



IN REPLY REFER TO:

United States Department of the Interior  
NATIONAL PARK SERVICE

Buffalo National River  
402 N. Walnut, Suite 136  
Harrison, AR 72601

I.A.1

March 15, 2017

Becky Keogh  
Director  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
Little Rock, AR 72118-5317

Comments Submitted Electronically: [Water-Draft-Permit-Comment@adeq.state.ar.us](mailto:Water-Draft-Permit-Comment@adeq.state.ar.us)

Dear Director Keogh:

Buffalo National River (BNR) is a congressionally-designated unit of the National Park System (System), pursuant to the Buffalo River Enabling Act of 1972 (P.L. 92-237). It was added to the System in recognition of its free-flowing condition, scenic and scientific values, and for the recognized recreational and fish and wildlife values the river provides. The National Park Service is charged to protect the values of the BNR for the benefit and enjoyment of present and future generations in accordance with Federal law.

The NPS has reviewed the draft permit 5264-W, for C&H Hog Farms, Inc. to store and land apply liquid swine manure within the Buffalo River Watershed in accordance with APC&EC Regulation 5. While the proposed permit is located outside of the boundaries of the BNR, its relative proximity to the river and a demonstrated hydrologic connection, associated with the local karst environment, present a high risk of contamination to the river and adverse effects to the values for which the BNR was established. Please consider the following comments as you make a final permit decision.

**General Comments:**

- The NPS remains concerned about the impacts from the operation of C&H on the waters of Big Creek and the Buffalo River, especially as it pertains to the inevitable introduction of nutrients into groundwater and surface waters that are critically important to the continued well-being of the river and the health and safety of those who enjoy in its recreational values.

- Because of its high social, resource, and economic value, the waters of the Buffalo River, an Outstanding National Resource Water (ONRW), Extraordinary Resource Water (ERW), and Natural and Scenic Waterway (NSW), and the karst setting of the Buffalo River, the current location of the concentrated animal feeding (CAFO) operation is not suitable for the establishment of high volume liquid animal waste storage under an NPDES (Regulation 6) or State non-discharge permit (Regulation 5). Karst conditions and insufficient areas to land apply manure persist.
- The NPS appreciates the addition of special conditions to the Regulation 5 permit, such as the watershed-specific regulations for the BNR. In the event the CAFO operation is permitted under Regulation 5, all stipulations under the watershed-specific regulations should be applied retroactively so that the BNR, its values and its users may benefit from the added environmental safeguards immediately.
- Many sections have subjective wording (i.e. “reasonable time”). It would be important to establish clear direction with a “not-to-exceed” statement, for example, for conveying concise permit requirements and information.

### **Specific Comments:**

#### **1. RE: Part I Monitoring Requirements**

Table I details the monitoring frequencies and the reporting results to ADEQ for each respective parameter listed in the table heading (Waste Analysis, Soils, and Interceptor Trenches). Groundwater/underground water is considered “Waters of the State” susceptible to contamination from this facility. However, multiple levels of perched groundwater beneath the soil layer in addition to the regional water table are potentially impacted by a release from leakage of the waste lagoons. Monitoring of shallow perched groundwater in soils using the interceptor trenches is insufficient to identify a release to the several potentially discrete groundwater occurrences/flow pathways beneath the soil layer from this facility (e.g. in the epi-karst, at the top of competent bedrock) or deeper groundwater (water table) in the competent bedrock. A Table IV should be added and include monitoring from at least one down gradient borehole with nested monitoring wells isolating the epi-karst interval and the regional water table interval. Monitoring of springs down-gradient of the waste storage ponds is also highly recommended. Springs integrate some of the heterogenous flow paths of shallow groundwater and the water table portion of the groundwater, and are therefore an excellent sampling location for pollutants.

