if any, options have genuinely been considered by Petitioner. Further, the Agency is unaware of whether options of not discharging MBT into the Illinois River has been evaluated by Petitioner. Petitioner informed the Agency that it was looking to improve its control and reaction processes at Henry Plant and, therefore, a capitol renovation project to put the west bioreactor back online was underway. Pet. 7. However, Petitioner has not provided the Agency with capital cost information for the west bioreactor renovation project.

Condition 2(e)(1): This condition required Petitioner to conduct 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 was required to include a technical feasibility evaluation and an economic

reasonableness analysis. Petitioner appears to have complied with this condition. However, the Agency disagrees with Petitioner's conclusions for the reasons stated in Section VI below.

Condition 2(e)(2): For the reasons stated in Section VI below, Petitioner ignored this condition of the Board's order to conduct a spray irrigation study.

Condition 2(e)(3): Required Petitioner to conduct 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 was to include a technical feasibility evaluation and an economic reasonableness analysis. Petitioner appears to have complied with this condition. However, the Agency disagrees with Petitioner's conclusions for reasons stated in Section VI below.

Condition 2(f) and 2(g): Petitioner has complied with this condition and provided the Agency with annual reports. The Agency has not petitioned the Board for consideration of any new technology to treat ammonia.

Condition 2(h): Petitioner was required to operate in full compliance with the Clean Water Act, its NPDES permit, the Board's water pollution regulations, and any other applicable requirement. Petitioner received three violation notices since January 1, 2012. The first violation notice was for Petitioner's violations of NPDES numeric limits for BOD (2/28/2013, 3/31/2013, 4/30/2013, and 5/31/2013), fecal coliform (2/28/2013, 3/31/2013, and 4/30/2013), total suspended solids ("TSS") (3/31/2013), chlorobenzene (3/31/2013), and Petitioner's violation of its ammonia nitrogen limit (1/31/2013). Petitioner received a compliance commitment agreement. The second violation notice was for Petitioner's violations of NPDES numeric limits for total cyanide (3/31/2015), total phenolics (3/31/2015), chlorobenzene (3/31/2015), TSS (4/30/2015) and carbonaceous BOD (4/30/2015 and 5/31/2015). Petitioner received a second

compliance commitment agreement. Finally, the third violation notice was for Petitioner's violations of NPDES numeric limits for TSS (8/31/2018, 9/30/2018, 10/31/2018, 11/30/2018 and 1/31/2019), fecal coliform (8/31/2018, 9/30/2018, 10/31/2018), and failure to comply with reporting requirements (8/1/2018). This matter has not been resolved.

V. STANDARD FROM WHICH RELIEF IS SOUGHT

Section 304.122(b) provides a total ammonia nitrogen effluent limitation for the Illinois River of 3.0 mg/L for sources 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). 35 Ill. Adm Code 304.122(b) (Amended at 26 Ill. Reg. 16948, effective November 08, 2002). This is the standard from which Petitioner seeks relief.

On May 30, 2019, the Board granted Petitioner's unopposed motion to incorporate the records of *Noveon*, AS 02-5 and *Emerald Performance*, AS 13-2 into the record. However, Petitioner has not filed, as required by 35 Ill. Adm. Code 101.306(a), the material to be incorporated with the Board in accordance with Section 101.302(h). *Id.* Under the procedural rules, the person seeking the incorporation must demonstrate to the Board or the hearing officer that the material to be incorporated is authentic, credible, and relevant to the proceeding. *Id.* To the extent Petitioner has incorporated every single contention and every single argument contained within these two records, many of these facts and or issues would likely no longer be relevant. In sum, it is unclear what the Petitioner intends to incorporate, and Petitioner has failed to update any of the material submitted in the past, including cost figures.

The Board may take notice of "matters of which the circuit courts of this State may take judicial notice" and "generally recognized technical or scientific facts within the Board's

specialized knowledge [and experience]." 5 ILCS 100/10-40(c) (West 2015); 35 Ill. Adm. Code 101.630. However, in proceedings before the Board, the parties must be notified of the use of the extraneous evidence and afforded an opportunity to respond. 5 ILCS 100/10-40(c) (West 2015). An administrative agency may only take official notice of facts when they are disclosed and put on the record, so the parties may be afforded an opportunity to be heard. *Caterpillar Tractor Co. v. Pollution Control Board*, 48 Ill. App. 3d 655, 661-62 (1977). Here, Petitioner has simply referred to the docket sheets and stated that the records are "largely" available online. Pet. Mot. p. 3. Petitioner should file with the Board within this docket what specific records it wishes to incorporate. For example, in *Sanitary District of Decatur v. IEPA*, 2014 WL 936139, the Board granted a motion to allow a party to file a single copy of the record from another proceeding.

Finally, and the extent all facts from both AS 02-5 and AS 13-2 are incorporated in this proceeding, the Agency notes that incorporated facts do not necessarily bind the Board to any finding because 1) parties are required to be informed of the material that will be officially noticed and 2) parties must be given the opportunity to contest that material. 5 ILCS 100/10-40(c). As stated above, the Agency does not know what specific materials Petitioner desires to incorporate. Thus, and for example, facts and figures from 2002 may no longer be relevant or accurate in 2019. Nonetheless, the Board has the absolute authority to give incorporated matters (whatever they may be in this case) their appropriate weight while considering: 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 for cross-examination of the matters asserted within the incorporated material. 35 Ill. Adm. Code 101.306(b) (Emphasis Added.). To the extent matters within the incorporated records have become stale or outdated, they should be given little to no weight under 35 Ill. Adm. Code 101.306(b).

VI. EFFORTS NECESSARY TO ACHIEVE COMPLIANCE

Section 104.406(e) requires the Petitioner to describe all the compliance alternatives available to the Petitioner that reduce the discharge of ammonia nitrogen to 3 mg/L. This discussion must include the cost of each alternative, the overall capital costs and the annualized capital operating costs. In its Petition, Petitioner reviewed some treatment alternatives but incorrectly concludes they are not technologically feasible and economically reasonable.

As an initial matter, Petitioner failed to re-evaluate all compliance alternatives. The Agency recommends the Petitioner reexamine each alternative it has ever presented to the Board. Costs associated with alternatives can fluctuate over time as well as the Petitioner's financial ability to make capital improvements. These fluctuations can make an alternative economically reasonable or unreasonable. Additionally, changes in technology over time can also make alternatives technologically feasible or unfeasible. Petitioner must always provide incremental reductions in ammonia even though it would fail to meet the prescribed 3 mg/L limit in Section 304.122 and revaluating each alternative, and their costs, is a part of that process.

First, Petitioner's study of GAC pretreatment of plant wastewater showed it would sufficiently reduce MBT concentrations to allow the microorganisms in the plant wastewater to achieve adequate nitrification. B&C concluded, based on the new equipment and construction needed for this alternative, the expected total capital cost would be $5,274,00 with a range from $2,637,00 (-50%) to $10,548,000 (+100%). Petitioner concludes this alternative would be too expensive pointing to these costs as "20 times higher than the costs incurred by municipal publicly-owned treatment works ("POTWs") in Illinois and 11 times higher than the average cost of municipal POTWs nationwide".

Petitioner's conclusion excludes any information about its revenues, profits, or operating

costs. In other words, the economic reasonableness for a POTW may be different from the economic reasonableness of a private company. Further, this conclusion ignores the fact that, unlike the Petitioner, municipal POTWs in Illinois do not currently have an adjusted standard 46.6 times greater than current State standard. In other words, Petitioner's ammonia discharges are exponentially greater than the ammonia discharges of municipal POTW's. Therefore, proportionally, this alternative may be considered economically reasonable. Petitioner failed to conduct a complete economic reasonableness analysis.

Further, Petitioner's statement that this 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" is misleading. Here, instead of taking the actual projected capital costs of this alternative (i.e. $5.3 million), B&C uses the "present worth cost" of $27 million and calculates costs per pound of removal. *See* Pet. Ex. 6, p. 14 of B&C alternatives analysis report. Then the misleading comparison is made between the "present worth cost" of the proposed alternative and the actual capital costs of a low cost capital projects reported by POTWs in 2015.

Next, Petitioner evaluated a river water dilution alternative and determined the alternative was not technically feasible or economically reasonable for three reasons: (1) the alternative was too expensive, (2) the alternative was not likely to achieve the desired ammonia removal; and (3) the ancillary environmental impacts outweigh reduction in the ammonia discharged.

B&C found that nitrification could be achieved if the plant wastewater were diluted by 90% with river water. B&C also evaluated the cost of this alternative and estimated, based on 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%). Petitioner concludes this alternative would be too expensive pointing to these costs as "40 times higher

than the costs incurred by municipal POTWs in Illinois and 21 times higher than the average cost of municipal POTWs nationwide".

Again, Petitioner excludes any information about its revenues, profits, or operating costs. In other words, the economic reasonableness for a POTW may be different from the economic reasonableness of a private company. Petitioner's conclusion ignores the fact that, unlike the Petitioner, municipal POTWs in Illinois do not currently have an adjusted standard 46.6 times greater than current State standard. Petitioner's ammonia discharges are exponentially greater than the ammonia discharges of municipal POTW's. Again, the statement that this alternative 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" is misleading for the same reasons mentioned above. Instead of capital costs, Petitioner uses "the present worth cost" of $54 million in the calculation – completely ignoring the bottom range of projected capital costs. Proportionally, this alternative may also be considered economically reasonable. Petitioner failed to conduct a complete economic reasonableness analysis.

Petitioner claims that diluting 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. Petitioner states 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.

Finally, Petitioner claims to have investigated a spray irrigation alternative as required by the Board's order in AS 13-2. Petitioner concludes that because crop irrigation and nitrogen

needs do not occur continuously through the growing season that this option is not technically feasible. Additionally, Petitioner claims that Section 372.110(a) allows for "land application of secondary and tertiary treated domestic wastewater" and therefore does not authorize the land application of industrial wastewater, which might violate federal restrictions on the land disposal of wastes.

The Agency disagrees with the Petitioner's "all or nothing" contention that just because the Plant's discharge occurs throughout the year with ammonia levels that fluctuate with production that precludes this alternative. In fact, this was precisely the argument the Board previously rejected in AS 13-2 when the Board stated: "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 13-2, p. 49. Furthermore, spray irrigation, under very similar circumstances, has been approved in Illinois. For example, Akzo Nobel Surface Chemistry, LLC utilizes spray irrigation of treated process wastewater, sanitary wastewater, and stormwater through their NPDES permit (IL0026069)[3].

Therefore, the Agency recommends that the Petitioner submit a state operating permit application to the Agency for spray irrigation and implement a spray irrigation program, subject to any appropriate and additional NPDES permit conditions, to reduce the amount of ammonia discharged into the Illinois River. In lieu of immediately implementing a spray irrigation

[3] Sanitary effluent is treated prior to entering the main biological treatment and is then either spray irrigated (Spring, Summer, and Fall) or collected in settling and aeration basins (Winter). All other wastewaters are sent directly to the main biological treatment system and then to a 65-acre spray field. Water is collected from the sprayfield using an underdrain and then discharged via outfall 001. During winter operations water is held in the lagoons until spray irrigation can resume in the spring.

program, Petitioner must conduct a study that, at a minimum, evaluates 1) when the Petitioner can spray irrigate, 2) the suitability of Petitioner's effluent on vegetation, 3) the costs of implementing a spay irrigation program, 4) the quantity of land available to accept spray irrigation, and 5) the agronomic benefits of the spray irrigation program.

The Petitioner's claim that 35 Ill. Adm. Code 372.110(a) precludes land application is a misreading of Section 372.110(a). Section 372.110(a) provides that the applicability of Part 372 includes design standards that apply to non-discharging low-rate land application of secondary and tertiary treated domestic wastewater to land upon which crops, turf or trees are grown. However, this Section does not preclude industrial wastewater application on land upon which crops, turf or trees are grown. Part 372 simply provides the design standards for domestic application. Further, and as mentioned above, the Agency allows for industrial application.

