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August 12, 2019

Russell Kelly, Chief
Permits and Services Division
Alabama Department of Environmental Management
P. O. Box 301463
Montgomery, AL 36130-1463

Re: Tyson Foods Inc. – Blountsville Facility – NPDES Permit Number AL001449

Via electronic mail only to RAK@adem.alabama.gov

Dear Mr. Kelly,

Thank you for the opportunity to comment on the Alabama Department of Environmental Management (ADEM) Draft Permit (Permit) referenced above for Tyson Farms, Inc.'s Blountsville Processing Plant. If issued, the Permit will authorize discharges of polluted water resulting from treated poultry process, sanitary wastewater, and stormwater. Process wastewater will be discharged through DSN001 and stormwater through DSN002-DSN004 to Graves Creek, a tributary of the Locust Fork in the Black Warrior River basin. Graves Creek is an impaired stream with an established TMDL for Low Dissolved Oxygen/Organic Loading. The Locust Fork is an impaired stream with an established TMDL for Nutrients. The Permit authorizes an alternate location for the discharge of process, sanitary and stormwater through DSN005 to the Locust Fork, also classified as Fish and Wildlife in the Black Warrior River basin. Outfall 005 should be struck from the final permit, as noted in the comments below.

These comments are submitted on behalf of Black Warrior Riverkeeper and the Southern Environmental Law Center. Black Warrior Riverkeeper is a 501(c)(3) nonprofit membership organization with over 4,000 members that is dedicated to the protection and restoration of the Black Warrior River and its tributaries. Riverkeeper's members rely on the quality of the Black Warrior River for their livelihoods, and they regularly fish, swim, and boat in the river. The Southern Environmental Law Center is a non-profit, regional environmental organization dedicated to protecting natural resources, preserving special places, and promoting vibrant communities throughout the Southeast. We appreciate the opportunity to submit these comments.

At the outset, we note numerous information gaps in the permit application, the permit file and the Permit which we detail in our comments below. We ask ADEM to address these gaps, incorporate necessary information into the Permit, and re-issue a corrected draft permit for public comment.

Introduction

The June 6, 2019 wastewater spill at Tyson's River Valley Ingredients plant on the Mulberry Fork of the Black Warrior River offers a sobering example of a regulatory approach that is relevant to the development of the Permit. When Tyson took over River Valley Ingredients in 2018, the plant had a checkered compliance history made worse by lenient permit requirements and lack of regulatory oversight. That lack of oversight continued after Tyson bought the plant; ADEM's eFile system shows that prior to the spill this facility was in noncompliance in August 2018, November 2018, and May 2019, including a smaller wastewater spill.

Instead of driving the conversation about treatment requirements and permit requirements, ADEM has largely delegated the drafting of the Permit to Tyson. Tyson tells ADEM what compliance schedule it wants or what permit limits it can meet, then ADEM incorporates those deadlines and limits in the permit, citing the exercise of the Department's "best professional judgment" (BPJ). We ask ADEM to do more to protect the impaired receiving stream and downstream swimmers in developing the Permit.

In drafting the Permit, ADEM is supposed to calculate a technology based limit (TBEL) as well as a water-quality based limit (WQBEL) derived from the Locust Fork TMDL, then apply the stricter of the two. TBELs set effluent limitations for major point sources like the Blountsville plant based on how effectively technology can reduce the pollutants being discharged. *See* 33 U.S.C. §§ 1311(b), (e), 1314(b); *see also PUD No. 1 of Jefferson Cty. v. Wash. Dep't of Ecology,* 511 U.S. 700, 704, (1994) (holding that, to achieve goals of CWA, EPA is required to "establish and enforce technology-based limitations on individual discharges into the country's navigable waters from point sources").

Congress designed this standard to be technology-forcing, meaning it should force *agencies and permit applicants* to adopt technologies that achieve the greatest reductions in pollution. *See NRDC v. EPA*, 822 F.2d 104, 124 (D.C.Cir.1987) (holding that the CWA seeks "not only to stimulate but to press development of new, more efficient and effective technologies," which is "essential purpose of this series of progressively more demanding technology based standards"). ADEM has failed to look at the technology that Tyson is employing at other plants to reduce pollutant loadings to waterbodies in other states, or to consider how the employment of that technology in Alabama could reduce the pollution discharged to Graves Creek and the Locust Fork. Given that both of these waterbodies are impaired and the treatment is technologically feasible, why wouldn't ADEM evaluate these treatment capabilities to develop and impose TBELs?

We strongly urge ADEM to review our comments below and to use them to tighten permit requirements, based upon Tyson's impacts upon the environment (Exh. 2) and the technological treatment capabilities Tyson has exhibited in other states. As written, the numeric limits in the Permit are artificially high. We are not seeking lower limits as a part of some abstract permitting exercise; we are concerned about the levels of E. coli and fecal coliform bacteria, phosphorus, and nitrates that Tyson is discharging to impaired waterbodies used by the public. Tyson's discharge flows for less than 400 yards through a wetland before entering Graves Creek, approximately 1.6 miles upstream of its confluence with the Locust Fork. If Tyson is required to reduce its loading, those waterbodies are going to improve more rapidly and be restored to health for all to enjoy. What we ask for is very simple: downstream users should have confidence in the processes that Tyson employs, ADEM must properly

oversee those processes, and the public must receive timely notification of any exceedances where the exceedances affect the public interest.

This permit is an important opportunity for ADEM to stem some of the fierce criticism the Department has received post-spill at the Tyson River Valley facility. If the Department writes a protective permit, the process and outcome can begin to restore public confidence in ADEM. And if the Department fails to take advantage of this opportunity, we hope Tyson will voluntarily seek a better permit as a means of acknowledging its debt to Alabama water resources. These water resources play an important role in Tyson's business and success. These water resources are equally important to the local economy and local communities. One important way Tyson can reclaim goodwill in the wake of the Mulberry Fork wastewater spill is to significantly invest in their Alabama plants to implement state-of-the-art treatment technologies, showing that they care as much about these waters as the locals who have used them for generations. ADEM can and should incentivize technology and treatment upgrades at Tyson's plants by requiring more stringent permit limitations for pollutants such as nitrates in process wastewater and bacteria in stormwater.

Comments

1. The Draft Permit allows the discharge of poultry processing wastewater to Graves Creek, an impaired waterbody that is used by the public historically and currently for swimming and whole-body contact recreation. Mardis Mill Falls, located on Graves Creek just over a quarter mile downstream from Outfall DSN001, is heavily used by the public for contact recreation. Graves Creek flows to the Locust Fork within two miles of the discharge at DSN001. As discussed elsewhere, the Locust Fork is also an important natural resource and an impaired waterbody that is regularly used for swimming, fishing, tubing, canoeing and kayaking, and more. The unique and irreplaceable nature of these natural resources, together with their importance to the local community and economy, warrants a more stringent level of protection through permitted effluent limitations than is currently provided by the existing and draft permits.

2. Graves Creek has long been used for swimming and whole-body contact recreation. Mardis Mill Falls is a popular swimming hole and scenic waterfall. It is actively promoted by local governments, including the Town of Blountsville, and other groups for contact recreation and tourism. *See* Exh. 1. Graves Creek is currently classified as Fish and Wildlife (F&W) but not Swimming and Other Whole-Body Water-Contact Sports (S). Graves Creek clearly should be classified as S, and it merits protection at least as stringent as required for S waters because of its current and historical use for swimming and whole-body contact recreation. However, even this level of protection does not fully address all concerns for all pollutant parameters in the Tyson permit.

ADEM has the evidence and the discretion to justify more stringent limitations for several pollutants discharged into Graves Creek. We believe ADEM can and must do more to prevent potential harm to Graves Creek and to members of the public who swim and recreate there. The Draft Permit, as currently written, risks illness or injury to the public and further degradation of a watershed that is already impaired. We urge ADEM to write more protective limitations which we explain and justify in subsequent comments.

3. Graves Creek flows into the Locust Fork of the Black Warrior River, which is an important resource and an immensely popular public recreation area. It is the location of the annual Locust Fork

Canoe & Kayak Races and Kids' Day on the River at King's Bend, Blount County's new scenic river overlook, a new public access point to the river, the popular "whitewater" paddling section of the Locust Fork, the historic Swann Covered Bridge, which is another popular public access point, and Powell Falls, among other highlights and attractions. The Locust Fork is also a nutrient impaired waterbody with a Nutrient TMDL established in 2017. *See* Map for Graves Creek and Locust Fork Points of Interest.

4. Development and implementation of the TMDLs for DO/OE in Graves Creek and "Nutrients" in the Locust Fork are important steps forward toward protecting Graves Creek, the Locust Fork, and the public interest. However, the TMDLs do not address nutrients other than phosphorus. Development of a TMDL does not mean restoration has been achieved. Neither Graves Creek nor the Locust Fork have been 'restored.' Both still require additional protection beyond that provided by the Draft Permit.

5. The Draft Permit proposes to allow a second discharge (DSN005) at some point on the Locust Fork. The location is unclear because the Application (Form 2C, Page 1) indicates one location but other information indicates a requested change of location on Locust Fork. At least three Locust Fork discharge locations have been considered in some capacity. Furthermore, the location provided by ADEM on the map included with its 3/31/17 Waste Load Allocation Summary (34.02364, -86.57308) does not correspond to the location provided by Tyson in its 4/9/19 Application (34.032139, -86.566111).

Separate correspondence from Tyson now indicates that it no longer intends to pursue permitting of DSN005. Therefore, all references to the second proposed outfall (DSN005) must be deleted from the Draft Permit before it is finalized.

6. The line diagram provided by Tyson in its Application does not provide enough process information. There is no line diagram for the planned wastewater upgrades. The Application indicates there are no process changes planned, but there obviously are. We request that ADEM require and provide a new line diagram and process/treatment specifications to show the planned upgrades, which would convey valuable information needed to evaluate the planned capabilities while preserving proprietary information.

For each unit on the line diagram we request information regarding the type of unit/process, its purpose, the input and output design flow rates, and the design end target parameters for conventional and nonconventional pollutants. The line diagram of the existing processes in the Application should have had similar information. Complete characteristic and effluent information for every outfall should be required. Without this type of information, the public cannot effectively evaluate the proposed permit and make informed comments. The lack of this information represents an inappropriate limitation on the public's ability to make informed comments. Moreover, we cannot understand how ADEM could have adequately reviewed the application and processed the Draft Permit without such information. We ask the Department to obtain this and other missing information, incorporate it into the Permit and reissue the Permit for public comments.

7. According to the compliance and engineering plans, a construction permit application should have already been submitted to ADEM and construction should have commenced by now (if ADEM has approved the construction permit). Accordingly, we request that ADEM verify (1) that the proposed

compliance plan is on schedule; (2) that the construction permit has been approved; and (3) that construction has commenced. Otherwise, we request that ADEM update the compliance plan schedule and accelerate it to at least maintain the original compliance dates, if not advance them where possible.

8. We request that ADEM clarify the discharge flow rate proposed to be permitted. The previous (2012) permit was based on 1.225 MGD. The Application (ADEM Item 2c., page 7) indicates the monthly average for the highest flow year of the last five years was 1.613 MGD; the corresponding value for the last twelve months (with reference to the date of submittal in 2018) was 1.427 MGD. From Page V-1 of EPA Form 2C, the Applicant lists the maximum 30-day value as 1.693 MGD; the maximum daily value as 2.23 MGD; and the long-term average value as 1.338. But on Page 1 of 4 of EPA form 2C, the stated long-term average totals 1.388 MGD. What are the anticipated seasonal design flow ranges?