The potential for leakage to occur beneath the shallow soil interval targeted through the monitoring of downslope soils with interceptor trenches is apparent from geophysical studies and the possibility of perched water intervals given the heterogeneities of site

stratigraphy observed in the Drilling Study conducted near the waste ponds. Furthermore, the depth reached by the ponds indicates the epi-karst interval was likely reached should leakage occur out the bottom of the ponds. Monitoring wells should include the same parameters as the Interceptor Trenches and their sampling frequency should be yearly. Additionally, further justification of monitoring variables and frequencies is needed in Tables I-III.

In Table I, addressing waste concentrations, it is unclear why soluble nitrogen variables or indicator bacteria are not considered as they are in Table III, addressing interceptor trenches. Both of these variables have implications for land application decisions. Regarding sampling frequency, monitoring waste once per year seems insufficient to account for seasonal variability and nutrient cycling within the waste ponds, making it difficult to estimate P and N application rates and effectively plan land applications. Similarly, monitoring soils once per five years seems insufficient, as fields will be undergoing land applications and assimilating N and P over that period. Permit language associated with monitoring should also stipulate appropriate Quality Assurance/Quality Control methods and ensure that analytical and sampling approaches are compatible over time so as to be able to track changes over time. Overall, the monitoring requirements seem insufficient to adequately plan land applications, assess soil nutrient conditions and permit compliance, or address potential leakage. It is imperative that ADEQ establish appropriate monitoring to address potential pathways of exposure and ensure that if monitoring results exceed a stipulated trigger, series of stipulated actions are implemented that would safeguard the watershed. Thus, permit language should include triggers for action on behalf of the permittee and ADEQ. Water quality criteria would seem an appropriate trigger for action and at no time should a no discharge permit result in violations to water quality.

## **2. RE: Part II Specific Conditions - Specific Condition #2, #4, #7, & #8**

Condition #2, states that "Waste shall not be discharged from this operation to the Waters of the State or onto the land in any manner that may result in ponding or runoff to the Water of the State." Waste will be applied during spring for most years while being stored overwinter; this also corresponds with spring rain events which will cause overland flow in the application fields. The permit should stipulate what measures will be put in place to ensure that waste will not reach Waters of the State in an unpredictable environment. According to Condition #15, waste cannot be applied when the soil is saturated; frozen or covered in ice or snow; when significant precipitation (this is subjective and needs clarification, see Part II Condition #15 below) is reasonably anticipated in the next 24 hours; or during a precipitation event (also needs to be defined, see Part II Condition #15 below). These conditions, in conjunction with Condition #14,

greatly reduce the effectiveness of application (increased need to apply waste on fields that dry faster during peak periods of application need), especially during wet seasons, since most application fields are located near streams (i.e. Waters of the State).

Condition #4, which states that the existing Nutrient Management Plan (NMP) is hereby incorporated into the new permit, seems unnecessarily vague and rushed, as it also includes language suggesting the NMP may be inconsistent with the new permit and require future revision. It would seem that thorough review of the existing NMP is essential prior to issuance of the new permit. For example, the permittee should establish that past compliance with the Nutrient Management Plan and its June 2016 Addendum in the 3 years of the facilities operation, has not led to conditions in the application fields which exceed the new requirements under Regulation #5 for application fields to meet Low to Medium nutrient classes (phosphorous levels in accordance with the Arkansas Phosphorus Index). If existing spreading fields after 3 years of application no longer meet the Low to Medium phosphorous API requirement, then it would appear that the new fields would likely not meet that requirement in the future and the current field management practices are set up to fail the enforceable conditions of this permit.

It is our understanding that the NMP is also based on a 24 hr/25 year storm event standard. This approach may be appropriate generically within the U.S., but we question whether this is appropriate for Arkansas where flood conditions may be more frequent than those for which this generic standard was established. If ADEQ has knowledge of the inadequacy of this standard, it should establish an updated standard and apply that standard to this permit so as to not result in violations to water quality standards.