VII. LEVEL OF JUSTIFICATION REQUIRED

Section 302.122(b) does not provide a specific level of justification required by the Petitioner to obtain an adjusted standard. Therefore, pursuant to Section 28.1(c) of the Act, the level of the justification requires the Petitioner to present adequate proof of the following:

(1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

(2) the existence of those factors justifies an adjusted standard;

(3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

(4) the adjusted standard is consistent with any applicable federal law.

If any one of the four elements have not been adequately proven, the Board must deny the adjusted standard.

VIII. PETITIONER'S JUSTIFICATION

1. Substantially Different Factors

The factors the Board relied on in adopting an ammonia nitrogen effluent limit include (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 3mg/L limit. Pet. 30. Petitioner argues that while technology exists to treat discharges to meet the ammonia nitrogen limit, these technologies are not both technologically feasible and economically reasonable when applied to Petitioner's discharge. *Id.* The Board has held that Petitioner's discharge has unique characteristics making the Plant unable to achieve nitrification, which makes Petitioner different from other industries and POTWs. Pet. Ex 1 at 40. The treatment process at the Henry Plant generates large amounts of ammonia nitrogen during secondary treatment because of the presence of degradable organic nitrogen compounds. *Id.* The presence of MBT which inhibits the growth of nitrifying bacteria, and the low levels of alkalinity require the addition of alkalinity to achieve nitrification. *Id.*

The nature of Petitioner's discharge has not changed since the Initial Petition, in that its discharge still contains MBT. Petitioner 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 this standard. The technologies articulated by Petitioner in its Petition were in existence when the Board adopted Section 304.122(b). Furthermore, the Petitioner can achieve nitrification after its secondary clarifies but is, for whatever reason, willfully choosing not to do so.

2. Adjusted Standard Justification

Petitioner correctly asserts that the Board must consider economic reasonableness when adopting regulations. Section 27 of the Act provides: "The Board shall take into account . . . the

technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution." Economic reasonableness alone, however, is not an element in the required level of justification to obtain an adjusted standard as set forth in Section 28.1(c) of the Act.

Before cost of treatment becomes a factor in an adjusted standard petition, the Petitioner must 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. The existence of MBT in Petitioner's waste stream does not justify the Board's granting of an adjusted standard because the cost of treatment of ammonia is not substantially and significantly different for Petitioner than for other wastewater treatment plants that do not contain MBT in its waste stream. Petitioner presents no evidence that the cost of treating its effluent for ammonia nitrogen is higher than the costs expended by a statistically significant sample of Illinois POTWs or, and more relevantly, other industrial plants with similar amounts of ammonia discharge, or higher than the costs contemplated by the Board when adopting Section 304.122. The Petitioner must provide this analysis to the Board.

The Agency has been able to determine that the capital costs are comparable or lower than the capital costs expended by POTWs[4]. For example: In January 1998, Geneva proposed to pay a capital cost $8.4 million to reduce 1,042 lbs/ day of ammonia in its effluent. In February 2002, Batavia proposed to pay a capital cost of $6 million to reduce 875.7 lbs/day of ammonia in its effluent. In April 2002, St. Charles proposed to pay a capital cost of $8.4 million to reduce 976 lbs/day from it effluent. In 2017, the Kishwaukee Water Reclamation District proposed a $53 million project to, *inter alia*, provide a new activated sludge process to meet ammonia limits that included a new separate treatment of WAS thickening filtrate and dewatering centrate (sidestream treatment) to reduce ammonia loads. In 2017, the Village of Newark proposed a $3

[4] Not adjusted for inflation.

million project to provide ammonia removal. In 2018, the Fox River Reclamation District proposed $2 million project to build two 400,000-gallon capacity flow equalization tanks to control the amount of ammonia containing filtrate that was returned to the beginning of its secondary treatment process. In 2018, Mount Carmel proposed $1.6 million project to fund new fine bubble aeration equipment to allow the city to achieve compliance with the ammonia limits.

The capital costs for POTWs to treat ammonia are comparable to Petitioner's previous estimates for capital costs for alkaline air stripping of the secondary clarifier effluent: $9.4 million; single-stage nitrification of non-PC wastewater: $2.68 million; biological nitrification of combined wastewater: $4.4 million; break point chlorination: $1.4 million; ion exchange: $1.6 million; GAC pretreatment: $5.2 million; and dilution with river water system: $22 million. Petitioner's figures for several of the proposed alternatives are within the range of the comparable POTW's cost, and it should be expected to pay the same costs as others in the industry – especially given the amount of ammonia Petitioner discharges into the Illinois River.

Finally, Petitioner has not submitted any financial information. Without this information, the Agency finds it problematic to evaluate economic reasonableness of any of the alternatives for the Petitioner. Petitioner failed to conduct an economic reasonableness analysis on each alternative and, therefore, Petitioner has failed to meet its burden of proof under Section 28.1(c)(2) of the Act. Additionally, cost estimates, some submitted almost a decade ago assuming *arguendo* Petitioner is attempting to incorporate previous costs estimates from AS 02-5, have an accuracy level of ± 50%, suggesting the estimates provided could be as much as 50% less than shown. Petitioner must provide the Board with its financial balance sheets for fiscal years 2015, 2016, 2017, 2018, and 2019; any annual shareholder reports for fiscal years 2017, 2018, and 2019; a breakdown of Petitioner's current assets and liabilities; a breakdown of

Petitioner's expenses, including operation and maintenance costs, for fiscal years 2015, 2016, 2017, 2018 and 2019; and Petitioner's projected annual operation and maintenance costs for 2020, 2021, 2022, 2023, and 2024. Failure to fully analyze the economic reasonableness of each alternative is reversable error, Petitioner must provide the analysis to the Board. Therefore, the Petition for adjusted standard should be denied.

3. Environmental or Health Impacts

Petitioner argues that there will be 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 summer acute and chronic standards at the edge of the mixing zone. 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. 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 Petitioner's requested adjusted standard would not cause negative environmental or health impacts and the Appellate Court upheld that finding. *See* AS 13-2, p. 61-62; *Emerald Performance Materials v. IPCB and IEPA*, 2016 IL App. (3d) 150526, 1130-31. However, the Agency is concerned, as it was in AS 13-2, about the whole effluent toxicity (WET) within Petitioner's effluent. Besides the toxicity from ammonia, there are other substances that are likely toxic to aquatic life. These substances are those, at least, that Petitioner claims interferes with nitrifying bacteria and prevents them from removing ammonia from its effluent. A test conducted in 2017 showed a LC50 result of 3.87%, which is technically permissible given the amount of mixing Petitioner has been given. However, the results of this test leave the amount of dilution required to achieve a non-toxic condition undetermined. In the

present day, LC5O values this toxic are not found at any other Illinois facility.

As the Agency has argued before, a mixing zone is improper because Petitioner is not providing the best degree of treatment. Over the expansive history of this adjusted standard, Petitioner has presented several alternatives that achieve 100% or less ammonia reduction, with correspondingly lower costs. Petitioner has the tools available to it to substantially lower its ammonia nitrogen concentration in its effluent but overtly fails to act to do so. Illinois EPA strongly encourages the Board to require Petitioner to implement ammonia reductions rather than granting the relief requested by Petitioner. Petitioner has failed to meet its burden of proof under Section 28.1(c)(3) of the Act and its petition should be denied.

4. Consistency with the Federal Law (104.406(i))

Before the Board may grant an adjusted standard, the Petitioner must have submitted adequate proof that the adjusted standard is consistent with any applicable federal law. 415 ILCS 5/28.1(c)(4); 35 Ill. Adm. Code 104.426. In ruling on the Initial Petition, the Board found that the adjusted standard was not inconsistent with federal law. The Agency agrees.

IX. HEARING

Petitioner requests a hearing in this matter and the Agency has no objection. The Agency requests the Petitioner provide without subpoena, at a minimum, the following witnesses for examination at the hearing:

1) Galen Hathcock, Henry Plant Director, Emerald Performance Materials, LLC;
2) Lance Richards, Environmental Manager, Emerald Performance Materials, LLC;
3) Mark Winter; Emerald Performance Materials, LLC;
4) Chris Wrobel, Global EHS&S Manager at Emerald Performance Materials, LLC;
5) Scott Wolff, Chairman of the Board, Emerald Performance Materials, LLC; and

6) Ben Dickson, Director, Emerald Performance Materials, LLC.

The Agency agrees to provide without subpoena, at a minimum, the following witnesses:

1) Scott Twait, Manager, Water Quality Standards, Division of Water Pollution Control, Bureau of Water;

2) Mark Liska, Environmental Protection Engineer, Industrial Permits, Bureau of Water; and

3) Darin LeCrone, Manager, Industrial Permits, Division of Water Pollution Control, Bureau of Water

Additionally, the Agency requests the Hearing Officer, pursuant to 35 Ill. Adm Code 101.610(m), grant the Agency leave to conduct discovery on the Petitioner. Further, the Agency requests the Board's Clerk issue discovery subpoenas to the Agency to be served on Mexichem Specialty Resins, Inc. to produce books, papers, documents, or other tangible things designated therein relevant to this matter. 35 Ill. Adm Code 101.622 (c). Finally, the Agency requests the Board designate Mexichem Specialty Resins, Inc. a Respondent in Discovery for this matter pursuant to 735 ILCS 5/2-402.

X. RECOMMENDATION AND CONCLUSION

WHEREFORE, for the reasons stated herein, Illinois EPA respectfully recommends that the Board DENY Petitioner's Petition for Adjusted Standard. Petitioner has not met its burden of proof to obtain an adjusted standard. In the event the Board decides to grant Petitioner's requested adjusted standard over the Agency's objection, the Agency recommends the following:

1. Due to conceded changes within Petitioner's MBDS process since the fall of 2018, and taking the highest values within Petitioner's DMRs between September 2018 and May 2019, any adjusted standard granted by the Board should not exceed a daily maximum of 110 milligrams per liter (mg/L) and no more than 553 pounds per day ("lbs/day") and Petitioner's 30-

day average should not exceed 89.9 mg/L and no more than 475 lbs/day.[5]

2. Any adjusted standard granted by the Board should not be effective for any longer than 5 years after the Board's order because a sunset provision "is appropriate and a valid means to inspire Emerald to attempt to comply with the pollution regulations." See *Emerald Performance Materials v. IPCB and IEPA*, 2016 IL App (3d) 150526 (¶41).