We understand that the two forms are calling for slightly different information but it all conflicts with Tyson's statement in correspondence to ADEM, dated September 21, 2018, that Tyson is investing in sustainable measures to reduce water usage. Reduction of water usage is the stated basis upon which Tyson requests high interim total phosphorus limits to be stated in daily loading (pounds per day) rather than as an effluent concentration limit so as not to be penalized for reducing water usage.

The WLA performed by ADEM is stated to be the "existing discharge design flow" (see Waste Load Allocation Summary). But that value (1.339 MGD) is apparently not a true wastewater process design flow. It is not possible to say based on the application what the process design flow is, neither at present nor that planned for the pending upgrade. We ask ADEM to verify the appropriate value. Without that information we believe the more realistic and appropriate flow rate to use would be either the maximum 30-day value (1.693 MGD from page V-1of EPA form) or else the monthly highest flow year monthly average of last 5 years (1.614 MGD from page 7 of the ADEM form). We are not suggesting a higher value merely to bias the results. The highest flow rate reported by Tyson is 2.230 MGD. Rather, our suggested value arguably represents the average daily values known to have been sustained for an entire 30-day period for the existing process design. The value is 26% higher than that value used in the existing WLA. That difference will be significant in low flow periods. The only way to know is to request that ADEM perform the analysis in an updated WLA.

9. We ask for clarification on the meaning of the design flow within the framework of the Draft Permit. Concentration limits are calculated from the mass loading and the presumed design flow rate. But if the flow rate increases, Tyson should not then be allowed to discharge the higher flow rate at the same concentration limits; that would result in an increased mass loading. This is the inverse of the problem Tyson noticed when it asked for limits for total phosphorus to be stated in pounds per day so it would not be penalized if water use reductions occur. Similarly, we believe the selected design flow rate should be a hard limit, or else the permit limits should have a concomitant table of maximum mass loading rates that are also limits; the mass loading rates would be based on the concentration limits and the design flow. Tyson could then potentially increase its flow, but only if it keeps the daily mass loading below the permitted mass loading limits.

10. The WLA performed by ADEM was a seasonal model but the discharge design flow rate was not seasonally adjusted. We suspect ADEM has a better body of data to determine discharge design flow

(see for example ADEM Fact Sheet unlabeled Table, which appears to be taken from DMRs on record). In fact, every daily flow value but three provided in that ADEM table exceeds the assumed flow rate (1.339 MGD) upon which ADEM's WLA was based. At the same time, we note that the value of 1.339 MGD was the design flow used by ADEM in development of the 2017 TMDL.

Critically, the WLA did not account for stormwater flows or for constituents in the stormwater flows. While that might be ordinary practice for many facilities, it presumes stormwater is not a major flow component and that stormwater is uncontaminated. The record demonstrates that those presumptions are simply not valid in this case. Stormwater is discussed in a separate comment, but we suspect that stormwater from the Tyson facility is a major flow component and has substantial amounts of nitrogen and very possibly other contaminants including phosphorus, BOD, suspended solids, and bacteria. ADEM has a duty to address stormwater pollution in this permit: industrial stormwater permits must meet all applicable provisions of the Clean Water Act, *see* 33 U.S.C. 1342(p)(3)(A). ADEM has failed to consider or address the substantial impacts of Tyson's stormwater in this permit.

11. ADEM proposes in the Permit to allow interim limits for total phosphorus, a critical impairment nutrient in the watershed. The proposed limits are 329.15 pounds per day from the permit effective date until to March 31, 2020, and then 14.6 pounds per day from April 1, 2020 until April 1, 2022. The first value is more than 1,300 times the relevant established TMDL (0.25 mg/L Total P concentration in effluent); the subsequent value is five times the TMDL.

We understand that it will take some time for Tyson to upgrade its system to meet the TMDL for total phosphorus. We do not understand, however, the basis for the timeframe or the excessively high first interim limit for total P. ADEM cites BPJ for the basis. *See* Fact Sheet. Unfortunately, there is no discussion of the underlying rationale nor does ADEM state the basis for its BPJ. In the absence of any rationale, it seems apparent that the only basis is the mere fact that Tyson requested those interim levels in its September 21, 2018, letter to ADEM. In that letter Tyson only requested the second interim limit (1.25 mg/L beginning April 1, 2020); neither the letter nor anything else we can find requests or discusses the first interim limit. It seems to have been developed by ADEM on its own initiative. ADEM states, "[t]he initial TP limit of 28.19 mg/L *[equivalent to the 329.15 lbs./day based on a daily flow of 1.4 MGD]* is based on the 100th percentile of the last 3 years DMRs submitted to the Department." *See* Fact Sheet (emphasis added). That value is also the 100th percentile of the last 7 years. It is, in fact, higher than the Maximum 30-Day Value of average of daily values, ever, which is reported as 22.1 mg/L or 238.0 PPD (lbs/day) by Tyson on page V-2 of EPA Form 2C. We must question whether Tyson even needs the higher level proposed by ADEM.

While we recognize the need for some latitude for Tyson during an interim period, we nevertheless request ADEM to either better explain and support an objective, rational basis for the first interim limit or else amend the draft permit. We believe it is inappropriate public policy for ADEM to openly draft into a permit an allowance to discharge during an interim compliance period a pollutant at levels nearing or at the highest an entity has ever historically discharged, higher in fact than has been recorded in the last three years.

Without more process information and more information regarding Tyson's upgraded treatment plans, ADEM cannot justify the need for a higher first interim permit level. That omission of process information is itself a deficiency of the Application and the Permit. We request Tyson or ADEM to state the current (recent and anticipated) average and normal operating range for Total P assuming the treatment process is operating properly now. We also request more complete information regarding all other sources of phosphorus from the facility, including stormwater discharges.

A more recent average for Total P from ADEM's own chart is closer to 18.2 mg/L. This average may be unreasonably low as a permit limit because Tyson could not regularly meet it given the recent data (unless Tyson provides better recent information that differs, as requested, above). If the data is close to normally distributed then a reasonable allowance is to add another third, for a resultant limit of 24.2 mg/L (if the data is lognormal then we request that Tyson or ADEM show that fact and recalculate a limit). We note again that in proposing the first and second interim values of 329.15 lbs./day and 14.6 lbs./day, respectively, ADEM rounded the flow rate basis up to 1.4 MGD. Assuming that flow rate, then 24.2 mg/L would equate to 282.6 PPD (lbs/day) Total P. The entire concept of a first interim limit will, of course, be obviated if the permit process extends beyond the proposed April 1, 2020 date. So, protracting the permit process actually works in Tyson's favor. If there must be a higher first interim permit level for Total P, we request the limit be no higher than 283 pounds per day for the Monthly Average.

The Permit does not include a Daily Maximum for Total P; it only has to be reported. This omission needs correction. ADEM must calculate and impose a Daily Maximum limit for Total P for each compliance period and for the long term.

12. Regarding the second interim permit level for total phosphorus, 1.25 mg/L as a Monthly Average from April 1, 2020 to April 1, 2022, there is no stated basis other than Tyson's own proposal and compliance schedule. Tyson states that this second interim level, described as Phase 1 of planned upgrades, would represent a 95% reduction of Total P from their proposed first interim limit, discussed above. That statement is true; it represents substantial beneficial progress for the public and for Graves Creek and the Locust Fork. Still, there must be a Daily Maximum.

13. The Draft Permit does not have a limit on total phosphorus during the November-February winter season. The effluent value is merely required to be measured and reported. We understand the lack of a Total P limit for winter months is likely based on the fact that the Federal Effluent Guideline Limitation (EGL) for Total P only pertains to summer months, not winter months. But the EGL is a minimum level of control; nothing precludes additional levels of control by a State. ADEM is mandated to protect human health and the environment and the purpose of the TMDL is to restore and maintain waterbodies to their healthy natural state. Nothing in the TMDL precludes a winter limit for Total P. We believe the unique circumstances of Graves Creek and the Locust Fork warrant a winter limit even if one is not generally required in other settings. This is especially true for Total P given its potential for accumulation, storage, and subsequent release into the receiving waterbodies.

Unlike some other pollutants, phosphorus will not be readily assimilated in the receiving waterbodies. The majority of Total P will likely be stored in the system attached to algae, suspended solids, and soil and sediment particles. It can be stored in the system and available during the ensuing

summer months for metabolic uptake by deleterious algae and bacteria, including cyanobacteria which phosphorus is known to promote. In essence, the wetlands and sediments act as a sink for phosphorus, which is then released under later, periodically favorable conditions. There is a natural phosphorus cycle between sediment and the waterbody which continually resupplies stored phosphorus to the waterbody. Recent academic research in the Graves Creek watershed well illustrates this point. *See* Exh. 2. We ask ADEM to carefully consider the implications of this research and revise the Permit to include winter limits on Total P.

This potential is beyond the public's ability to evaluate but we believe it is incumbent on ADEM to consider and protect against the continuing release of phosphorus. Eventually the accumulation of winter phosphorus will lead to excessive growth of deleterious and opportunistic algae in the waterbodies. It might be gradual or more likely it could happen at a sudden unknown point when other environmental conditions are ripe. We want to guard against a situation perhaps several years from now when there might be what seems to be a sudden algae bloom, when in reality the precursor phosphorus is being discharged during each winter month.

Two other considerations suggest that a winter limit on Total P is both reasonable and necessary. Tyson is apparently upgrading its treatment system to include phosphorus removal. There is little reason that system should not work in Alabama during winter months. Does Tyson plan to curtail phosphorus removal during winter and then restart processes the following season? Again, we ask for information regarding the design treatment levels and ranges that the planned process and system will be capable of reasonably and normally achieving. What is the design effluent total phosphorus concentration (range) that Tyson is planning for winter months? Without that information we cannot fully evaluate and make informed public comments.

The Federal EGL for Total P from poultry processing was developed in 2004 and was based on older technology and economic considerations. Since then the awareness of the deleterious effects of phosphorus in natural waterbodies has advanced significantly. The technologies for Total P removal have become better known, even conventional and readily achievable. The considerations for identifying best practicable technology (BPT) and best available control technology (BACT) have also evolved dramatically.

EPA is statutorily required to review its EGLs but has failed to do so. In fact, EPA is currently being sued to require it to do so. Therefore, the observation that EPA has not developed additional winter limits on Total P cannot be construed to mean they are not warranted, at least on a case-by-case basis. Certainly, ADEM has the duty and authority now to include additional limits in the Permit. We believe it is highly unlikely that Tyson is unaware of the trend in regulation of total phosphorus and total nitrogen.

ADEM should ask why Tyson would invest in a major upgrade that can only meet current EGLs when it could be aware that additional EGLs are likely forthcoming that could require a second upgrade and additional investment. We hope that Tyson's planned upgrades under the Draft Permit Compliance Schedule anticipate likely new EGLs. If Tyson is planning to be able to meet certain levels, then they could be written into the permit now without requiring additional effort from Tyson or ADEM at a later date. This approach is not just more efficient, it is more protective of the public interest and natural

resources. This approach also prevents ADEM and Tyson from being in "scramble" mode to meet future EGLs.