Additionally, Condition #8 states that waste applications “must not exceed the recommended nitrogen application rate,” but does not provide this rate or a reference. Please stipulate this rate within the permit. Further, it is not clear how the proposed monitoring (TN in the waste ponds versus nitrates in the soils) would enable the permittee to comply with this condition. More attention to nitrogen is warranted given recent changes in nitrogen concentrations and nuisance algal growth within the Buffalo River. Additionally, this condition seems to contradict Condition #14, which states that waste should be evenly distributed over application sites. As fields are removed due to high API values, remaining fields will be utilized to apply waste. This will further exacerbate the problem noted at the end of first paragraph in Condition #4 above. Please provide a contingency for addressing waste application as API values prohibit use on some fields so as to avoid exceedances or result in undue pressure on specific areas. This type of contingency would best be described within the revised NMP.

The table in Condition #7, showing proposed land application fields, should be updated to include API class and nitrogen status based on up-to-date soil monitoring data. Any

fields not meeting these conditions should be removed from consideration prior to permit issuance and the application acreage recalculated accordingly.

### **3. Part II Specific Condition – Specific Condition #13**

Previous waste lagoon leakage deemed in accordance with the NRCS Field Office Technical Guide for compacted clay liners appears incompatible with karst geologic conditions and the new permit requirements of “no discharge” to “waters of the State” that include groundwater. A synthetic liner should be required for waste lagoons in this particular situation given the greater risk to downgradient and downstream resources from this particular facility given the amount of waste generated from the size of the facility, the karst geology present, the high potential rate of groundwater flow under fractured limestone bedrock conditions with associated limited potential for contaminant assimilation or reduction and despite possible regulatory concerns of precedent setting for such a requirement.

There is no stipulation within the conditions relative to the impoundment size. A limitation should be designated so as to limit potential for releases during storm events or through other impoundment failure. Please stipulate the maximum storage capacity of waste in any impoundment to reflect sufficient buffering to avoid overflow during storm events (see Comment 12, Part 8)

### **4. Part II Specific Condition – Specific Condition #15**

“Significant” precipitation (e.g. ¼ in.) should be specified for the 24-hour period along with the nearest local weather station referenced that provides 24-hour precipitation forecasts. Without such specificity, this permit condition would appear arbitrary and have little enforcement basis. Please also define “saturated” so as to clearly communicate appropriate conditions for land application.

### **5. Part II Specific Conditions – Specific Condition #16, #17 & #18**

These land application buffer and boundary conditions including those for slopes with a grade greater than 15%, setbacks from buildings, property lines and streams, appear to require at least some initial effort to flag or mark in some manner these features and their boundaries to ensure these application conditions are met and enforcement is a reasonable option. However there is no mention of marking such boundaries or their initial documentation on maps or in imagery of any kind to allow for their future unambiguous implementation. This would seem to leave their enforcement to highly arbitrary subsequent interpretations of the operations manager and the regulator should third party disputes arise.

We advise that ADEQ strongly consider limiting application of waste on lands identified as karst areas and evaluate each of the proposed land applications sites for this sensitivity. Please include the word “karst areas” within the list of limitations stipulated in Condition #17.

**6. Part II Specific Conditions – Specific Condition #21**

This condition states that waste can be “shipped” to other locations. “Shipping” does not seem to have the correct meaning in this context. Consider changing word to hauling or trucking waste. Given this option, a spill response plan should be in place prior to initiating this type of action so as to have appropriate procedures in place in case of accident and spillage of waste into Waters of the State.

**7. Part II Specific Conditions – Specific Condition #24**

This condition notes that the NMP “shall be reviewed annually by the operator.” Given the high profile of this operation, the potential for changes in soil nutrient status at application fields over time, and the potential for impacts to high quality waters of the state, it would seem appropriate for both the operator and ADEQ to review the NMP annually.