3. Incentives for compliance should be the hallmark of any adjusted standard granted by the Board. Any interim standard should require the Petitioner to always provide, and always seek to provide, incremental reductions in ammonia even when it may fail to meet the prescribed 3 mg/L limit in Section 304.122. Therefore, any interim adjusted standard granted by the Board should also be subject to all the following conditions:

a. Within 90 days of the Board's order, Petitioner must quantify the amount of ammonia attributable to Mexichem entering Petitioner's treatment plant and provide that information to the Agency.

b. Petitioner must provide the Agency with 1) its financial balance sheets each fiscal year following the Board's order, 2) all annual shareholder reports for each fiscal year following the Board's order; 3) a breakdown of Petitioner's assets and liabilities for each fiscal year following the Board's order; 4) a breakdown of Petitioner's expenses, including operation and maintenance costs for each fiscal year following the Board's order, and the Petitioner's projected annual operation and maintenance costs for each fiscal year following the Board's order.

c. Within 90 days of the Board's order, given the effluent from Petitioner's secondary clarifiers contain essentially no MBT and can be nitrified, Petitioner must

[5] This recommendation serves only as a ceiling for any adjusted standard granted by the Board. This should not be construed as the Agency changing its previous position that a lower standard is more appropriate to compel the Petitioner to act. *See* Agency Recommendation in AS 13-02.

investigate and provide to the Agency how much treatment capacity it needs prior to and following the secondary clarifiers to complete nitrification. Further, Petitioner must reconfigure its current treatment system (e.g. with low cost economically reasonable piping) and bioreactor tanks to treat the effluent after the secondary clarifier to achieve nitrification.

d. Within 180 days of the Board's order, Petitioner must investigate and quantify the amount of ammonia and MBT coming into the PVC Tank, the C-18 Tank, and the PC Tank and submit this data to the Agency. Petitioner must propose methods to minimize these parameters from each of these places within one year along with a schedule to implement the proposed changes.

e. On or before July 19, 2020, Petitioner must evaluate ammonia and water reductions attributable to Mexichem entering Petitioner's treatment plant and provide that information to the Agency.

f. On or before July 19, 2020, Petitioner must evaluate ammonia and water reductions attributable to Petitioner entering Petitioner's treatment plant and provide that information to the Agency.

g. On or before July 19, 2021, Petitioner must submit results of a spray irrigation study to the Agency. Before conducting the study, the Petitioner must submit a study proposal to, and receive approval from, the Agency. The spray irrigation study, at a minimum, must thoroughly analyze 1) when the Petitioner can spray irrigate, 2) the suitability of Petitioner's effluent on vegetation, 3) the costs of implementing a spay irrigation program, 4) the quantity of land available to accept spray irrigation, and 5) the agronomic benefits of the spray irrigation program. If found feasible, Petitioner must

submit a state operating permit application to the Agency for conducting spray irrigation.

h. Given Petitioner currently only operates one of its four bioreactors and is currently renovating one bioreactor, Petitioner must 1) repair, operate, and maintain no less than two of its bioreactors within 18 months of the Board's order, 2) repair, operate, and maintain no less than three of its bioreactors within 3 years of the Board's order, and 3) repair, operate, and maintain all four of its bioreactors within 4 years of the Board's order. Petitioner must annually provide the Agency with its number of operating bioreactor tanks and its tankage capacity for each tank.

i. Petitioner must provide the Agency with actual annual capital improvement costs for its bioreactors each fiscal year following the Board's order.

j. Petitioner must continue to investigate improvements to the reaction processes of all its processes. Petitioner must provide the Agency with an annual report detailing any improvements made to its reaction processes and detail any plans to improve the reaction processes. The annual report must include capital costs or expected capital costs for improvements to these processes.

k. Petitioner 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.

l. Petitioner must, at a minimum, maintain the following ammonia reduction measures: maintenance of the BBTS Wet Scrubber with a dust collector; and maintain upgrades to the instrumentation of the acetonitrile recovery column.

m. Petitioner must annually investigate new production methods and

technologies that generate less ammonia and nitrification inhibitors in Petitioner's discharge. Where practicable, Petitioner must substitute current production methods or technologies with new ones so long as the substitution generates less ammonia in Petitioner's discharge.

n. Petitioner must annually investigate new treatment methods and technologies prior to or following the secondary clarifier, including but not limited to Algaewheel® technology (*See* Algaewheel® information attached as Agency Exhibit 4), and annually evaluate implementation of new and existing treatment technology based on current plant conditions. Where practicable, Petitioner must substitute current treatment methods or technologies with new ones so long as the substitution generates less ammonia in Petitioner's discharge.

o. Petitioner must conduct quarterly monitoring of ammonia nitrogen in the Illinois River (within no more than 10 feet from the edge of the mixing zone (300 feet from the diffuser)) to demonstrate compliance with the ammonia water quality standards in accordance with 35 Ill. Adm. Code 302.212.

p. Petitioner must prepare and submit to the Agency annual reports, including an executive summary, summarizing all activities to comply with paragraphs 3(a) through 3(o).

q. Based upon review of the annual reports required by condition 3(p), the Agency may petition the Board to modify the relief granted by the Board's order.

r. Petitioner 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.

The Agency reserves the right to modify its above Recommendations as new information becomes available through discovery and at the hearing.

Respectfully submitted,

Dated: July 19, 2019

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Respondent,

BY: /s/Rex L. Gradeless
Rex L. Gradeless

Rex L. Gradeless, #6303411
Division of Legal Counsel
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1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
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Rex.Gradeless@Illinois.gov

Exhibit List

Exhibit 1 – Petitioner's corporate information

Exhibit 2 – Petitioner's flow diagram

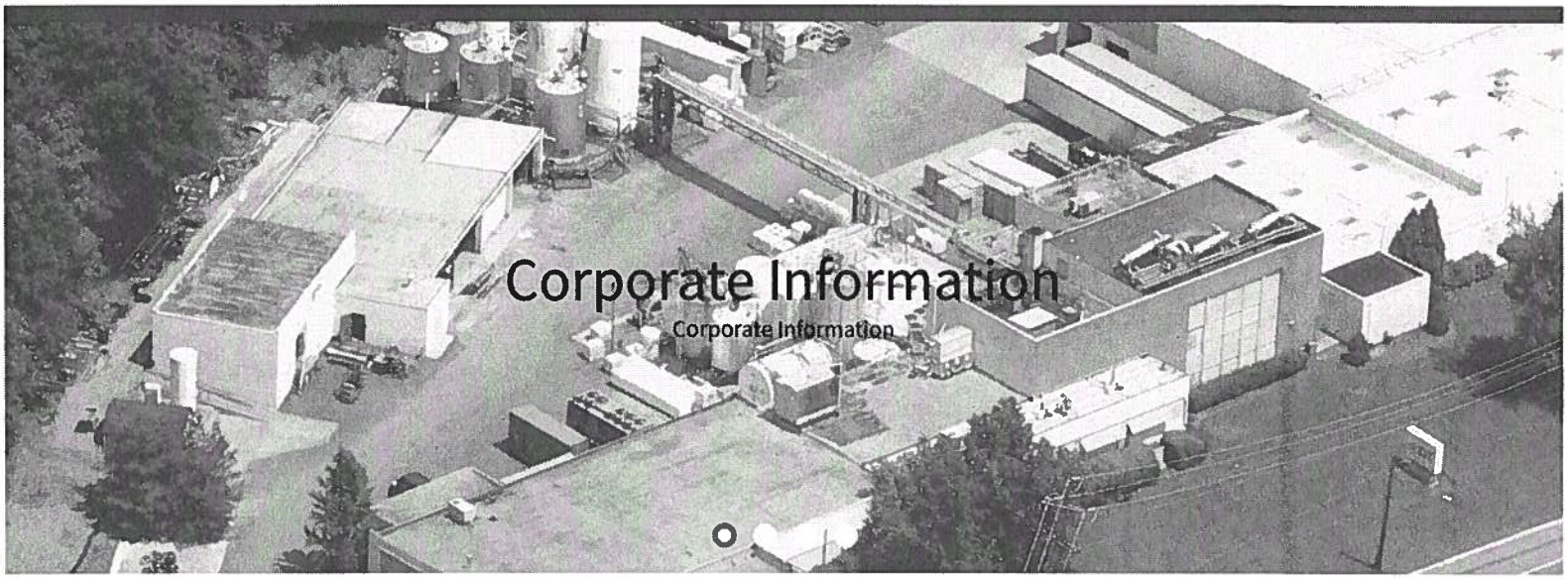
Exhibit 3 – Petitioner's April 17, 2018, letter to Agency regarding alternatives

Exhibit 4 – Algaewheel® information

Exhibit 5 – Affidavits Mark Liska and Scott Twait

Emerald Performance Materials®

(https://emeraldmaterials.com)



Emerald Performance Materials

Emerald® solutions deliver extraordinary performance, value, quality and applications expertise to our customers. More than 700 employees at six operations around the world work with you to develop and manufacture high-quality specialties for consumer and industrial products.

EXHIBIT
1

OUR HISTORY

Emerald Performance Materials formed in 2006 with a foundation of businesses divested from well-known and respected companies such as BF Goodrich, Lubrizol and DSM. Since 2006, Emerald has expanded its portfolio, expertise, and global reach with acquisitions such as:

- CVC Specialty Chemicals (2008)
- DSM Specialty Products and its operation in Rotterdam, The Netherlands (2012)
- Innospec Widnes Ltd. and its operation in Widnes, United Kingdom (2015)

Today, Emerald is an affiliate of American Securities LLC. American Securities is a mid-sized private equity company committed to growing the business and enabling the company to better serve our customers.

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OUR OPERATIONS

Phone: 1(856) 533-3000, 360-954-7100

Emerald Performance Materials LLC

Emerald Performance Materials, LLC produces and markets specialty chemical products. The Company offers sulfated oils, water repellents, waxes, epoxy resins, foam control additives, dyes, and silicone based products. Emerald Performance Materials serves customers worldwide.

SECTOR	INDUSTRY	SUB-INDUSTRY	FOUNDED
Materials	Chemicals	Specialty Chemicals	03/03/2006

ADDRESS	PHONE	WEBSITE
240 West Emerling Avenue Akron, OH 44301 United States	1-888-889-9150	www.emeraldmaterials.com

NO. OF EMPLOYEES
750

Executives

NAME/TITLE
Candace M Wagner President/CFO
Becki L Watson VP/Controller
Julie O Vaughn VP:Business Dev & Mktg Svcs

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Jun 04, 2014, 04:15 ET

NEW YORK, June 4, 2014 /PRNewswire/ -- American Securities LLC, a leading U.S. private equity firm, announced that it has partnered with management and signed a definitive agreement to acquire Emerald Performance Materials, LLC from an affiliate of Sun Capital Partners, Inc. The transaction is expected to close in the third quarter of 2014 and is subject to customary closing conditions and regulatory approvals. Financial terms of the transaction were not disclosed.

Based in Cuyahoga Falls, Ohio, Emerald is a leading producer and marketer of specialty chemicals for niche consumer and industrial end-markets, which include flavors & fragrances, food & beverage, personal and household care, composites, structural adhesives, coatings, and flooring. The Company's products enable end users to make goods that perform better through a variety of applications, such as adding color to paint and cosmetics, adding longevity to tires, imparting strength to adhesives and composites, providing scents to perfumes and soaps and preserving soft drinks. Emerald has eight operations and approximately 750 employees.

Candace M. Wagner, President and Chief Financial Officer of Emerald, said, "Over the past several years, we have continued to build a diverse family of market-leading brands, a blue chip customer base and a consistent record of annual revenue growth. We are excited to partner with American Securities as we look to innovate and produce the highest quality products available in the markets we serve, strengthen our operating focus and explore other initiatives to further expand our businesses."

Weil, Gotshal & Manges LLP served as legal counsel to American Securities, and Kirkland & Ellis LLP served as legal counsel to Emerald with respect to the transaction. Lazard and KeyBanc Capital Markets acted as financial advisors to Emerald with respect to the transaction.

About Emerald Performance Materials

Emerald Performance Materials produces and markets technologically advanced specialty chemicals for a broad range of food and industrial applications. Emerald® products play a variety of roles in the products that are consumed and used every day, enabling them to last longer, look, smell, taste or perform better. Emerald products are used in aerospace, food, beverages, cosmetics, toothpaste, household products, paint, tires, automobiles, sports gear and many other applications. Headquartered in Cuyahoga Falls, Ohio, Emerald has four business groups, eight operations and approximately 750 employees. For more information, the company's website is www.emeraldmaterials.com.

About American Securities LLC

Based in New York with an office in Shanghai, American Securities is a leading U.S. private equity firm that invests in market-leading North American companies with annual revenues generally ranging from $500 million to $2 billion. American Securities and its affiliates have approximately $10 billion under management. American Securities is currently investing from its sixth fund. The firm traces its roots to a family office founded in 1947 to invest and manage a share of the fortune created from the growth of Sears, Roebuck & Co in the early 1900s. More information about American Securities can be found at www.american-securities.com.

SOURCE American Securities LLC

WIKIPEDIA

American Securities

American Securities LLC—originally named *American Securities Capital Partners (ASCP)* 1994 - 2008—is a leading U.S. private equity firm—based in New York with an office in Shanghai—that invests in market-leading North American companies with annual revenues generally ranging from $200 million to $2 billion and/or $50 million to $250 million of EBITDA. American Securities and its affiliates have approximately $23 billion under management.[1] American Securities traces its roots to a family office founded in 1947 by William Rosenwald, the son of Julius Rosenwald (August 12, 1862 – January 6, 1932).