Additionally, it is our understanding that salts are a byproduct of the phosphorus removal process. As ADEM requires increased removal of phosphorus on the schedule of compliance included in the permit, it is likely that the process could introduce an increasing quantity of salts to the discharge from Tyson that is unregulated by the permit. Salts can be harmful to freshwater ecosystems and aquatic life and the Blountsville processing plant has been having serious NPDES toxicity violations. We request that ADEM evaluate the phosphorus removal techniques to be employed by Tyson, determine which salts may be generated by that process, and require monitoring and limitation(s) for the applicable salts generated by Tyson's wastewater treatment processes. Without monitoring and limitation for salts, there is no way for ADEM or the public to understand the role salts may be playing in Tyson's wastewater treatment compliance or lack thereof. Without the accountability provided by permit limitations, there will be no way to ensure water quality in Graves Creek and the Locust Fork downstream is being protected.

14. Nitrate compounds are an incredibly serious problem in Graves Creek and the Locust Fork. We make similar information and permit limit requests with respect to total nitrogen (TN), only with even more urgency. Is Tyson planning nitrification/denitrification treatment processes? If so, to what level? Do the permit application and the Permit account for all sources of nitrogen from the facility? What are achievable compliance limits that could be written into the Permit? The proposed TN limits are excessively high and are in fact higher than Tyson reports that it already achieves (see discussion and information request, below).

We request that Tyson commit to treatment for nitrogen removal from its effluent to BACT. We understand that Tyson is planning some level of additional denitrification for nitrogen removal from effluent but there is no way to know details or the design effluent goals for nitrogen reduction. We request ADEM obtain specific information and base the TN limits, both summer and winter, on those real-world achievable levels. If Tyson is planning a denitrification system, then we request information regarding the planned design effluent concentration range for TN. We understand that any final TN limits need to be balanced in light of the actual operating range of the treatment facility when it is operating properly. But, 'properly' is the operative word. We are not suggesting setting the limits so low that Tyson will repeatedly trigger exceedances and non-compliance even when their system is properly operating. But, the proposed limits are artificially too high at the other end. The difficulty is that the public has not been told what that true operating range is. The design range is also partly a function of limits established by the regulatory agency based on the requirement to attain specific water quality and instream goals. Therefore, it is incumbent on ADEM to do the work to push the goals recognizing the nutrient problem in the streams and the technology that is now readily available. We request that both Tyson and ADEM make every effort to implement more progressive and beneficial limits for TN to better protect Graves Creek and the Locust Fork. It would be a win-win for all concerned.

Total nitrogen is another matter where EPA is currently being sued to review and revise its EGLs for TN to reflect current BPT and BACT. We believe the time is near when Tyson and ADEM will be forced to require denitrification and we can see no reason to delay, especially given the heightened value

and sensitivity of Graves Creek and the Locust Fork (as already nutrient impaired systems) as well as their consistent public use and importance to the local economy.

15. A 2018 study of EPA Toxics Release Inventory (TRI) water pollution data from slaughterhouses by Environmental Integrity Project (EIP) indicates that Tyson's 2017 average nitrogen load (from effluent discharge) was 875 lbs/day (or approximately 75 mg/L). If accurate, that means that Tyson has the third highest discharge of nitrogen to an impaired waterway in the nation. In comparison, the same study indicates that other poultry processors, including Tyson facilities, are capable of discharging nitrogen concentrations in the range of 2 mg/L to 10 mg/L. Given the nutrients and nitrates problem in the watershed, we believe Tyson can and should plan to achieve lower treatment levels. We believe these lower levels will be necessary to attain the EGL for chlorophyll A and, therefore, must be required now.

16. Currently, the Permit includes limits for TN that correspond to EPA's EGLs (103 mg/L monthly average; 147 mg/L daily maximum). But if we understand the Application correctly, Tyson does not require such high limits, even at present. In its application, Tyson reports a Maximum Daily Value of 98.5 mg/L TN (equivalent to mass load of 1,222 lbs./day) and Long-Term Average value of 44.2 mg/L TN (but compare these values to the 2017 average value of 75 mg/L discussed above).

In comparison, water quality measurements performed by Black Warrior Riverkeeper demonstrate the effect that excessive nitrogen discharges from Tyson have on downstream waters. The nitrate concentration in Graves Creek, just below Mardis Mill Falls on 6/25/2019 measured 42.86 mg/L. On 10/31/2018, the nitrate concentration there was 30.17 mg/L. In the Locust Fork, approximately 16 river miles downstream of Graves Creek at the CR 13 bridge, the average nitrate concentration during 2018 was 1.96 mg/L. The average nitrate concentration on the Sipsey Fork throughout 2018 was 0.45 mg/L, or less than ¼ of the average on the Locust. Absent other information, it seems apparent that nitrates in Graves Creek are substantially due to discharges from the Tyson-Blountsville facility, and is highly likely that those discharges also contribute to the elevated nitrate concentrations in the Locust Fork.

The Permit should, at a minimum, be revised on an interim basis to reduce TN limits to the already achievable real-world values and further to reflect Tyson's planned upgrades for nitrogen removal (again we request that information). What are Tyson's plans and goals for nitrogen reductions in its effluent? What is BACT for nitrogen removal? Ultimately, TN limits in the Draft Permit need to reflect the level necessary to achieve all water quality requirements and goals, including those for nitrogen reductions to reduce algal populations.

Lacking any other information, we request that ADEM revise the Permit to require an interim monthly average limit for TN of 20 mg/L and a Daily Maximum of no more than 36 mg/L. Ideally, any TN limitations would be based on water quality modeling, and mathematical calculations of the amount of nitrogen that the Graves Creek and Locust Fork watersheds can assimilate without contributing to the ongoing proliferation of Chlorophyll-a. Because ADEM has provided no data and no modeling for nitrogen, the proposed limitations for TN are based on the percent reductions in the permit from the EGL for ammonia. The draft NPDES permit calculated water quality based effluent limitations (WQBELs) for ammonia that are approximately 19% and 25% of the EGL. In the absence of more

relevant data, we believe that a similar reduction for total nitrogen is warranted to protect downstream waters and to help achieve the chlorophyll-a reductions required by the TMDL. We also request that monitoring for TN and nitrite plus nitrate (as N) be required weekly as it is for other nitrogen components. Even municipal WWTPs, which typically produce far less nitrogen than Tyson, are required to monitor these parameters at least monthly.

Ultimately, we request the planned upgrades be capable of reducing TN to a Monthly Average of 2 mg/L and a Daily Maximum of 6 mg/L. Tyson has met these levels at other facilities and Tyson's consultant engineering firm has designed other facilities that exceed these levels. Otherwise, we request that ADEM determine, discuss, and require implementation of best available control technology (BACT) for nitrogen/nitrates. If there is a facility that warrants such an increased investment and level of public care, it is Tyson's Blountsville facility.

17. We believe the source and level of nitrates from the Tyson Blountsville facility have not been fully evaluated for the Draft Permit. Tyson's Toxics Release Inventory (TRI) Form R for 2017 states that Tysons released 1,484,230 pounds of nitrate compounds into Graves Creek (approximately 4,066 pounds per day). *See also* EIP – Water Pollution from Slaughterhouses. We understand that the nuances of TRI reporting make utilization of the reported value potentially misleading, but nothing in the permit application or Draft Permit comes close to accounting for such a high level of nitrates. We request ADEM to verify this information with Tyson and, if accurate, determine the source of the excessively high nitrates, and then to modify the Permit to account for and reduce levels of discharged nitrates from each and every source.

We suspect the additional amounts of nitrates are in treatment processes for which we have no information and/or stormwater discharges (although recent reports of stormwater concentrations do not necessarily reflect the same). Regardless, it is imperative that ADEM account for and require reduction in a revised Draft Permit for all nitrate sources from the facility. There is no other way for ADEM to meet other required regulatory goals for nutrients in the watershed.

Prior to ADEM issuing any Permit, we request additional opportunity for public comment on steps ADEM intends to take toward nitrates reductions. Absent additional clarification and information the public cannot be expected to fully and meaningfully participate. If the TRI information is correct, it is remarkable (and frankly, objectionable) that this issue is either missed or glossed over in reviewing the application and the Permit. The TMDL requirement to attain 18 µ/L chlorophyll-a is not optional. It is a duty of ADEM to implement measures at both point and nonpoint source discharges to attain this instream level. Compliance schedules are essential, beginning with nitrates discharged by Tyson.

We request the Permit be revised to require weekly monitoring/measurement for total nitrogen and for nitrite plus nitrate total, as is common (*see, e.g.,* ADEM's NPDES permit AL0002119 for Koch Foods of Gadsden). The lack of information and the variability in nitrogen warrants the increased monitoring frequency. The difference between the proposed monthly average and the daily maximum can make a tremendous difference in the watershed. The daily maximum should provide the reasonable margin and the monthly average should reflect the design operating parameters of a properly operating treatment facility. If only quarterly monitoring is provided, then there is no way to determine compliance or verify proper operating conditions because there is only one available reported value.

18. Correspondence associated with the Permit indicates there is an industry work group in the Locust Fork watershed to perform instream monitoring, propose interim limits, and propose a compliance schedule to bring the Locust Fork into compliance with the chlorophyll-a (chlorophyll) value of 18 µ/L value required by the TMDL. We request the opportunity to join the workgroup.

19. The Application indicates there have been no past compliance matters, but there have been. Unfortunately, neither the Permit nor the Fact Sheet discusses past noncompliance or violations. We believe each permit review by ADEM should include an evaluation of all past noncompliance issues and each new permit should include specific measures to prevent future noncompliance. We believe that information should be explicitly provided in each draft permit for public comment. Without complete and transparent information the public cannot make meaningful, informed comments. Therefore, we request that ADEM provide the public with <u>all</u> information regarding past noncompliance by the Tyson Blountsville facility and to require specific measures to prevent future noncompliance in the Permit.

20. A cursory review suggests at least the following types of noncompliance by Tyson have occurred (this list is not intended to be comprehensive):

Tyson Farms Blountsville NPDES Permit Violations				
Date	**Outfall #**	**Parameter**	**Permit Limit pounds per day (ppd)**	**Discharge ppd**
August 6th, 2014	001	BOD	70.3 ppd (daily max)	84.0 ppd
August 2014	001	BOD	46.9 ppd (monthly avg.)	50.2 ppd
May 12th, 2016	001	BOD	70.3 ppd (daily max)	71.5 ppd
November 1-3, 2016	001	BOD	70.3 ppd (daily max)	91.7 ppd
April 2017	001	BOD	86.0 ppd (daily max)	92.0 ppd
August 24th, 2017	001	Ammonia	2.4 mg/L (daily max)	2.6 mg/L
August 24th, 2017	001	Ammonia	18.8 ppd (daily max)	28.7 ppd
August 24th, 2017	001	TKN	4.8 mg/L (daily max)	5.5 mg/L
February 6th, 2018	001	Toxicity	Pass	Fail
February 8th, 2018	001	BOD	129 ppd (daily max)	155 ppd
March 2018	001	Toxicity	Pass	Fail
June 26th 2018	001	Toxicity	Pass	Fail
July 17th, 2018	001	Toxicity	Pass	Fail
July 24th, 2018	001	Toxicity	Pass	Fail
August 2018	001	Toxicity	Pass	Fail
September 18th, 2018	001	Toxicity	Pass	Fail
October 2nd, 2018	001	Toxicity	Pass	Fail
November 6th, 2018	001	Toxicity	Pass	Fail
January 14th, 2019	001	Toxicity	Pass	Fail
February 4th, 2019	001	Toxicity	Pass	Fail
February 11th, 2019	001	Toxicity	Pass	Fail
February 25th, 2019	001	Toxicity	Pass	Fail

Date	Outfall #	Parameter	Permit Limit pounds per day (ppd)	Discharge ppd
March 5th, 2019	001	Toxicity	Pass	Fail
March 25th, 2019	001	Toxicity	Pass	Fail

21. The limited amount of information available regarding past noncompliance makes it apparent that the Tyson Blountsville facility has a recurring toxicity problem. The permit application and the Draft Permit do not disclose this information and do not adequately address the problem. On May 12, 2018, ADEM issued Tyson an NOV and required Tyson to complete a TIE/TRE. We can find no information regarding completion of a TIE or TRE or any corrective changes made. Yet ADEM inexplicably proposes to reissue the permit with the same quarterly toxicity monitoring, nothing more.

A review of the TIE/TRE prior to issuance of the permit is absolutely necessary because the findings of the toxicity studies could potentially identify sources or pollutants not previously considered by the permit writer that need to be regulated in order to assure that the toxic discharges from Tyson do not continue.

We request that before issuing a final permit, ADEM require Tyson to implement a full-scale toxicity reduction evaluation and to implement necessary corrections, changes, and improvements. We also request that thereafter Tyson be required to perform monthly toxicity monitoring, not the proposed quarterly monitoring.

22. For the public health reasons stated in our Comment 2 and Comment 3, we request that the Permit be revised to set discharge limitations for E. coli at 126 col/100ml monthly average and 298 col/100ml for both May-October season and November-April season. The public will certainly be in both Graves Creek and the Locust Fork during winter season; it cannot be avoided. While ADEM has a set swimming season of May-October, winter is the wet season for paddlers. Many people access these waters during the winter season too; thousands of people regularly canoe and kayak in the receiving streams due to increased flows.

The following table presents bacteria concentrations in Tyson's stormwater discharges at levels that endanger public safety. This information could be incomplete, but it represents a long-term endangerment to the public that absolutely must be addressed and corrected.

Tyson Foods Inc. - Blountsville - Bacteria Counts					
Date	Outfall #	Discharge Volume	Bacteria	Discharge Concentration	Recreational Water Quality Standard
1st Half 2011	002S	0.1643 MGD	Fecal Coliform	5,588 col./100mL	100 col./100mL
1st Half 2011	004S	0.0132 MGD	Fecal Coliform	1,958 col./100mL	100 col./100mL
2nd Half 2011	004S	0.6525 MGD	Fecal Coliform	1,390 col./100mL	100 col./100mL
2nd Half 2012	002S	0.0896 MGD	E. Coli	>600 col./100mL	126 col./100mL
2nd Half 2012	004S	0.0072 MGD	E. Coli	224 col./100mL	126 col./100mL
1st Half 2013	002S	0.0732 MGD	E. Coli	>320 col./100mL	126 col./100mL

Date	Outfall #	Discharge Volume	Bacteria	Discharge Concentration	Recreational Water Quality Standard
1st Half 2013	004S	0.9150 MGD	E. Coli	889 col./100mL	126 col./100mL
2nd Half 2013	002S	0.1868 MGD	E. Coli	1,783 col./100mL	126 col./100mL
2nd Half 2013	004S	0.1763 MGD	E. Coli	4,680 col./100mL	126 col./100mL
1st Half 2014	002S	0.1868 MGD	E. Coli	3,994 col./100mL	126 col./100mL
2nd Half 2014	002S	0.0091 MGD	E. Coli	300 col./100mL	126 col./100mL
2nd Half 2014	004S	0.3990 MGD	E. Coli	5,883 col./100mL	126 col./100mL
1st Half 2015	002S	0.0867 MGD	E. coli	10,200 col./100mL	126 col./100mL
1st Half 2015	003S	0.0870 MGD	E. coli	1,400 col./100mL	126 col./100mL
1st Half 2015	004S	0.0070 MGD	E. coli	1,900 col./100mL	126 col./100mL
2nd Half 2015	002S	0.0194 MGD	E. coli	2,200 col./100mL	126 col./100mL
2nd Half 2015	003S	0.2420 MGD	E. coli	1,800 col./100mL	126 col./100mL
2nd Half 2015	004S	0.2430 MGD	E. coli	2,400 col./100mL	126 col./100mL
1st Half 2016	002S	0.0290 MGD	E. coli	3,700 col./100mL	126 col./100mL
1st Half 2016	003S	0.3616 MGD	E. coli	8,600 col./100mL	126 col./100mL
1st Half 2016	004S	0.3630 MGD	E. coli	6,300 col./100mL	126 col./100mL
2nd Half 2016	003S	No Discharge			
2nd Half 2016	004S	0.0420 MGD	E. coli	800 col./100mL	126 col./100mL
1st Half 2017	002S	0.532 MGD	E. coli	300 col./100mL	126 col./100mL
1st Half 2017	003S	0.075 MGD	E. coli	1,615 col./100mL	126 col./100mL
1st Half 2017	004S	0.0835 MGD	E. coli	1,850 col.100mL	126 col./100mL
2nd Half 2017	004S	0.0024 MGD	E. coli	400 col./100mL	126 col./100mL
2nd Half 2018	003S	.025 MGD	E. coli	500 col./100mL	126 col./100mL
2nd Half 2018	004S	0.315 MGD	E. coli	*T	126 col./100mL
1st Half 2019	002S	0.1897 MGD	E. coli	*T	126 col./100mL
1st Half 2019	003S	0.1905 MGD	E. coli	*T	126 col./100mL
1st Half 2019	004S	0.0152 MGD	E. coli	*T	126 col./100mL

Given the disturbing record and past lack of notice to the public, we further request that Tyson be required to notify ADEM and the public within 24-hours any time discharge effluent exceeds E. coli levels of 126 col./100ml Monthly Average and 298 col./100ml both summer and winter. We request requirement of that notification even if ADEM denies our request to impose those limits as mandatory permit limits, i.e., notify the public of the exceedance even if it does not represent Permit noncompliance. We do not believe it reasonable to expect the public to wait until the following month's report under Permit condition C.b., to learn of an exceedance. ADEM can require notification under the authority behind Permit condition B.2.a. (1) or (2) even if the exceedance is not noncompliance.

We also request that identical limits and notification for E. coli and fecal coliform exceedances above the limits be implemented for all of Tyson stormwater outfalls. As noted in the table above, discharged stormwater has historically exceeded water quality standards. During and immediately after storm events are popular times for recreation in downstream waters, as the additional flow creates more scenic vistas at Mardis Mill Falls and more enjoyable paddling in Graves Creek and the Locust Fork, so it is imperative to ensure that stormwater is properly regulated for the protection of public health.

Stormwater is a heightened concern that might otherwise be dismissed at most facilities. The Tyson Blountsville facility accumulates stormwater, some of which might have contacted waste operations and some general area stormwater. The unique facet is that periods of stormwater flow are the exact peak periods when the public is active in the water immediately downstream for recreation purposes. We know that stormwater quality is a function of some variables outside Tyson's control (nonpoint sources and wildlife, for example). But the stormwater from the facility is within Tyson's control and is Tyson's responsibility. While fecal coliform can come from many sources, E. coli is more particular to specific sources. Moreover, we are aware of academic research and presentations, specific to the wetlands to which Tyson discharges that have isolated DNA specific to *Bacteroides* strains particularly associated with adaptation to chicken gut. So, while there might be other sources generally, there is evidence that a substantial source is Tyson's poultry processing facility. We request that ADEM review all available information and to protect the public interest.

23. Stormwater control and quality remains too large an unknown variable. There is no discussion in the permit application, the Draft Permit, or the Fact Sheets regarding past volumes discharged and quality. Stormwater from a poultry processing facility may not be discharged except by permit; stormwater from the Tyson Blountsville facility is fully within the scope of NPDES permitting. All criteria, standards, and limitations apply directly to the stormwater in every respect. *See* 33 U.S. Code § 1342(p)(2)(E). It must not and may not be glossed over by ADEM in the Permit.

Stormwater from the Tyson facility is a major flow component and can have substantial amounts of nitrogen and very possibly other contaminants including phosphorus, BOD, suspended solids, and bacteria. We request information regarding volumes of stormwater to be discharged, periodicity, and data regarding past water quality for all parameters. We cannot find where ADEM has evaluated stormwater in this manner. Without that level of evaluation ADEM cannot rely on the other permitting components to be meaningful in meeting water quality objectives. Without that level of information, the public cannot make meaningful public comment.

The permit application states that contaminated stormwater is conveyed to the Treatment Lagoon but there is no information regarding provisions for determination and segregation of contaminated stormwater from uncontaminated stormwater. In the absence of better information, the area of stormwater lagoons appears to be roughly 7 acres plus an unknown volume of above ground storage tanks (compared to a total of approximately 17.5 acres of the three treatment lagoons), so stormwater volumes and flows are obviously a sizable factor. Again, given the absence of information, it is not inconceivable that a one-inch rainfall event could generate nearly 450,000 gallons or more of stormwater.

If ADEM has fully evaluated volumes, quality, and controls for stormwater, then we request that data prior to concluding public comments. If ADEM does not have such data or has not done that level of review, then we request that be completed prior to revising the Permit and any subsequent permit issuance. We believe that unless Tyson provides a complete Stormwater Analysis and Control Plan to ADEM, ADEM cannot authoritatively make these determinations nor protect the public interest.

Apart from further stormwater evaluation, we specifically request that all permit limitations applicable to outfall DSN001, including the changes requested herein, be made explicitly applicable as

permit monitoring and limitation parameters for each stormwater outfall DSN002-DSN004. In the absence of data, no other requirement will be adequate or protective. It is imperative that ADEM and the public be able to be confident regarding the volumes, quality, and conditions of stormwater releases. There must be less emphasis on the vehicle for the pollutant (process water v. stormwater) and greater concern about limiting pollutants that are dangerous to human health and the environment, no matter the mode of transport.

We also request the SPCC plan and the BMPs required under Permit Condition Part IV A be made available to ADEM and that ADEM review and either approve or modify the SPCC plan. We request that the Permit be revised at Part IV, A.3., to require that the BMP plan for stormwater be reviewed and revised by Tyson and submitted to ADEM for review within thirty days from the effective date of the Permit. These are plans that should already be in place. The BMP plan and each BMP must be demonstrably capable of meeting specific numerical goals for all relevant parameters. Unfortunately, recent events on the Mulberry Fork at Tyson's Hanceville facility demonstrate that a lack of fundamental engineering analysis and planning as well as a lack of review and inspections by ADEM cannot be highlighted enough.