American Securities LLC

AMERICAN SECURITIES

Type	Private Ownership
Industry	Private Equity
Founded	1994
Founder	Michael G. Fisch
Headquarters	299 Park Avenue New York City, New York, United States, USA
Products	Private equity funds, Leveraged buyouts
AUM	$23 billion
Website	www.american-securities.com (http://www.american-securities.com/)

Contents

History

In 1994, American Securities (fka American Securities Capital Partners) formalized its private equity investment activities and opened them to outside investors. On June 8, 2009, American Securities Capital Partners officially changed its name to American Securities LLC.[2] As of May 2018, American Securities and its affiliates had approximately $23 billion under management. American Securities has invested in 60 companies across a variety of industries. As of May 2018, American Securities is currently partnered with 19 companies that have 50,900 collective employees worldwide.[1]

Affiliates

- Ascribe Capital (https://www.ascribecapital.com/) is an affiliate of American Securities LLC that manages approximately $2 billion of long-term capital focused on investing in the debt, and sometimes equity, securities of middle-market companies.[3]

Current Investments

Investments as of 2018:[4]

- Air Methods
- Aspen Dental
- Blount International
- Blue Bird
- Chromaflo Technologies
- Emerald Performance Materials
- Fairmount Santrol
- FleetPride
- Frontier Spinning Mills

- Global Tel*Link (GTL)
- Henry Company
- Learning Care Group
- Milk Specialities Global
- Mortgage Contracting Services
- MW Industries
- North American Partners in Anesthesia
- Prince
- Ulterra Drilling Technologies
- Unifrax Corporation

Previous Investments

Previous investments as of 2018.[5]

- Anthony International
- Arizona Chemical
- Cambridge International
- Caribbean Restaurants
- Community Pacific Broadcasting
- CTB International
- Delphi Midstream Partners
- Dr. Leonard's Healthcare
- El Pollo Loco
- FiberMark
- General Chemical Corp.
- GT Technologies
- Healthy Directions
- Ketema, Inc.
- Lakeside Energy
- Liberty Tire Recycling
- MECS
- Metaldyne Performance Group
- Miltex Instrument Company
- MVE
- NEP Broadcasting
- Oreck Corporation
- PDM Bridge
- Potbelly Sandwich Works
- Presidio
- Press Ganey
- Primary Energy Ventures
- Robertson Fuel Systems
- Royal Adhesives and Sealants
- SeaStar Solutions
- SpecialtyCare
- Tekni-Plex
- TNP Enterprises
- Unifrax Corporation
- Unison Site Management
- United Distribution Group
- VUTEk
- Weasler Engineering
- Westward

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5. https://www.american-securities.com/en/companies#?status= (https://www.american-securities.com/en/companies#?status=Current) past

External links

- American Securities LLC (http://www.american-securities.com) (company website)

AMERICAN SECURITIES

Scott Wolff

Managing Director

Scott Wolff joined American Securities in 2002. He is currently Chairman of the Board of Chromaflo Technologies, Emerald Performance Materials, Henry Company, and Prince.

Prior to joining American Securities, Scott worked in the Mergers & Acquisitions Group at Merrill Lynch, focusing on a variety of industries, including consumer products, food, packaging and automotive.

He received a BS in Finance from Indiana University's Kelley School of Business and an MBA from the University of Pennsylvania's Wharton School.

Contact

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swolff@american-securities.com

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Chromaflo Technologies

Emerald Performance Materials

General Chemical

GT Technologies

Henry

MECS

Primary Energy

Prince Source to Solution

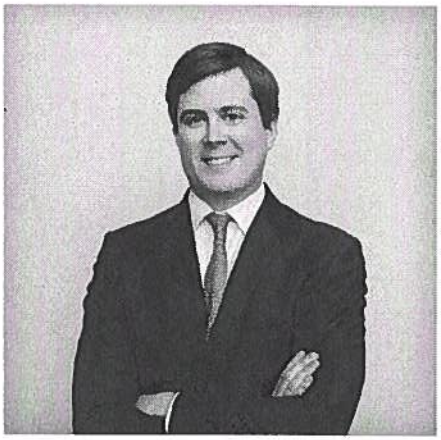
Royal Adhesives & Sealants

Seastar Solutions

AMERICAN SECURITIES

Ben Dickson

Managing Director



Ben Dickson joined American Securities in 2011. He is currently Chairman of the Board of NAPA, as well as a Director of Air Methods, Aspen Dental, and Emerald Performance Materials.

Prior to joining American Securities, Ben worked at Active Interest Media as its director of corporate development and was responsible for designing and leading the company's growth strategy. He has also worked as an investment professional with the private equity firms GTCR Golder Rauner and Wind Point Partners, and as a management consultant with McKinsey & Company. While in business school, Ben founded, built, and sold a technology company that assisted publishers with building their internet traffic.

Ben received a BS in Accounting and Finance from Indiana University's Kelley School of Business and an MBA from Northwestern University's Kellogg School of Management.

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NAPA North American Partners in Anesthesia · PRESIDIO · ROBERTSON FUEL SYSTEMS · SEASTAR SOLUTIONS

AMERICAN SECURITIES

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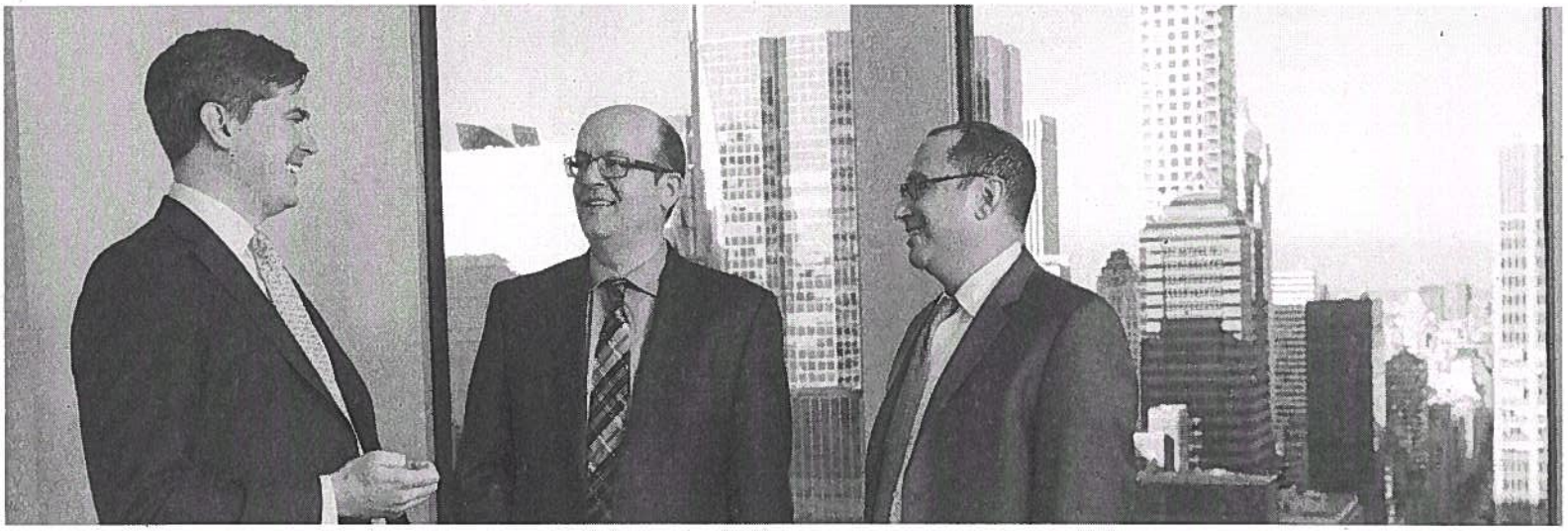
Our investment philosophy is focused on partnership with great companies and their existing management teams, using conservative capital structures to enable stability, growth, and flexibility.



▲ Ben Dickson, SeaStar CEO Yvan Cote, and Scott Wolff

25
YEARS

In Private Equity

23
BILLION

Committed Capital

63
TOTAL

Investments

Our Portfolio of Companies

We partner with companies with leading or highly-defensible market positions led by proven management teams.

18

CURRENT

Investments

14

BILLION

Revenue

2.2

BILLION

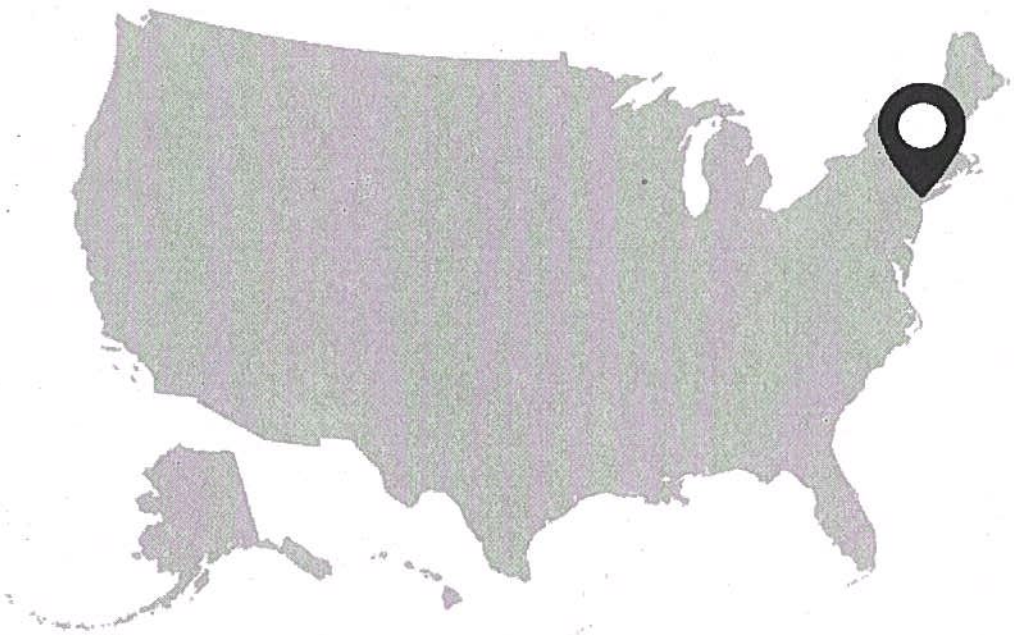
EBITDA

44
Countries

63,200
Employees

▲ Kevin Penn, Helen Chiang, and Former Learning Care Group CEO Barbara Beck

Our Offices



113

Colleagues in the U.S.