24. Graves Creek is unique hydrologically. Currently, it seems that much of its flow is dependent upon Tyson's discharge. That is one justification for the more protective limits we request. The situation is not natural, however. There should be a normal groundwater base flow that sustains Graves Creek in its pre-existing natural condition. We suspect that groundwater withdrawals by Tyson, and perhaps other users, is lowering the groundwater table too much and is damaging the normal base flow in Graves Creek upstream of Tyson's discharge. Local residents report that historically Graves Creek rarely went dry. They have important concerns regarding groundwater usage by Tyson and its effects on Graves Creek, and the context that sets for Tyson's decisions regarding withdrawals and discharges, and for ADEM's permitting decisions.

Tyson indicates (page 9 of ADEM Form) that it has provided ADEM with information on additional wells in its Attachment III (beyond the one mentioned in the permit application for which there is no technical information). Attachment III has not been provided to the public by ADEM. We request that ADEM provide Attachment III and any other attachments not yet provided to the public. We request ADEM review and determine whether groundwater usage by Tyson is reasonable and appropriate in relation to base flow requirements of Graves Creek, and to make that information, evaluation, and determinations available to the public for comment.

Tyson also indicates in its permit application that it is undertaking a water usage reduction initiative. Water usage at the Tyson Blountsville facility directly affects the public interest so we ask that Tyson be required to provide specific details and information regarding water usage reduction studies and strategies to be implemented.

25. The following Table summarizes the numeric permit limits that we request in our comments. We ask ADEM to review these recommended numeric limits and provide an explanation for each limit it chooses not to adopt.

Requested Revised Permit Limits AL0001449

Parameter	Monthly Avg.	Daily Max	Daily Min	Monthly Avg.	Daily Max	Monitoring Frequency	Sample Type	Season
DO	-	-	6	6 mg/L	-	Weekly	Grab	Dec-Apr
DO	-	-	6	6 mg/L	-	Weekly	Grad	May-Nov
BOD	118.44	177.67	-	10.6 mg/L	15.9 mg/L	Weekly	Comp	Dec-Apr
BOD	53.63	80.45	-	4.8 mg/L	7.2 mg/L	Weekly	Comp	May-Nov
COD	-	-	-	Report	Report	Monthly	Comp	Dec-Apr
COD	-	-	-	Report	Report	Monthly	Comp	Dec-Apr
pH	-	-	6.0 s.u.	-	8.5 s.u.	Weekly	Grab	Dec-Apr
pH	-	-	6.0 s.u.	-	8.5 s.u.	Weekly	Grab	May-Nov
TSS	-	-	-	20 mg/L	30 mg/L	Weekly	Comp	Dec-Apr
TSS	-	-	-	20mg/L	30 mg/L	Weekly	Comp	May-Nov
Oil/Grease	-	-	-	8 mg/L	14 mg/L	Weekly	Grab	Dec-Apr
Oil/Grease	-	-	-	8 mg/L	14 mg/L	Weekly	Grab	May-Nov
Total Ammonia	11.17	16.7	-	1.0 mg/L	1.5 mg/L	Weekly	Comp	Dec-Apr
Total Ammonia	11.7	16.7	-	1.0 mg/L	1.5 mg/L	Weekly	Comp	May-Nov
TKN	Note2	Note2	-	2.0 mg/L	3.0 mg/L	Weekly	Comp	Dec-Apr
TKN	Note2	Note2	-	2.0 mg/L	3.0 mg/L	Weekly	Comp	May-Nov
TP	Note2	Note2	-	0.25 mg/L	1.0 mg/L	Weekly	Comp	Mar-Oct
TP	Note2	Note2	-	0.25 mg/L	1.0 mg/L	Weekly	Comp	Nov-Feb
NOx-N	Note2	Note2	-	Report	Report	Weekly	Comp	Mar-Oct
NOx-N	Note2	Note2	-	Report	Report	Weekly	Comp	Nov-Feb
TN	Note2	Note2	-	20 mg/L	36 mg/L	Weekly	Comp	Mar-Oct
TN	Note2	Note2	-	20 mg/L	36 mg/L	Weekly	Comp	Nov-Feb
Flow	Note1	Note1	-	-	-	Daily	Totalizer	Dec-Apr

Parameter	Monthly Avg.	Daily Max	Daily Min	Monthly Avg.	Daily Max	Monitoring Frequency	Sample Type	Season
Flow	Note1	Note1	-	-	-	Daily	Totalizer	May-Nov
E.Coli	-	-	-	126 mg/L	298	Weekly	Grab	Dec-Apr
E.Coli	-	-	-	126 mg/L	298	Weekly	Grab	
Fecal Coliform	-	-	-	-	400 Col/100ml	Weekly	Grab	Dec-Apr
Fecal Coliform	-	-	-	-	400 Col/100ml	Weekly	Grab	May-Nov
Toxicity	-	P(0)/ F(1)	-	-	-	Monthly	Comp	Dec-Apr
Toxicity	-	P(0)/ F(1)	-	-	-	Monthly	Comp	May-Nov

Notes:

1) Specify Design Flows
2) Specify mass loading limits based on design flows

26. In support of the foregoing comments and requests, we cite the following EPA guidance statements in developing permit limits:

> *The goal of the permit writer is to derive effluent limitations that are enforceable, adequately account for effluent variability, consider available receiving water dilution, protect against acute and chronic impacts, account for compliance monitoring sampling frequency, and assure attainment of the WLA and water quality standards.*
>
> *[…] Further, because WLAs are calculated using critical receiving water conditions, the limiting LTA would also ensure that water quality criteria are fully protected under nearly all conditions.*
>
> *WQBELs must assure attainment of all applicable water quality criteria […].*

USEPA's NPDES Permit Writers' Manual § 6.4.1.2. Black Warrior Riverkeeper asks ADEM to meet these stated objectives in issuing the Permit. The future of Graves Creek and the Locust Fork are at stake.

Conclusion

We formally request that ADEM hold a public hearing on the Permit and provide all missing material from the Application and Permit file prior to that date. Should the Department schedule a public hearing in this matter, we request that ADEM notify Black Warrior Riverkeeper regarding the date, time, and location of any such hearing as soon as possible.

Thank you for your consideration of our comments. Please do not hesitate to contact us if you have any questions or if you require any additional information. We look forward to receiving a response to our comments from the Department, as well as notice of the Department's final permit decision.

For the River,

Nelson Brooke,
Riverkeeper
Black Warrior Riverkeeper

Keith Johnston
Managing Attorney
Southern Environmental Law Center

John Kinney
Staff Scientist
Black Warrior Riverkeeper

Eva Dillard
Staff Attorney
Black Warrior Riverkeeper

cc: Jeff Kitchens, Chief
ADEM Water Division

Daphne Lutz, Chief
ADEM Municipal and Industrial Branch

Scott Ramsey, Chief
ADEM Industrial Section

Mary Walker, Regional Administrator
EPA Region 4

Jeaneanne Gettle, Director
Water Protection Division

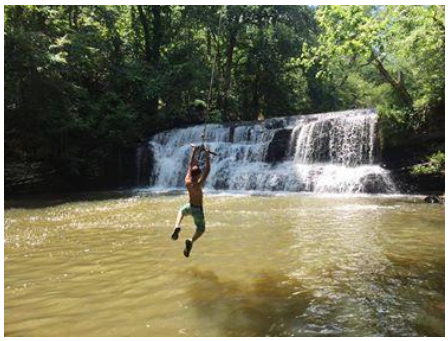
Exhibit 1

Exhibit 1

Photographs

Graves Creek – Mardis Mill Falls

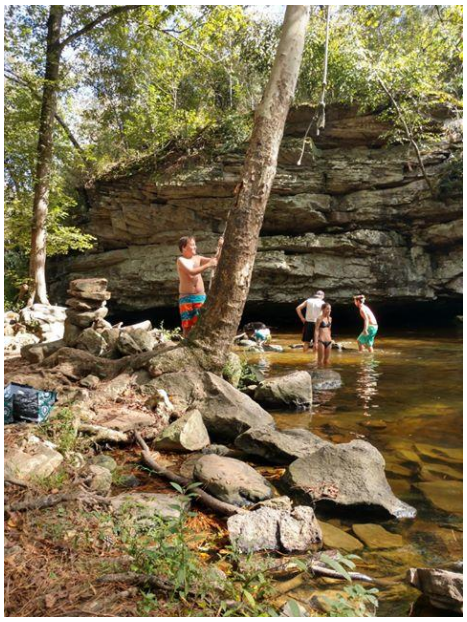
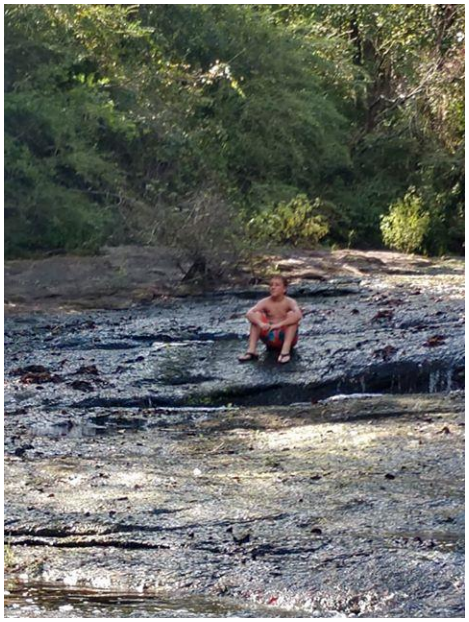




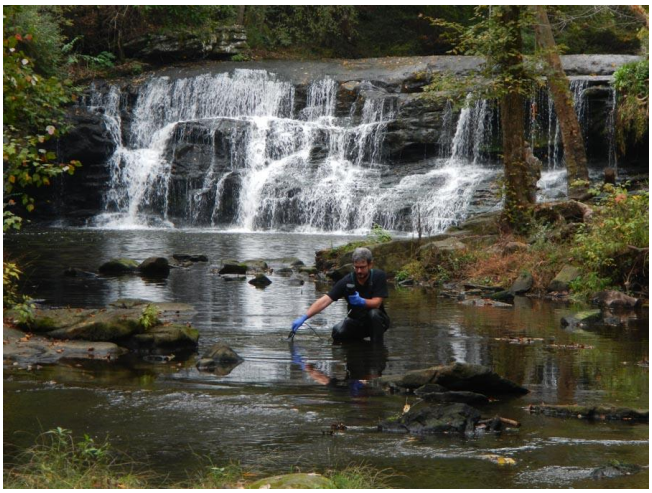


(foreign tourists)

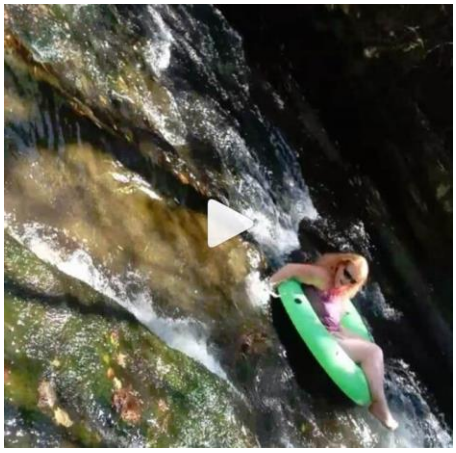
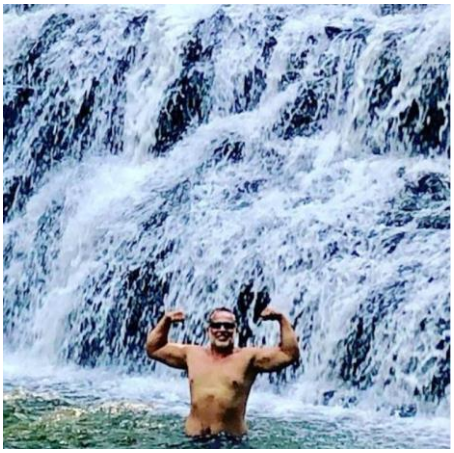




All above photos were submitted to Black Warrior Riverkeeper for use in these comments.

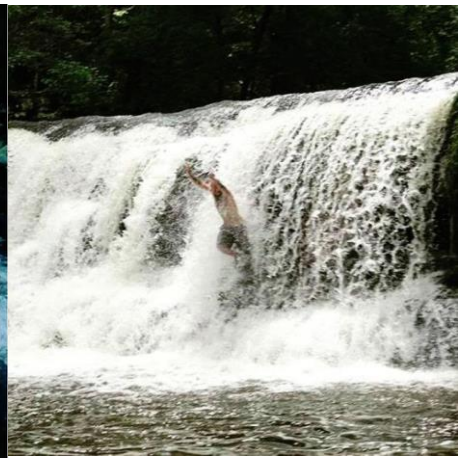
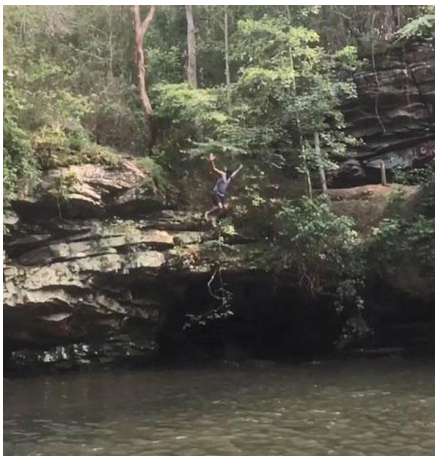
Fisherman

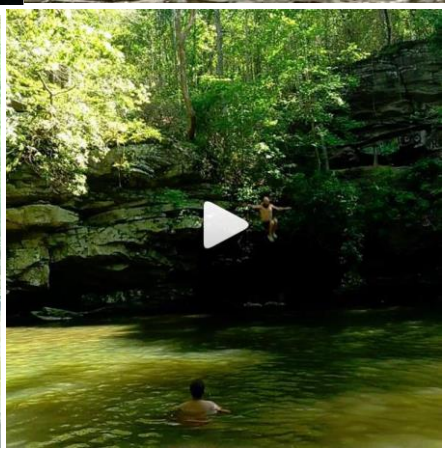


BWRk Staff Scientist John Kinney testing Graves Creek



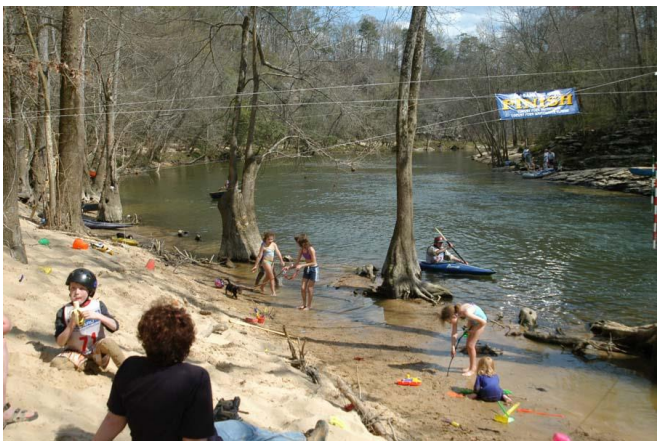





The prior 13 photos were pulled from Instagram.

Locust Fork


Locust Fork Tube Float




Locust Fork Canoe & Kayak Races


Kids' Day on the River

Exhibit 2

Effects of a Chicken Processing Plant on Graves Creek in Blount County

Emily Bridge & Elizabeth G. Dobbins, Ph.D.

Samford University, Department of Biological and Environmental Sciences, Birmingham, AL 35229

Abstract:

Nutrient pollution causes eutrophication of aquatic systems. Although eutrophication is associated with collapse of lotic ecosystems, rivers and streams are also impacted by excess nutrients. In 2014, Alabama reported 193 and 586 river miles impaired by nitrogen and phosphorus, respectively. Waste from animal feeding and processing operations may contribute to this nutrient loading. Alabama has numerous poultry operations, including an active chicken processing plant in Blount County. This plant discharges wastes into a wetland that empties into Graves Creek, a tributary of the Locust Fork of the Black Warrior River. We predicted that these discharges would result in higher conductivity and elevated levels of Nitrates and Phosphates in Graves Creek downstream of the plant compared to upstream. We collected duplicate water samples on three occasions at eight locations in Graves Creek, monitored the conductivity, and tested them for Nitrates and Phosphates using HACH colorimeter test. We also used a Spectrometer (Shimadzu ICPE-9000) to do elemental analysis of the water samples. Nitrates, and Phosphates downstream of the plant were significantly higher than upstream as were elemental calcium, potassium, sodium, phosphorus, and conductivity. Although Alabama does not regulate nitrates and phosphates in surface waters designated for "Fish and Wildlife," the levels in the discharge were higher than recommended for aquatic life by other states. The discharges of phosphorus from the wetland exceeded ADEM water quality criteria (AL 335-6-10) for aquatic life (≤ 1.0 mg/L). The discharges into Graves Creek have the potential to create eutrophication and contribute to Alabama's impaired waters.

Introduction:

- Alabama has abundant ground water that could infinitely sustain its inhabitants if minatained properly.
- Nitrates and unauthorized hazardous waste disposal sites are top sources of ground water pollution (ADEM, 2015).
- Nitrates are necessary for life. However, an overabundance of nitrate creates hypoxic conditions that threaten aquaticecosystems.
- Excess phosphate in water can cause eutrophication.
- The excess algae blooms that occur in response to eutrophication can make people sick if they come into contact with polluted water, consume tainted fish or shellfish, or drink contaminated water (EPA, 2015).
- Concentrated animal feeding operations (CAFOs) are sources of nitrate and phosphate pollution (Goodman, 1999).
- Discharge from concentrated animal feeding operations (CAFOs) enter creeks, rivers, and oceans through improper infiltration and surface runoff (EPA, 2015).
- Less is known of the effects of animal processing facilities on adjacent water systems.

Hypothesis:

We predicted that Graves Creek downstream from a wetland that filters runoff from a settling pond associated with a chicken processing plant would contain higher concentrations of nitrates and phosphates than upstream and that the increased levels of nitrate and phosphate would result in a higher conductivity downstream of the wetland discharge. We also predicted that the wetland would significantly decrease the concentration of nutrients compared to the concentrations in the settling ponds.

Methods:

- Graves Creek is located in the Locust Fork Watershed of the Black Warrior River in Northern Alabama (Fig 1).
- Samples were collected in Feb, April, and August.
- We collected 2 samples from each of 8 sites along Graves Creek (Fig 2).
- Samples were collected in acid washed, 250 mL plastic or glass bottles
- At each sample site, we measured the conductivity (HACH HQ14D).
- Samples were refrigerated (4 °C), then rewarmed (22 °C) to test for the presence of phosphates and nitrates using a Colorimeter (DR/890, HACH) and proprietary methods [phosphates (PhosVer 3 Phosphate Reagent, HACH), and nitrates (NitraVer X Test 'N Tube nitrate reagent, HACH)].
- After testing for nitrate and phosphate, samples were acidified (2% nitric acid) and analyzed for elements in water by spectrometry (Shimazdu, ICPE 9000).
- Differences in mean conductivity, nitrates, phosphates at different sites were compared using ANOVA (SPSS). Results were considered significant at $\alpha < 0.05$.

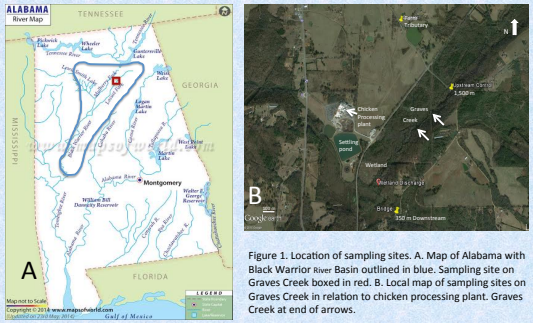


Figure 1. Location of sampling sites. A. Map of Alabama with Black Warrior River Basin outlined in blue. Sampling site on Graves Creek boxed in red. B. Local map of sampling sites on Graves Creek in relation to chicken processing plant. Graves Creek at end of arrows.

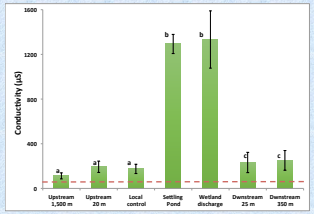


Figure 2. Comparison of mean conductivity of Graves Creek to wetland discharge and Settling Pond. Dotted line indicates mean conductivity in a farm stream that is a tributary to Graves Creek immediately upstream of the wetland. Letters indicate homogeneous populations (p <0.05) and bars indicate standard deviation.

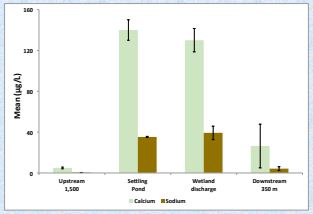


Figure 3. Comparison of mean concentration of calcium and sodium in Graves Creek. Both calcium and sodium were < 1 mg/L in a farm stream tributary of Graves Creek immediately upstream of the wetland. Error bars as in Figure 2.

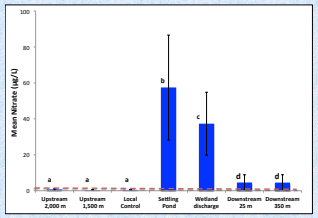


Figure 4. Comparison of mean nitrate concentration in Graves Creek to local nutrient sources including wetland and settling pond. Dotted line, letters and bars as in Figure 2.

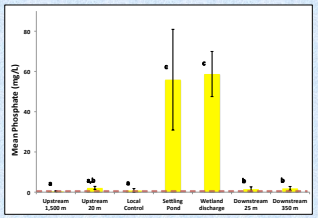


Figure 5. Comparison of mean phosphate concentration in Graves Creek to local nutrient sources including wetland and settling pond. Dotted line, letters and bars as in Figure 2.

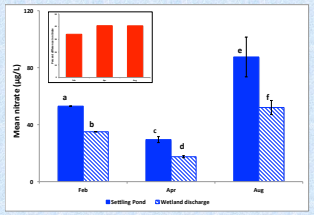


Figure 6. Comparison of mean nitrate concentration in nutrient sources. A. Insert of percent decrease in mean nitrogen between the settling pond and wetland discharge. Letters and bars as in Figure 2.

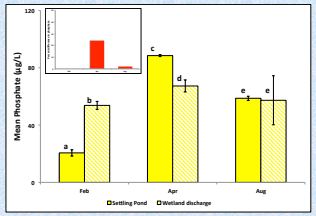


Figure 7. Comparison of mean phosphate concentration in nutrient sources. A. Insert of percent decrease in mean phosphate. Letters and bars as in Figure 2.