13

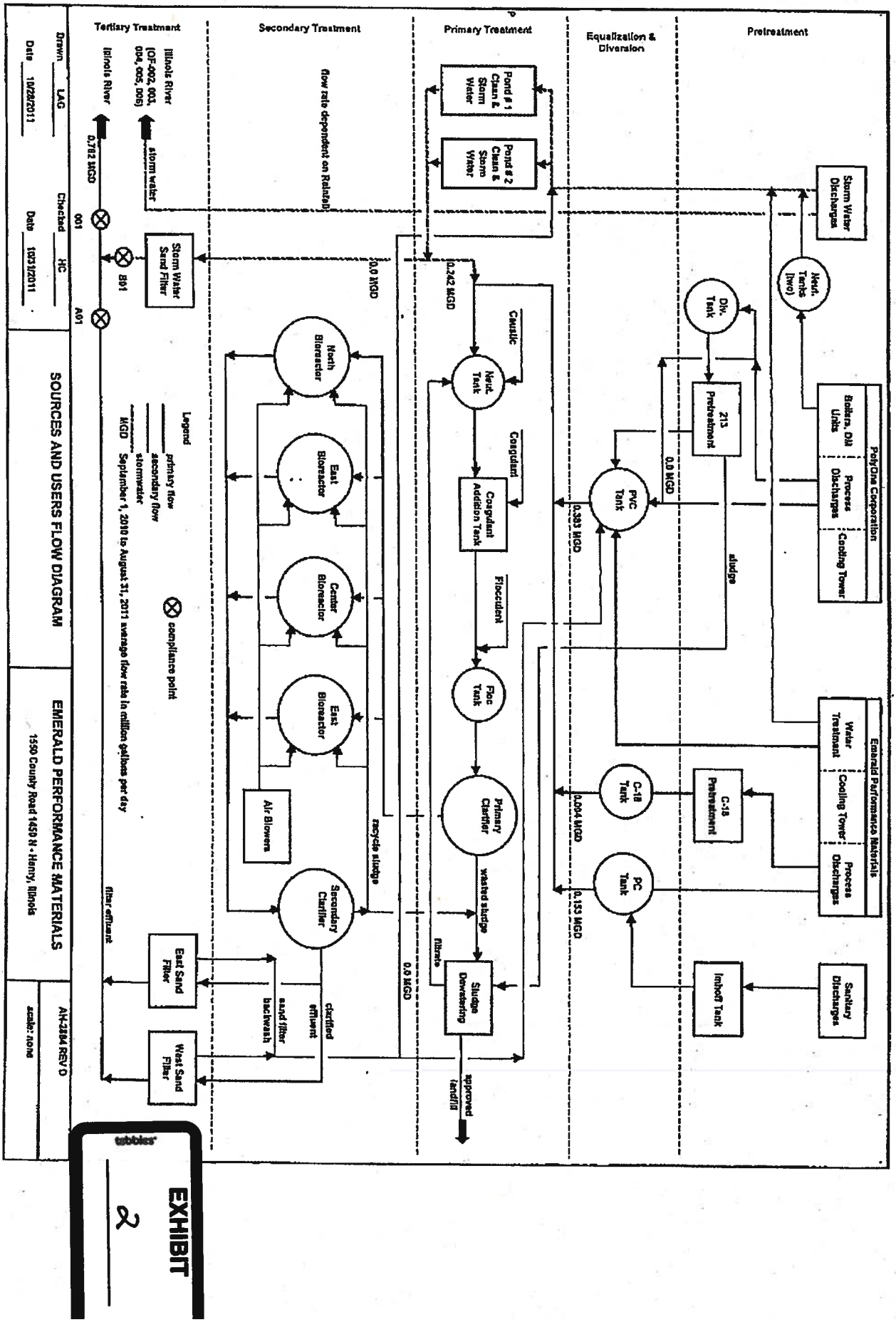
Colleagues in China

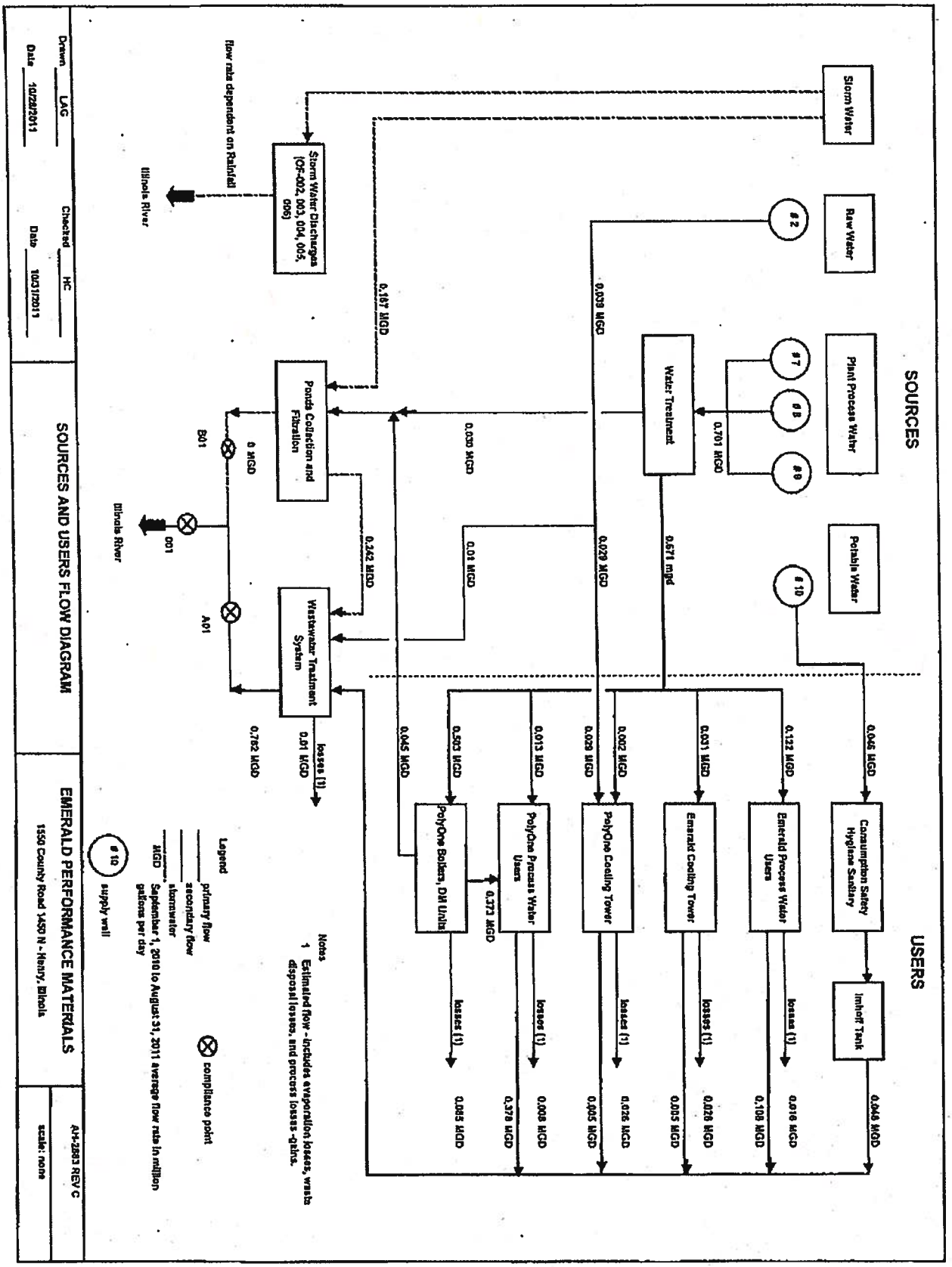
Our Affiliates

Ascribe Capital is a private investment firm managing approximately $3 billion of long-term capital focused on investing in the debt, and sometimes equity, securities of middle-market companies.

ascribecapital

We partner with management teams to drive long-term value. Meet our team.


Pretreatment
Equalization & Diversion
Primary Treatment
Secondary Treatment
Tertiary Treatment
Storm Water Discharges
Neut. Tanks (two)
Div. Tank
213 Pretreatment
PolyOne Corporation
Boilers, DM Units
Process Discharges
Cooling Tower
Emerald Performance Materials
Water Treatment
Cooling Tower
Process Discharges
Sanitary Discharges
Inhoff Tank
C-18 Pretreatment
C-18 Tank
PC Tank
PVC Tank
sludge
0.0 MGD
0.393 MGD
0.004 MGD
0.153 MGD
Pond # 1 Clean & Storm Water
Pond # 2 Clean & Storm Water
flow rate dependent on Rainfall
0.242 MGD
Caustic
Neut. Tank
Coagulant
Coagulant Addition Tank
Flocculent
Floc Tank
Primary Clarifier
wasted sludge
Sludge Dewatering
filtrate
0.0 MGD
approved landfill
recycle sludge
North Bioreactor
East Bioreactor
Center Bioreactor
East Bioreactor
Air Blowers
Secondary Clarifier
clarified effluent
sand filter backwash
East Sand Filter
West Sand Filter
filter effluent
Storm Water Sand Filter
B01
storm water
Illinois River (OF-002, 003, 004, 005, 006)
Illinois River
0.782 MGD
001
A01
Legend
primary flow
secondary flow
stormwater
compliance point
MGD September 1, 2010 to August 31, 2011 average flow rate in million gallons per day
Drawn LAG
Date 10/28/2011
Checked HC
Date 10/31/2011
SOURCES AND USERS FLOW DIAGRAM
EMERALD PERFORMANCE MATERIALS
1550 County Road 1450 N • Henry, Illinois
AN-2884 REV 0
scale: none
tabbies
EXHIBIT
2


SOURCES
USERS
Storm Water
Raw Water
Plant Process Water
Potable Water
#2
#7
#8
#9
#10
Water Treatment
0.701 MGD
0.039 MGD
0.671 mgd
0.029 MGD
0.167 MGD
Storm Water Discharges (OF-002, 003, 004, 005, 006)
Flow rate dependent on Rainfall
Illinois River
Ponds Collection and Filtration
0.030 MGD
0.01 MGD
0.242 MGD
B01
0 MGD
001
A01
Illinois River
Wastewater Treatment System
0.762 MGD
losses (1)
0.61 MGD
0.045 MGD
0.503 MGD
0.013 MGD
0.029 MGD
0.002 MGD
0.031 MGD
0.122 MGD
0.046 MGD
PolyOne Boilers, DM Units
PolyOne Process Water Users
PolyOne Cooling Tower
Emerald Cooling Tower
Emerald Process Water Users
Consumption Safety Hygiene Sanitary
Imhoff Tank
losses (1)
0.372 MGD
0.378 MGD
0.005 MGD
0.085 MGD
0.008 MGD
0.026 MGD
0.028 MGD
0.016 MGD
0.049 MGD
0.108 MGD
Notes
1 Estimated flow - includes evaporation losses, waste disposal losses, and process losses -qhhs.
Legend
primary flow
secondary flow
stormwater
compliance point
MGD Septeember 1, 2010 to August 31, 2011 average flow rate in million gallons per day
#10 supply well
Drawn LAG
Date 10/28/2011
Checked HC
Date 10/31/2011
SOURCES AND USERS FLOW DIAGRAM
EMERALD PERFORMANCE MATERIALS
1550 County Road 1450 N - Henry, Illinois
AN-2583 REV C
scale: none

33A

Emerald Performance Materials®
Kalama Chemical

W1230050002-3

April 17, 2018

CERTIFIED MAIL: 7016 1370 0002 2632 1241

Division of Water Pollution Control
Compliance Assurance Section – Mail Code 19
Illinois Environmental Protection Agency
P. O. Box 19726
Springfield IL 62794-9276

IEPA-DIVISION OF RECORDS MANAGEMENT
RELEASABLE

SEP 04 2018

REVIEWER: MJK

Re: Adjusted Standard 13-2 (NPDES Permit No. IL0001392) – Update Report

To Whom It May Concern:

The Henry, IL Emerald Performance Materials facility is submitting the following report to show continued compliance with the all of requirements of Adjusted Standard 13-2, which are incorporated into NPDES Permit No. IL0001392 Special Condition 16. AS13-2 Conditions 2(c) and (d) require the plant to generally investigate new production methods and technologies that would generate less nitrification inhibitors (i.e., MBT) and new treatment technologies. AS13-2 Condition 2(e) specifically requires the plant to investigate and submit reports evaluating three alternative treatment ideas: granulated activated carbon (GAC), spray irrigation, and river water dilution.

RECEIVED

MAY 31 2018

IEPA/Cas

Report as to Conditions 2(c) and (d):

The Henry facility has put together a continuous process improvement project to identify and evaluate potential modifications of the processes and product recipes 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 WWTF effluent have been unsuccessful since the issuance of AS13-2.

Report as to Condition 2(e):

Granulated Activated Carbon (GAC). The pretreatment of plant wastewater using GAC to remove mercaptobenzothiazole (MBT) was evaluated at a bench scale by Brown & Caldwell.

EXHIBIT
3

In the bench scale testing, B&C found that GAC would sufficiently reduce MBT concentrations to allow the microorganisms in the plant wastewater treatment system to achieve adequate nitrification. B&C also evaluated the cost of this alternative and found that its estimated cost is 20x higher than the costs incurred by municipal wastewater treatment facilities in Illinois and 11x higher than the average cost of municipal facilities nationwide. The B&C report is Attachment A. Based on these findings, Emerald does not believe GAC is economically reasonable.