Results:

- Mean conductivity downstream of the wetland discharge was significantly greater than upstream ($F_{(7,73)} = 235.45$, $P < 0.001$). The conductivity in the discharge from the wetland mirrored that of the settling pond and was an order of magnitude larger than upstream controls (Fig. 2).
- The settling ponds and wetland discharge had concentrations of calcium and sodium at least two orders of magnitude greater than upstream Graves Creek (Fig 3). Iodine, potassium, magnesium, phosphorus, and sulfur were all at least an order of magnitude greater in the wetland discharge than upstream.
- Mean Phosphorus in the wetland discharge was 3.18 ± 1.42 mg/L.
- Nitrate concentration was significantly higher in sites downstream of the wetland discharge compared to upstream ($F_{(3,28)} = 4.705$, $P < 0.000$) (Fig. 4). Peak acute mean nitrate downstream of the wetland was 9.7 ± 0.7 mg/L.
- Mean nitrate was significantly higher in the settling pond than in the wetland discharge and both were significantly greater than upstream and downstream in Graves Creek ($F_{(6,42)} = 187.261$, $P < 0.001$) (Fig. 4).
- Mean phosphate concentration was significantly higher in sites downstream of the wetland discharge compared to upstream ($F_{(3,28)} = 4.705$, $P < 0.000$) (Fig. 5)
- Mean phosphate concentration was equivalent in the settling pond and wetland discharge, but significantly higher than upstream and downstream downstream in Graves Creek ($F_{(6,42)} = 31.695$, $P < 0.001$) (Fig. 5).
- There was seasonal variation in mean nitrate ($F_{(2,47)} = 53.994$, $P < 0.000$) (Fig. 6) and phosphate ($F_{(2,67)} = 5.423$, $P < 0.007$) (Fig. 7) concentrations. Nitrate had a three-fold concentration range in the settling pond, wetland discharge, and downstream of the discharge with lows in April and highs in August. Phosphate varied less with highs in April and the lows in February.
- The wetland removed up to 41% of the nitrate in the settling pond with a greater percent removal in April and August than in February (Fig. 6), but removed far less of the phosphate (Fig. 7).

Discussion:

- As hypothesized, nitrate and phosphate were higher downstream of the discharge from a wetland associated with a Chicken processing plant.
- Single samples of nitrate in Graves Creek exceeded the allowable maximum contaminant level (MCL) and the mean for the collection in February approached it, despite the fact upstream and local through farm properties did not exceed 1/10 of the MCL. This suggests that the chicken processing plant is altering the chemical stability of Graves Creek.
- The concentration of phosphorus from the wetland exceeded ADEM water quality criteria (AL 335-6-10) for aquatic life (≤ 1.0 mg/L).
- The Wetland does act to absorb some of the nutrients, particularly nitrates, but there is still a demonstrable effect on water chemistry.
- The most effective removal of nutrients by the wetland was during April in a season of rapid plant growth. The least effective was in February.
- The hypoxic effects of excess nutrients are persistent across decades in aquatic ecosystems (Jenny et al., 2015).
- These results suggest that more attention be given to the impacts of animal processing operations on Alabama's valuable resources and ecosystems.

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Effects of a Chicken Processing Plant on Graves Creek in Blount County

Samford University, Department of Biological and Environmental Sciences, Birmingham, AL 35229

Biological Sciences
Poster # 52
Emily Bridge, Annie Smith, and Betsy Dobbins, Ph.D.

Introduction:

- Alabama has abundant ground water that could infinitely sustain its inhabitants if maintained properly.
- Nitrates, phosphates and unauthorized hazardous wastes emptied from Concentrated Animal Feeding Operations (CAFOs) enter creeks, rivers, and oceans through improper filtration and surface runoff (EPA, 2016a).
- Nitrates are necessary for life. However, an overabundance of nitrates creates hypoxic conditions that threaten aquatic ecosystems (Chrislock, Doster, & Zitomer, 2013).
- Excess phosphate in water can cause eutrophication that results in harmful algal blooms.
- Algal blooms create ecological dead zones and toxins that harm people who are exposed to these waters or who consume the fish or shellfish from them (EPA, 2015).
- Alabama is the third largest poultry producer in the United States (Castleberry, 2014).
- From 2014-2015 a chicken processing plant in Blount County, AL released greater than two million pounds of nitrates into a nearby wetland (EPA, 2016b).
- Despite knowledge about CAFOs, less is known of the effects of animal processing facilities on adjacent water systems.

Hypothesis:

We predicted that Graves Creek downstream from a wetland that filters runoff from a settling pond associated with a chicken processing plant would contain:

- **higher concentrations of nitrates and phosphates than upstream**
- **decreased concentration of nutrients compared to the concentrations in the settling ponds**
- **higher conductivity downstream of the wetland discharge due to increased nitrates and phosphates.**
- **lower dissolved oxygen levels due to eutrophication from excess phosphates**
- **Higher pH levels**

Methods:

- Graves Creek is located in the Locust Fork Watershed of the Black Warrior River in Northern Alabama (Fig. 1A).
- Samples were collected in Feb, April, and August of 2015 and September, October, and November of 2016.
- Two samples were collected from each of 8 sites (Fig. 1 B).
- Samples were collected in acid washed, 250 mL plastic or glass bottles. At each sample site, we measured the conductivity (HACH HQ14D), and pH and dissolved oxygen (HQ 40D). Samples were refrigerated (4 °C), then rewarmed (22 °C) to test for the presence of phosphates and nitrates using a Colorimeter (DR/890, HACH) and proprietary methods [phosphates (PhosVer 3 Phosphate Reagent, HACH), and nitrates (NitraVer X Test 'N Tube nitrate reagent, HACH)].
- Differences in mean conductivity, nitrates, phosphates, pH and dissolved oxygen at different sites were compared by Analysis of Variance (ANOVA, SPSS). Results were considered significant at $\alpha < 0.05$.

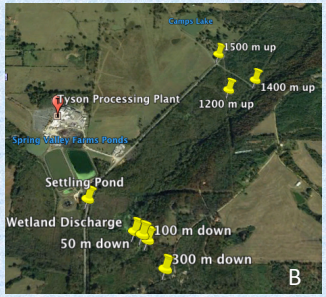

Figure 1. Location of sampling sites. A. Map of Alabama with Black Warrior River Basin outlined in green. Sampling site on Graves Creek boxed in red. B. Local map of sampling sites on Graves Creek in relation to the chicken processing plant.

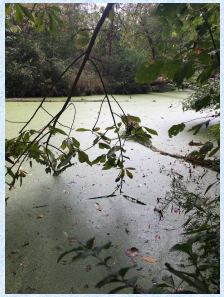

Figure 2. Excessive growth of duckweed 100 m downstream of the wetland discharge.

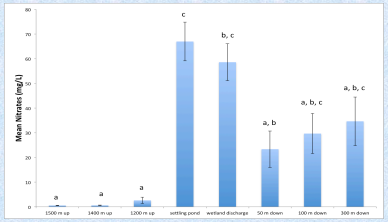

Figure 3. Mean nitrates in locations on Graves Creek upstream (up) and downstream (down) of a chicken processing plant. Site 50m downstream has a freshwater source. Error bars represent standard error. Letters represent statistically homogenous subsets ($p < 0.05$).

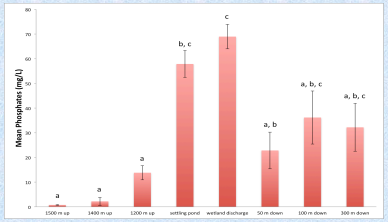

Figure 4. Mean phosphates in locations on Graves Creek upstream (up) and downstream (down) of a chicken processing plant. Site 50m downstream has a freshwater source. Error bars represent standard error. Letters represent statistically homogenous subsets ($p < 0.05$).

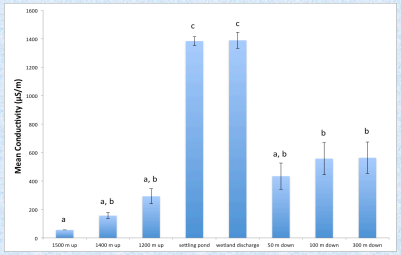

Figure 5. Mean conductivity in locations on Graves Creek upstream (up) and downstream (down) of a chicken processing plant. Site 50m downstream has a freshwater source. Error bars represent standard error. Letters represent statistically homogenous subsets ($p < 0.05$).

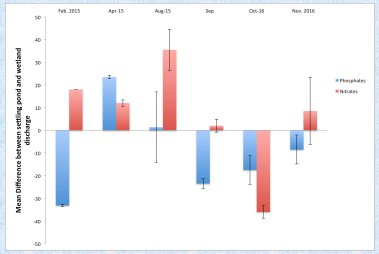

Figure 6. Mean difference between the concentrations of nitrates and phosphates in the settling pond (entry point from processing plant) and the wetland discharge across seasons. Error bars represent standard error.

Results:

- Excessive duckweed growth was observed 100 m downstream of the wetland discharge (Figure 2).
- Both mean phosphate ($F_{7, 94} = 11.174$, $p < .001$) and mean nitrate ($F_{7,81} = 8.870$, $p < .001$) concentrations were significantly higher in sites downstream of the wetland discharge compared to upstream (Figure 3 and 4 respectively).
- Mean conductivity downstream of the wetland discharge was significantly greater than upstream ($F_{7, 116} = 39.875$, $p < .001$) (Figure 5).
- There were no significant differences in mean pH ($p = .091$) or D.O. ($p = .218$) upstream and downstream of the wetland discharge.

Results (cont):

- The mean difference between the settling pond and the wetland discharge with respect to phosphates varied by season. Higher concentrations of phosphate were seen in the wetland discharge in February, September, October, and November (Figure 6).
- In November 2016, we observed a new wetland discharge point entering Graves Creek directly upstream of the original wetland discharge.
- Fewer samples were taken from the 1500m and 1400m upstream sites due to a drought in 2016.

Discussion:

- As hypothesized, nitrate and phosphate were higher downstream of the discharge from a wetland associated with a Chicken processing plant.
- We expected to find lower DO concentrations and higher pH downstream of the discharge, but found no significant differences. Seasonal variation may have ameliorated the DO swings associated with hot weather. We recommend further focus on seasonal differences in this critical parameter.
- Single samples of nitrates in Graves Creek exceeded the allowable maximum contaminant level (MCL). Samples from upstream of the wetland discharge and local farm properties did not exceed 1/10 of the MCL. This suggests that the processing plant is altering the chemical stability of Graves Creek.
- The typical concentration of nitrates in surface water is less than 1.0 mg/L (EPA, 1997), however our results were an order of magnitude greater, suggesting impaired waters.
- The concentration of phosphorus from the wetland exceeded ADEM water quality criteria (AL 335-6-10) for aquatic life ($\leq$ 1.0 mg/L).
- The wetland followed a seasonal pattern of absorbing nutrients, particularly nitrates, and there was a demonstrable nutrient release to Graves Creek.
- Concentration of nitrates and phosphates in Graves Creek were higher in 2016 because Blount County received < 0.41 in. of rain within the duration of our study compared to the average 12.2 in. Blount County receives from September to November (U.S. Climate Data, 2016).
- The current monitoring of nutrient discharge into surface water is insufficient to maintain nutrient concentrations that are safe for human and ecological health. Therefore, we suggest nutrient releases be more strictly monitored and controlled, particularly during seasons of drought.