Spray Irrigation/Land Application. Emerald investigated the technical feasibility of a spray irrigation (land application) program. A spray irrigation program is not a technically feasible option for the Henry facility's treated wastewater. There are two principal flaws with this option: a lack of symbiosis between wastewater treatment operations and the agricultural needs for nitrogen amendments; and regulatory restrictions. The regulatory restrictions are paramount.

Condition 2(e) of AS13-2 asks for an evaluation of spray irrigation in accordance with 35 IAC Part 372. Those regulations establish design standards and other standards for low-rate land application of secondary and tertiary treated **domestic** wastewater. Emerald's discharge is industrial wastewater and the Part 372 regulations do not allow low-rate land application of the Henry plant treated effluent. Further, presently the discharge from the plant's wastewater treatment system is not subject to regulation as solid or hazardous waste because of the RCRA exemption for wastewater discharges subject to a NPDES permit under 35 IAC 721.104(a)(2) and its federal equivalent 40 CFR 261.4(a)(2). If a portion of the wastewater stream was diverted to spray irrigation, the diverted portion might be considered land disposal of a solid waste, or possibly a hazardous waste. USEPA considered an analogous circumstance at a landfill in Kentucky in 2007 that wanted to discharge treated leachate that was high in ammonia via spray irrigation. USEPA determined that the proposal – even if it was incorporated into the landfill's NPDES permit – would be prohibited land disposal of a hazardous waste. The USEPA determination is included as Attachment B.

Even if the regulations that restrict the land application of the wastewater were revised; spray irrigation would still not be a technically feasible option because there is a lack of symbiosis between wastewater treatment operations and agricultural needs. The Henry facility continuously discharges treated effluent to the Illinois River. The mass of ammonia discharged is not constant, but rather fluctuates with production. This would require frequent analysis and adjustment of the land application rate in order to meet the nitrogen requirements of the crops. And since the nitrogen is present as dissolved ammonia, the only way to get the nutrient to the crops is via irrigation. Crop irrigation and nitrogen needs do not occur continuously during the growing season and cease altogether outside the growing season.

Land application of biosolids and other soil amendments must follow 40 CFR 503 Subpart B regulations. One of the requirements is that soil amendments must only be applied during the active growing season. In this region of Illinois, the growing season is between 175 and 180

days (at most) in duration. The wastewater effluent would have to be discharged to the Illinois River during the other 185 to 190 days when land application is restricted. Emerald owns 80 acres of land, currently leased to a local farmer, onto which the effluent could be land applied. If the 80 acres were planted with corn, which has a fairly high nitrogen demand of 110 pounds of nitrogen per acre per growing season; 8,800 pounds of nitrogen would be required (assuming 100 bushels per acre). This quantity of nitrogen could be supplied by the wastewater effluent in less than 20 days. Thus, even during the growing season, the available cropland could only receive a small portion of the Henry plant's wastewater. For this additional reason, the spray irrigation option is not technically feasible.

River Water Dilution. 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. See Attachment A. 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 40x higher than the costs incurred by municipal wastewater treatment facilities in Illinois and 21x higher than the average cost of municipal facilities nationwide. Based on the B&C report and Emerald's own evaluation, the river water dilution alternative is not technically feasible or economically reasonable. There are three reasons why this option must be rejected: the option is not likely to achieve the desired ammonia removal; the ancillary environmental impacts outweigh the benefits of any reduction in the mass of ammonia discharged; and the economic cost is prohibitive as demonstrated by B&C.

For the reasons described in the B&C report, Emerald seriously doubts that the river water dilution option can consistently achieve the ammonia reductions that were achieved in the bench scale testing. Also, diluting the facility'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.

This alternative would also have significant negative cross-media environmental impacts. Temperature is a critical parameter for the microorganisms that digest the organic chemicals in the wastewater. Steam is injected into the wastewater in order to ensure the temperature is maintained within the optimum range at all times of the year. Since the Illinois River temperature is much colder than the optimal treatment system temperature in late fall, winter and early spring, additional steam would have to be injected to maintain the required temperature range. The volume of river water needed to achieve nitrification on a bench scale is nearly ten times the volume of wastewater the facility typically generates and would

require the installation of a 140 million Btu per hour boiler to provide the additional steam. Assuming the boiler ran for seven months of the year, was natural gas-fired, equipped with low-NO_x burners and flue gas recirculation, it could emit as much as 38,000 metric tons of CO_2e greenhouse gases, 35 tons of nitrogen oxides, and 30 tons of carbon monoxide per year 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 concentration in the effluent.

If you have any questions, please contact David Sikes, HS&E Manager via email at david.sikes@emeraldmaterials.com or call at 309.364.9472.

Respectfully,

Galen Hathcock
Plant Manager

algaewheel®

An Algae Based Treatment System Provides A Truly Sustainable Treatment Solution For Small & Seasonal Wastewater Treatment Plants

ONEwater
Treatment redefined

EXHIBIT
tabbies
4

Agenda

ONEWATER Treatment redefined

- ***Small and Seasonal Plant Issues***
- ***Algae and Bacteria in Symbiosis***
- ***Cincinnati Nature Center Case Study***
- ***Indiana Dunes Case Study***
- ***Summit Lake State Park Case Study***

Small/Seasonal Treatment Challenges

ONEWater
Treatment redefined

The design and operation of a small and seasonal wastewater treatment facility is a tough challenge faced by engineers, owners and operators

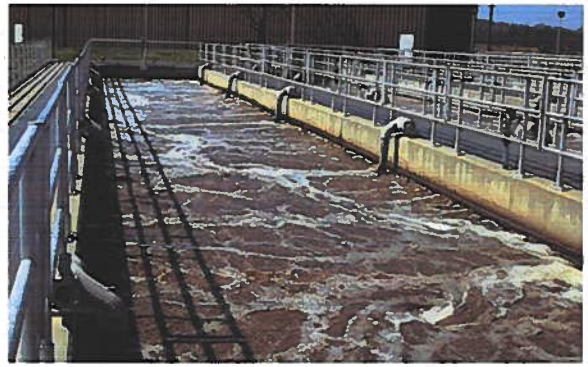
- **Owners often install these type of facilities because there is no other choice**
- **Tens of thousands of these small-scale facilities service a wide range of applications**
- **Many small/decentralized systems;**

Treatment Technology Available for Small Plants

ONEWATER
Treatment redefined

Many small/decentralized facilities are in need of urgent upgrade and must now meet tightening permit limits and reduce operating costs

- **Viable options for retrofit have been limited to familiar solutions**
- **Algaewheel is a revolutionary technology that looked to nature for inspiration, and the result is technology that uses daylight to power a superior treatment biology.**

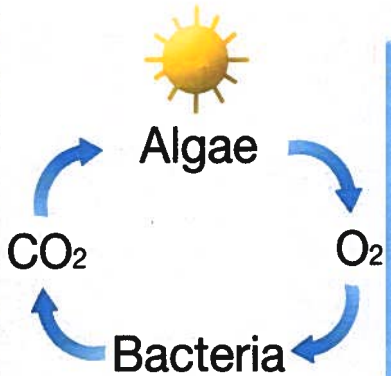


Algaewheel Biological Process

ONEwater Treatment redefined

Algal biofilms provide superior ecology that delivers enhanced fixed film treatment

- **Algaewheel uses photosynthesis to cultivate a diverse ecological environment**
- **Strong symbiosis between algae & bacteria makes the system very efficient and resistant to fluctuation**



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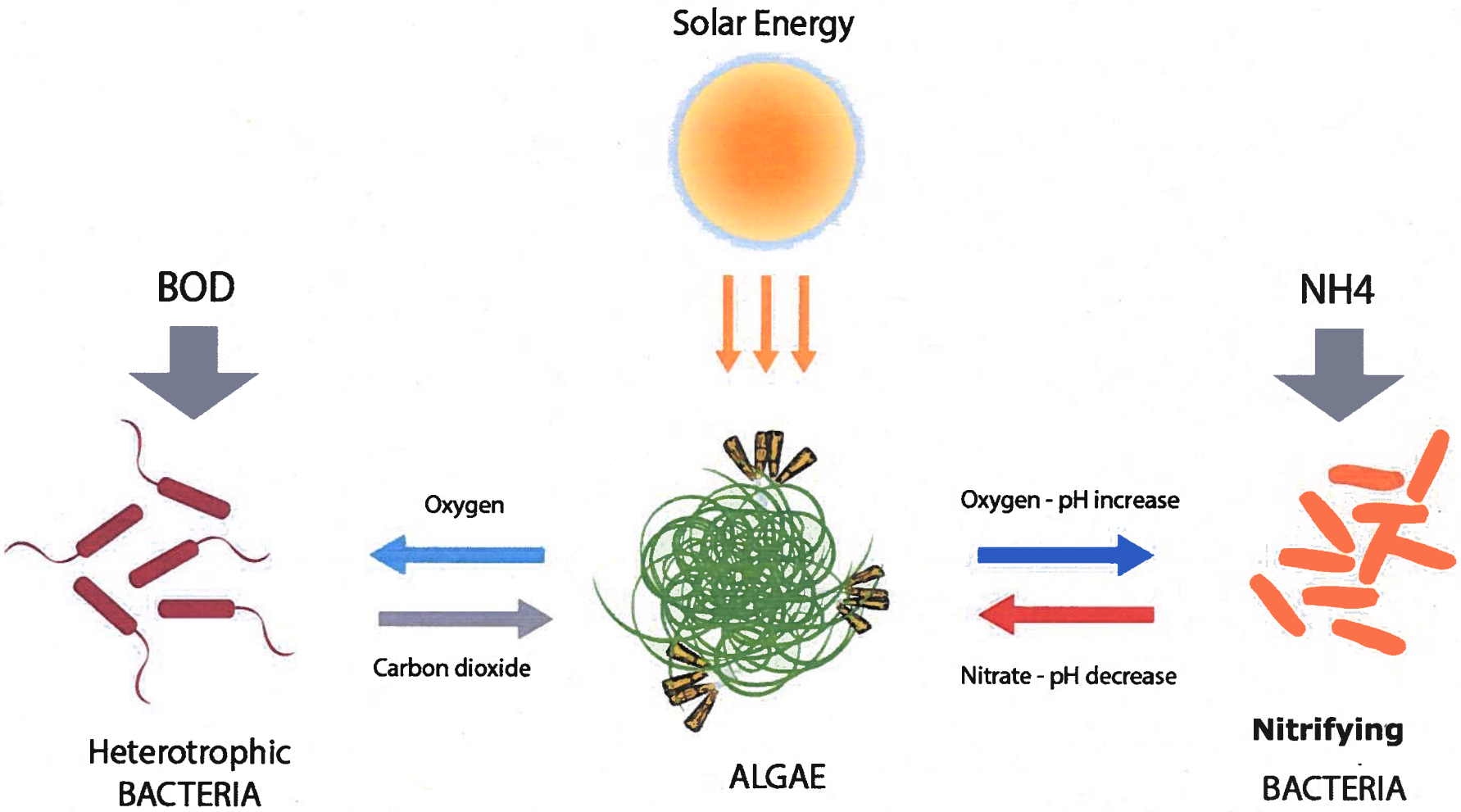
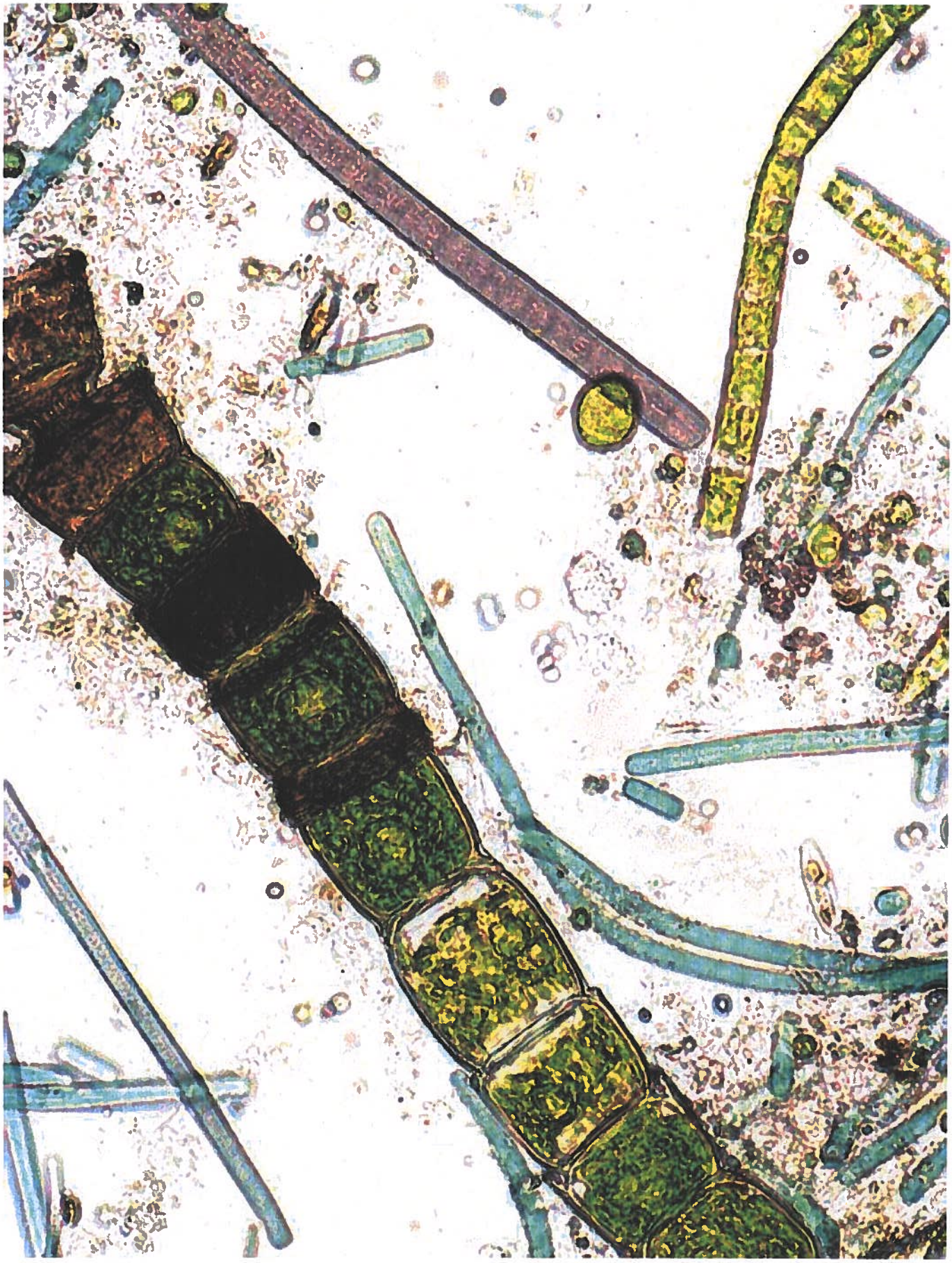
algaewheel®