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Impacts of a chicken processing plant on water quality and bacteria concentrations in an adjacent wetland and creek.

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Introduction

Meat processing plants cause significant environmental stresses that are not well understood (Bawa et. al 2012). Poultry processing wastewater (PPW) contains a variety of constituents including particulates, organics, and nutrients from uncollected blood, feathers, and eviscerations from a slaughter plant (Kiepper and Plumber 2011). Raw PPW is primarily treated to create an effluent that can be discharged indirectly into city sewers or directly into waterways if it meets regulations (Kiepper 2003). The Blount Co. Tyson chicken processing plant disposes effluent directly into surface waters despite its proximity to agricultural, residential, and recreational sites. The Alabama Department of Environmental Management (ADEM, 2012) regulates organic enrichment and coliform bacteria (AL0001449).

The purpose of this study was to evaluate the effects of effluent discharge of PPW on the adjacent wetland and creek system. Effluent contamination could have an impact on water quality and fecal indicator bacteria (FIB). The correlation between FIB and sources relies on assumptions of local contamination, but microbial source tracking (MST) can attribute elevated FIB levels to a particular source. Bacterial tracking with MST can effectively evaluate a wide variety of host sources (Korajkic et. al 2013). We hypothesized that the Tyson chicken processing plant effluent discharge was affecting water quality in the adjacent wetland and Graves Creek. We expected to find elevated conductivity and *E. coli* concentrations but decreased concentrations of dissolved oxygen (DO) and pH. We predicted that bacterial contamination could be attributed to Chicken fecal bacteria based on MST with the genus *Bacteroides*.

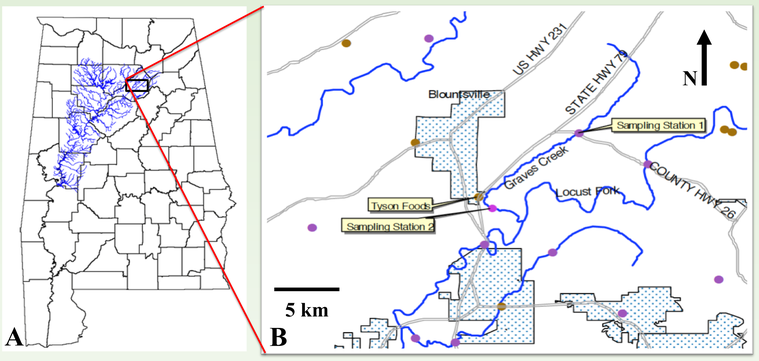

Fig 1. Map of location of sampling site in A. Black Warrior River Watershed of Northern Alabama (http://aaes.auburn.edu/wrc/resource/rivers-of-alabama/black-warrior-basin/) and in B. Expanded view of Graves Creek (ADEM, 2002).

Materials and Methods

- Graves Creek, in the Locust Fork of the Black Warrior River in North Alabama (Fig 1A), receives input from a wetland that filters PPW.
- During 2017 and early 2018 we collected sets of water samples (1 from surface water and 1 from the mud-water interface) at 6 sites in Graves Creek and adjacent wetland (Fig 1B).
- Conductivity (HACH HQ14D), Dissolved Oxygen (DO) and pH (HACH HQ40D) were recorded at each sample site.
- Water was collected in acid-washed Nalgene bottles, iced, and stored at 4 °C.
- E. Coli concentrations were determined by Coliscan MF (Micrology).
- Within 2 weeks of collection, filtration (Thermo Scientific Nalgene Rapid-Flow 75 mm, 1 liter) and DNA extraction (DNeasy PowerWater Kit 50) were performed.. Samples from mud-water interface were pre-filtered (Whatman 1).
- DNA concentrations were established (NanoDrop LITE Spectrophotometer) for PCR.
- Microbial Source tracking involved PCR (SimpliAmp Thermal Cycler, 40 cycles, annealing temperature of 62.7 ° C) using *Bacteroides* 16S rRNA primers (Table 1)
- Presence of *Bacteroides* was verified by electrophoresis (E-gel iBase, Invitrogen 2% and 4% agarose E-Gel Ex with SYBR Gold) with a Quick-load purple 100 bp DNA ladder.
- We compared mean water quality and *E. coli* between sample sites with ANOVA (SPSS). Differences were considered significant at an $\alpha = 0.05$.

Table 1. *Bacteroides* primers

Host	Primer identifier	Base pairs	Citation
Universal	BacUni-520F BacUni-690R	170	(Kildaire, 2007)
Chicken	ChBact F1 ChBact R16	532	(Cisar, 2010)
Cattle	BacCow-UCD F BacCow-UCD R	177	(Ahmed, 2013)
Human	HF183F HF183BacR287	126	(Ahmed, 2013) (Green, 2014)

Results

WATER QUALITY

- There were no significant differences in pH between any sample site ($P = 0.061$).
- Conductivity was significantly elevated in the wetland compared to all other sites ($F_{5,95} = 126.893$, $P < 0.0005$) (Fig. 2A).
- Concentrations of DO were significantly reduced in the wetland and adjacent Creek compared to upstream and downstream ($F_{5,84} = 2.496$, $P < 0.038$) (Fig. 2B). Although there was a strong relationship between temperature and DO ($R^2 = 0.542$, $F=101.515$, $P < 0.0005$), all of the DO readings less than 6 mg/L occurred in the wetland (Fig. 3).

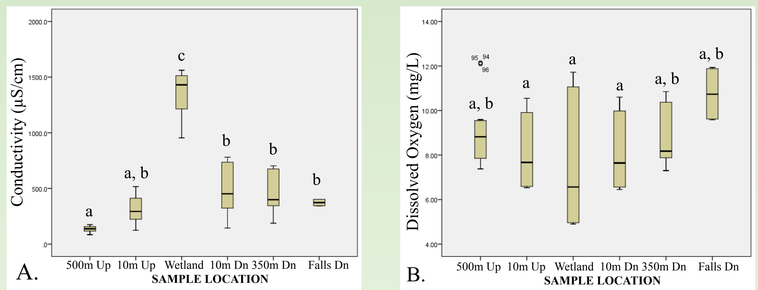

Fig. 2. Water Quality Graves Creek and Wetland. A. Conductivity and B. Dissolved Oxygen. Samples sites organized from upstream to downstream. Letters indicate statistically different groups. All outliers were from the coldest day.

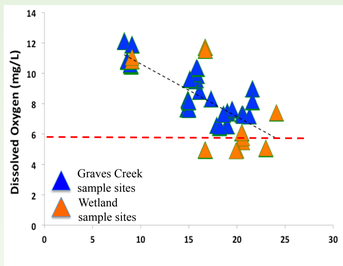

Fig. 3 The effect of temperature upon DO. Red line indicates minimum DO allowed by discharge permit (ADEM, 2012).

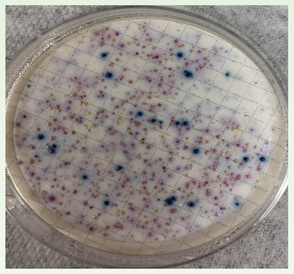

Fig. 4 Bacteria from wetland sample. Blue colonies indicate *E. coli* and purple colonies indicate coliforms.

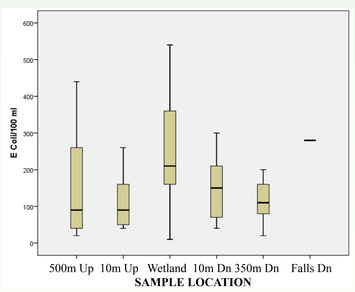

Fig. 5 *E. coli* Graves Creek and Wetland.

BACTERIA

Every wetland sample contained *E. coli* (Fig 4). There was a significant difference in *E. coli* colonies/100 mL between sample sites ($F_{5,72} = 98.641$, $P<.009$). Although post hoc testing could not discriminate sample sites there was a trend toward increasing *E. coli* in wetland and falls sites (Fig 5).

MICROBIAL SOURCE TRACKING

There was no evidence of DNA from human or cattle *Bacteroides* using relevant primers (Table 1), but a prominent band (537 bp) indicated chicken *Bacteroides* using the relevant primer (Fig. 6A) in water from Graves Creek downstream of the wetland. The prominent (chicken-associated) band was seen in wetland and downstream samples but not in upstream or negative control samples (Fig. 6B).

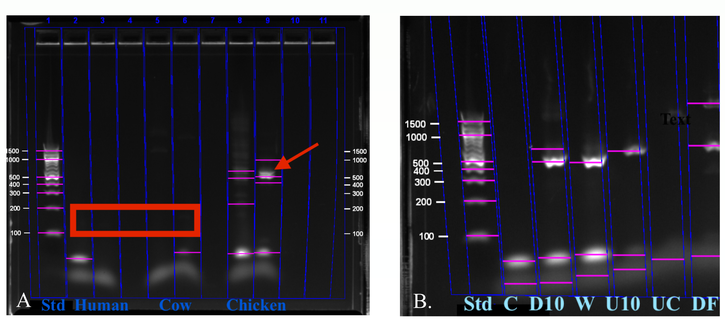

Fig. 6 Gel electrophoresis demonstration of DNA associated with *Bacteroides* primers. A. Indication of DNA human, cattle, and chicken *Bacteroides*. Box indicates region of expected human and cattle *Bacteroides* DNA . Red arrow indicates chicken *Bacteroides* band. B. Chicken Bacteriodes bands from water across sample sites.

Conclusions

- As hypothesized, the results show that the Tyson chicken processing plant effluent discharge affects water quality and purity in the adjacent wetland and Graves Creek.
- Tyson processing is listed as a significant source of impairment for Graves Creek watershed (ADEM, 2002).
- The significant conductivity elevation in the wetland is indicative of bacterial contamination (Dufour et al. 2003).
- Lower dissolved oxygen readings around the wetland and adjacent creek are most likely due to eutrophication and bacterial contamination from the plant. Oxygen depletion can have negative impacts on aquatic ecosystems.
- All the DO readings below 6.0 mg/L (the ADEM limit for lowest DO allowed by Tyson's permit) occurred in the wetland. Low DO stresses aquatic life and could contribute to impairment of the wetland and the adjacent creek. Graves Creek is impaired by low DO, and there is a TMDL to ameliorate the problem (ADEM, 2002). There needs to be better monitoring of and adherence to the TMDL.
- The differences in *E. coli* concentration between sample sites can be attributed to effluent from the Tyson processing plant. It is likely that sample groups were not divided into statistical subsets because the *E. coli* concentrations varied throughout the year.
- Microbial source tracking indicated that fecal contamination was derived from chickens. The lack of any human or cow fecal contamination supports the hypothesis that Tyson processing effluent is responsible for water quality and purity effects. These combined results indicate that poultry effluent has negative impacts on waterways.
- ADEM allows Tyson's chicken to discharge *E coli* up to 487 colonies/100 ml in summer months (June –Sept) and up to 2,507 colonies/100 ml in the rest of the year (ADEM, 2012). Our data indicates that there are often more than 487 colonies/100 ml in the water discharging from the wetland.
- The fact that there is a popular swimming area (Mardi Mill Falls) less than 500 m below the place where contaminated water from the wetland enters Graves Creek is a source of serious concern.

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