ONEWATER
Treatment redefined



Cincinnati Nature Center - 2010

Cincinnati Nature Center is a non- profit Nature Education organization whose Mission is to inspire passion for Nature and promote environmentally responsible choices through involvement, education and conservancy.

- **In 2010 the planned expansion of the Center was slowed:**

  a) two existing forty year old subsurface wastewater treatment plants were noisy, smelled and were expensive to operate

  b) connecting the Center to County's sewer system would cost $ 1million

  c) a proposed Constructed Wetland was rejected due to both cost and the large area it would require

- **The Solution - construct an Algaewheel Treatment plant in 2011 to meet EPA's stringent new requirements of BOD – 10 mg/l, SS – 12 mg/l, NH4 – 1 mg/l summer**
  - 3 mg/l winter

Cincinnati Nature Center - 2011

ONEcowater
Treatment redefined

One of the largest non-profit, nature education organizations in the country.
Open year round, center required environmentally friendly treatment solution

- **The center has a restaurant, bathrooms and shower facilities**
  - waste streams have very high levels of ammonia
- **Plant designed for 20-25 mg/L ammonia**
- **Actual ammonia averaged 52.9 with peaks of >120mg/l**
- **Flows from 0 to 4 times peaking**
- **System has reliably met all NPDES requirements (10/12/1)**
  - now in its 4th year of successful operation
  - discharges to local stream

algaewheel

Performance Analysis – Cincinnati Nature Center

ONEwater Treatment redefined

Ammonia

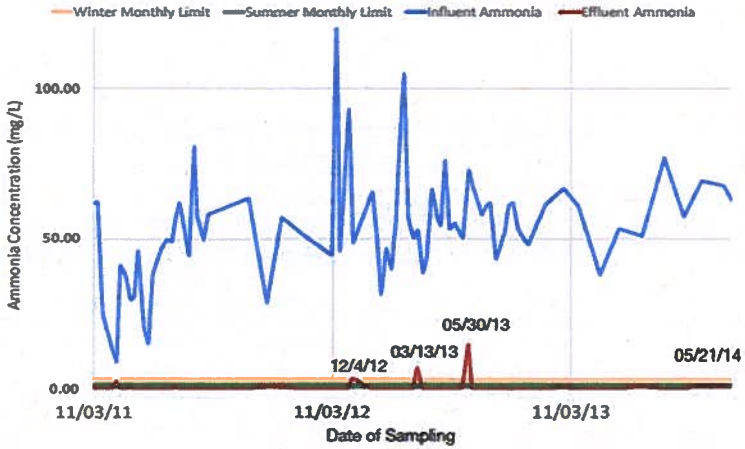
Effluent Ammonia concentrations were below weekly & monthly permit limits of 4.5 and 3 mg/l during winter and 1.5 mg/l and 1 mg/l during the summer respectively for the study period

Avg. influent 52.9 mg/L (max 120 mg/l)*

Avg. effluent 0.2 mg/L (max 2.3 mg/l)**

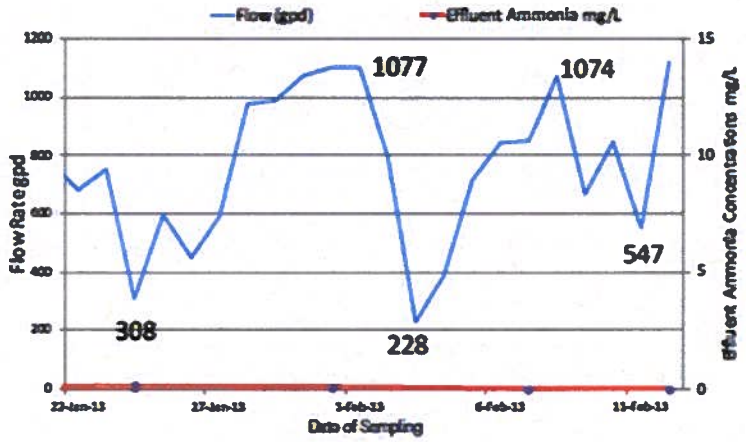
* System designed for average ammonia of 25 - 30mg/l

** Peaks were observed on 3 occasions caused by operational related issues



Low Flows

Even through periods of low flow, the system continued to consistently meet permit limits



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Performance Analysis – Cincinnati Nature Center

ONEWater Treatment redefined

The case study summarizes 3 years of data collected up to October 2014 demonstrating the ability of Algaewheel to reliably comply with permit limits

CBOD

Effluent CBOD5 concentrations were below weekly & monthly permit limits of 15 and 10 mg/l respectively for study period

Avg. influent 123 mg/L (max 371 mg/l)

Avg. effluent 2.3 mg/L (max 7 mg/l)

TSS

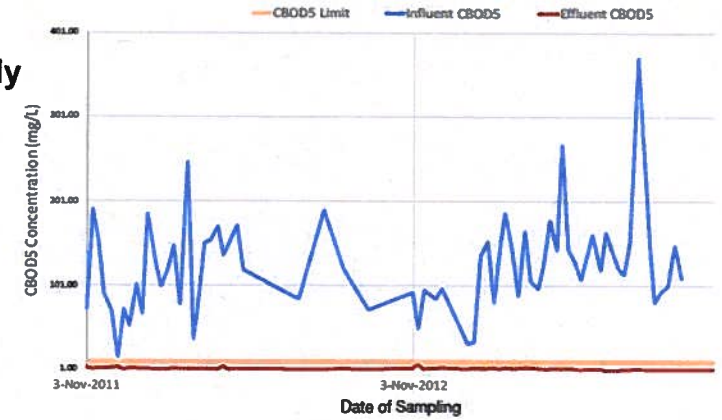
Effluent TSS concentrations were below weekly & monthly permit limits of 12 and 18 mg/l respectively for study period

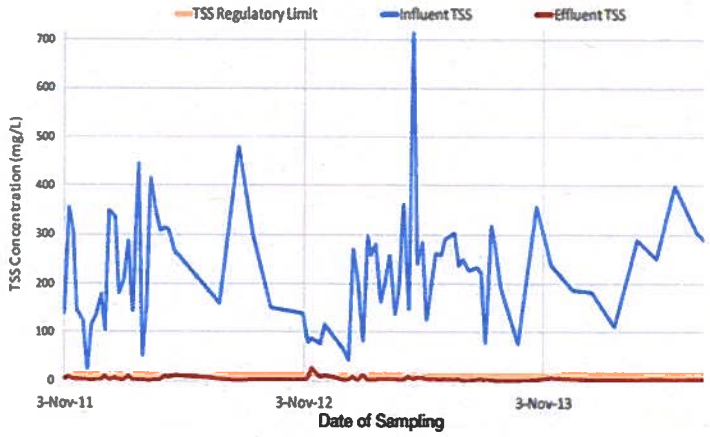
Avg. influent 227 mg/L (max 716 mg/l)

Avg. effluent 4.3 mg/L (max 11.6 mg/l)

Parameter	Weekly Limit	Monthly Limit
CBOD5	15	10
TSS	18	12
Ammonia: Winter	4.5	3
Ammonia: Summer	1.5	1
Total Phosphorous	N/A	N/A
Total Nitrogen	N/A	N/A

Table 1. NPDES permit limits for Cincinnati Nature Center





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Indiana Dunes State Park (DNR) - 2010

ONEWater Treatment redefined

- Indiana Dunes State Park's aging steel package plant needed to be replaced.
- Indiana Department of Natural Resources hired Commonwealth Engineers to design a new concrete activated sludge plant with discharge to an adsorption field.
- The DNR and the engineer accepted the successful contractor's alternate to install an Algaewheel Treatment system due to simplicity of operation and operational cost savings.
- In 2011 – The Indiana Dunes State Park installed an Algaewheel Treatment system

algaewheel

Indiana Dunes State Park (DNR) - 2011

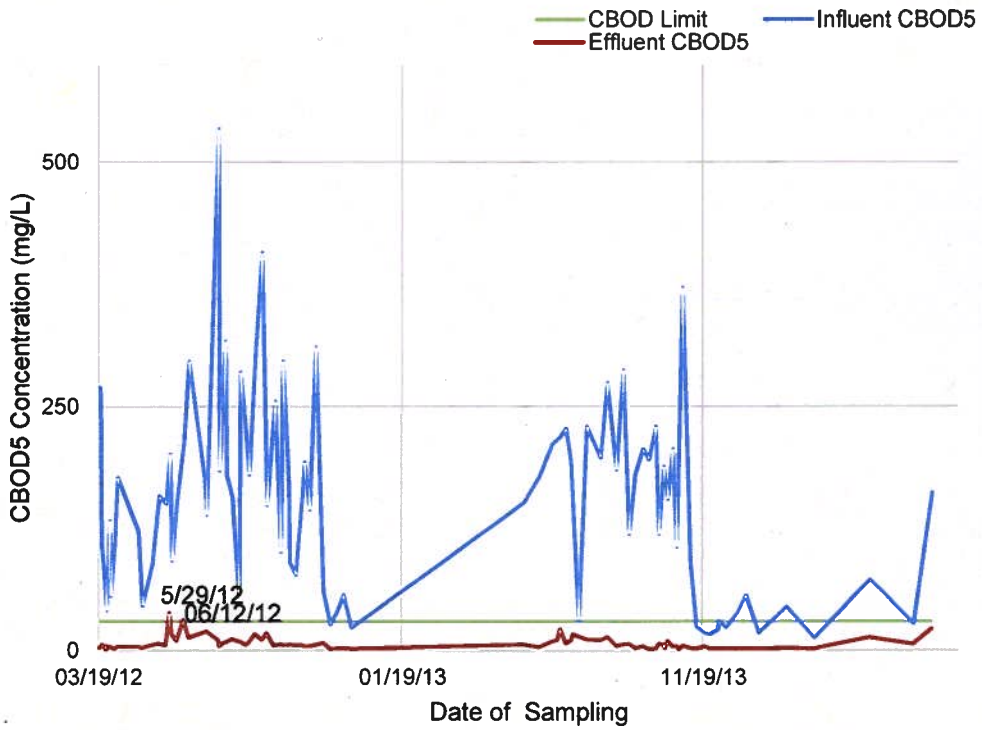
ONEwater Treatment redefined

One of the top 5 environmentally sensitive and protected state parks in the U.S. due to its unique characteristics on the shore of Lake Michigan

- **The park has an R.V. park, camping and extensive bathroom and shower facilities**
- **Plant designed for 34,000 gpd**
- **July 2014 flow averaged 79,600 gpd with peaks 95,000 gpd**
- **System has reliably met all regulatory requirements**
  - now in its 4th year of successful operation
  - BOD 30, TSS 30
  - discharge to subsurface drip irrigation field

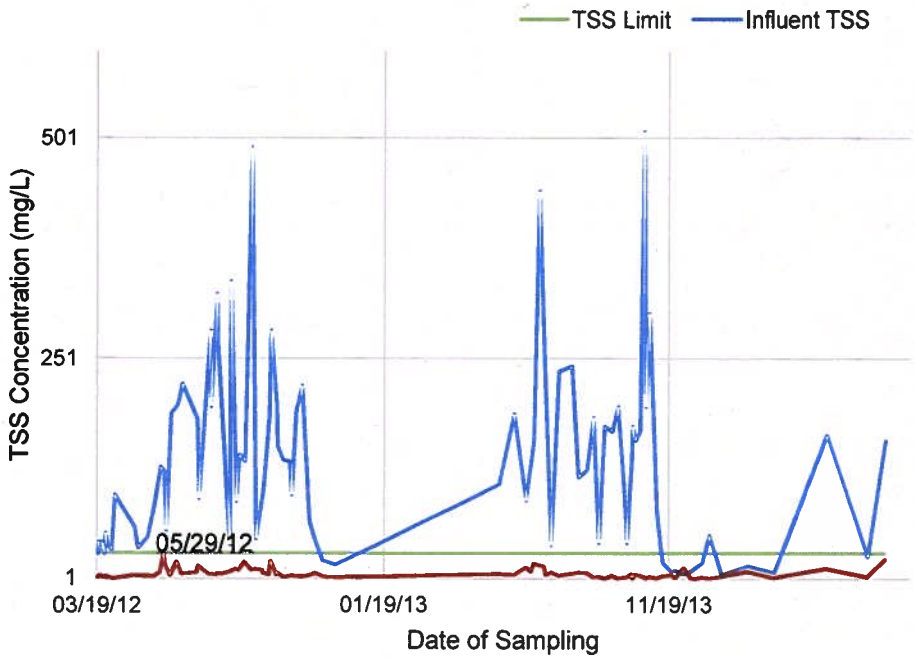
algaewheel

Performance Analysis – Indiana Dunes



Dunes ATP has consistently met CBOD and TSS limits

Performance Analysis – Indiana Dunes

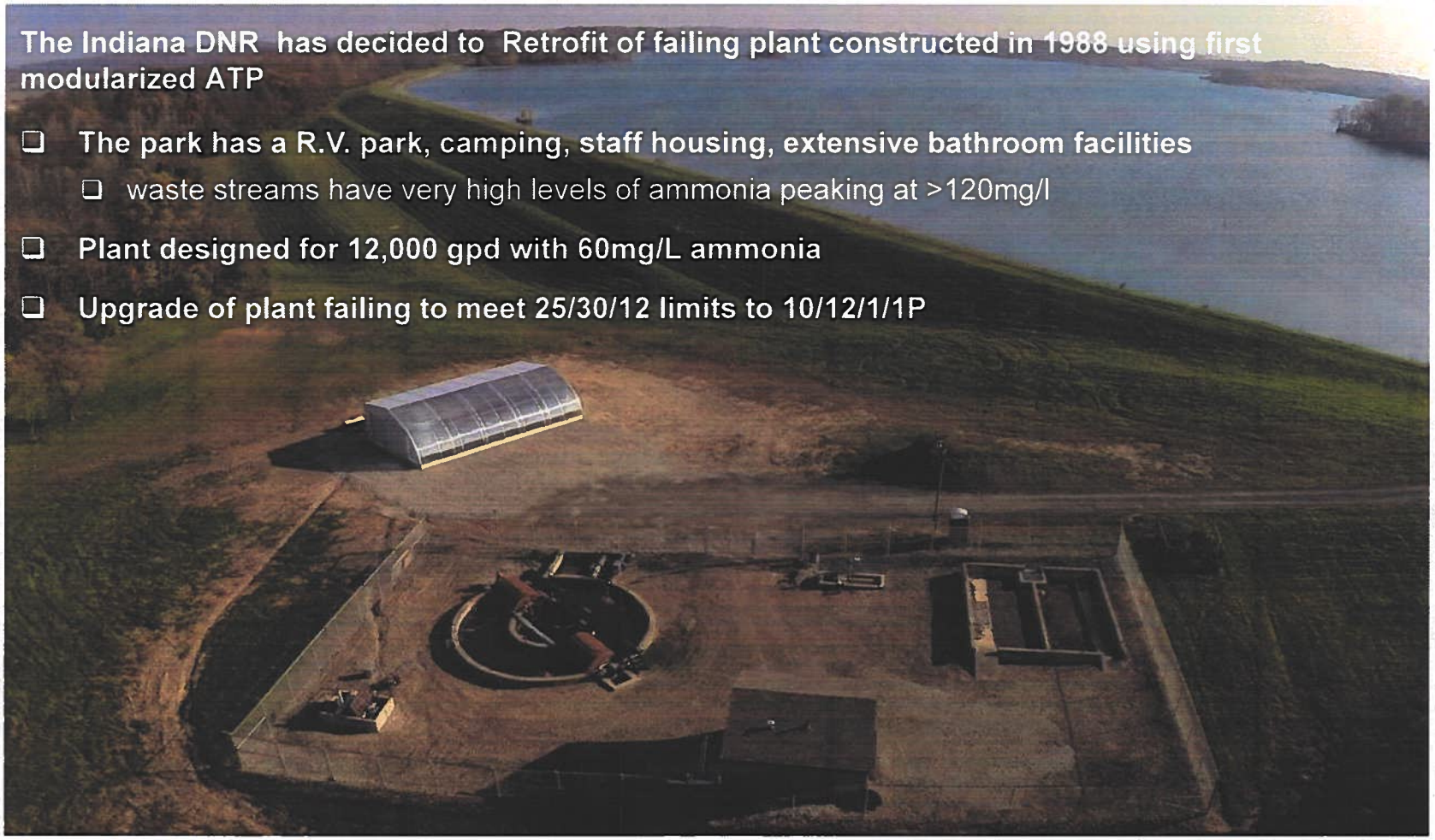


Dunes has consistently met TSS limits.

Summit Lake State Park, Indiana (DNR) - 2014

ONEWATER Treatment redefined

Based on the Success of the facilities at Cincinnati Nature Center and the Indiana Dunes –



algaewheel

Advanced Treatment Made Simple and Affordable

ONEWATER
Treatment redefined

algaewheel

ATP Wheel Basins at Summit Lake

ONEwater
Treatment redefined

algaewheel

Thank you!

algaewheel®

exclusively from

ONE water®
Treatment redefined

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	AS 19-002
Petition of Emerald Polymer Additives, LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)	)	(Adjusted Standard)

AFFIDAVIT OF MARK LISKA

I, MARK LISKA, being first duly sworn upon oath deposes and states as follows:

1. I am an environmental protection engineer within the Industrial Permits Section of the Bureau of Water at the Illinois Environmental Protection Agency.

2. In that position, I have personal knowledge of the facts set forth in the attached Recommendation of The Illinois Environmental Protection Agency to Deny Petitioner's Request for an Adjusted Standard.

3. I certify, under penalties as provided by law pursuant to Section 1-109 of the Illinois Code of Civil Procedure, that the statements set forth in the foregoing Recommendation of The Illinois Environmental Protection Agency to Deny Petitioner's Request for an Adjusted Standard are true and correct, except as to matters therein stated to be on information and belief, and as to such matters, I certify, as aforesaid, that I believe the same to be true.

Mark Liska
MARK LISKA

Dawn A. Hollis
Notary

OFFICIAL SEAL
DAWN A. HOLLIS
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 03-21-2021

EXHIBIT
5

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	AS 19-002
Petition of Emerald Polymer Additives, LLC for an Adjusted Standard from 35 Ill. Adm. Code 304.122(b)	)	(Adjusted Standard)

AFFIDAVIT OF SCOTT TWAIT

I, SCOTT TWAIT, being first duly sworn upon oath deposes and states as follows:

1. I am a manager of the Water Quality Standards Division, within the Water Pollution Control Section, of the Bureau of Water at the Illinois Environmental Protection Agency.

2. In that position, I have personal knowledge of the facts set forth in the attached Recommendation of The Illinois Environmental Protection Agency to Deny Petitioner's Request for an Adjusted Standard.

3. I certify, under penalties as provided by law pursuant to Section 1-109 of the Illinois Code of Civil Procedure, that the statements set forth in the foregoing Recommendation of The Illinois Environmental Protection Agency to Deny Petitioner's Request for an Adjusted Standard are true and correct, except as to matters therein stated to be on information and belief, and as to such matters, I certify, as aforesaid, that I believe the same to be true.

Scott Twait
SCOTT TWAIT

Dawn A. Hollis
Notary

OFFICIAL SEAL
DAWN A. HOLLIS
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 03-21-2021

CERTIFICATE OF SERVICE

I, the undersigned, on affirmation state the following:

That I have served the attached **RECOMMENDATION OF THE ILLINOIS ENVIRONEMNTAL PROTECTION AGENCY TO DENY PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD** by e-mail upon Thomas W. Dimond at the e-mail address of Thomas.Dimond@icemiller.com, upon Kelsey Weyhing at the e-mail address of Kelsey.Weyhing@icemiller.com, upon Don Brown at the e-mail address of don.brown@illinois.gov upon Carol Webb at the e-mail address of Carol.Webb@illinois.gov.

That I have served the attached **RECOMMENDATION OF THE ILLINOIS ENVIRONEMNTAL PROTECTION AGENCY TO DENY PETITIONER'S REQUEST FOR AN ADJUSTED STANDARD** upon any other persons, if any, listed on the Service List, by placing a true copy in an envelope duly address bearing proper first class postage in the United States mail at Springfield, Illinois on July 19, 2019.

That my e-mail address is Rex.Gradeless@Illinois.gov.

That the number of pages in the e-mail transmission is seventy-nine (79).

That the e-mail transmission took place before 4:30 p.m. on the date of July 19, 2019.

/s/Rex L. Gradeless
July 19, 2019