**8. Part II Specific Conditions – Specific Condition #25**

This specific condition should specify what levees are being referred to. Although the assumption may be the levees surrounding the waste lagoons (not mentioned previously in the permit), levee is a general term associated with a number of features on the landscape that may be either natural (e.g. stream) or manmade. Annual inspections seem too infrequent given the potential for severe weather and dependent on the construction of the levees themselves. Please provide a more detailed inspection plan for incorporation within this permit that addresses frequencies, and intensity of inspection (i.e. by a structural engineer).

**9. Part II Specific Conditions – Specific Condition #26**

As noted above, monitoring frequency for all variables in Tables I-III seems insufficient. The provision in Condition #26 for reducing monitoring frequency in the interceptor trenches from quarterly to once per year is similarly concerning, particularly since conditions may change during replacement of the pond liners. This reduction in monitoring stipulated within Condition 26 should be removed. It is incumbent on the permittee to ensure they do not violate water quality standards and limiting or removing monitoring reduces ADEQ’s ability to detect a violation and remedy any issues.

Additionally, monitoring for chronic loading requires decades of sampling to adequately characterize the issue. It is not reasonable to believe that a fixed (5 year) time frame will assess the effects of long-term, continued application of liquid waste.<sup>1</sup>

#### **10. Part II Specific Conditions – Specific Condition #28**

There is no requirement for a synthetic liner with geotextile base material but instead only an acknowledgement that the permittee is “authorized” (presumably at the permittee’s discretion?) to construct and operate such base material in Waste Storage Ponds 1 and 2 “provided the work is commenced within 24 months from the effective date of this permit.” While a synthetic liner “requirement” may be precedent-setting for such facilities under Regulation 5 and the basis for not making a synthetic liner a requirement in this permit, the scale of this operation in terms of waste generation and the potential downstream resource impacts from a waste lagoon release should drive the regulator to look for a means to “require” a synthetic liner installation by making it subject to site conditions (e.g. underlain by karst geology, upstream from waters subject to water quality special protection, and/or ecological & resource significance). Past liner designs (compacted clay) under the General Permit referencing the NRCS Field Office Technical Guide acknowledges and allows for significant leakage (5,000 gallons per day per acre of pond) that could affect and degrade waters found “underground” or Waters of the State. In the absence of a specifically required synthetic liner, it appears incompatible with the “no discharge” basis under Regulation 5 of the new permit. Given site and area-specific conditions of the facility, the state should ensure that all waste lagoon design measures are taken to minimize leakage to the environment and “Waters of the State” and this may only be accomplished through installing the least permeable bottom and side liner for the waste lagoons. If the “permit modification approved by the Department on March 25, 2016” includes the installation of a synthetic liner at the permittee’s waste ponds, it should be indicated in this permit so that stakeholders can understand this is a contingency for issuance of this permit under Regulation 5. It also seems reasonable to require a synthetic liner installation ideally prior to but certainly within 12 months of any permit issuance.

Additionally, if an impermeable liner on the ponds is installed and allowable leakage is currently occurring through the compacted earth liner, pond volumes may increase even with the same amount of influent. This may necessitate more frequent pump-out for land application, which in turn could lead to field saturation of certain nutrients more quickly.

---

<sup>1</sup> Sanford and Pope (2013) noted that groundwater recharge can take years to decades to cycle through ground conduits. Citation: Sanford, Ward E. and Jason P. Pope. 2013. Environmental Science and Technology, 47, 13330-13338.

### **11. Part III Standard Conditions – Standard Condition #11**

The condition language needs to be revised to show that any discharge will be a violation given this is a no discharge permit. Given the title of this Condition, it would seem appropriate to include a narrative of mitigations that would be expected of the applicant should an inadvertent discharge occur.

### **12. Part III Standard Conditions – Standard Condition #12**

Solids removed from the ponds do not have any requirements for testing for phosphorus or nitrogen. Solids typically have high levels of these nutrients and before being applied on application fields, samples should be collected to determine their impact on applied fields. This process would seem appropriate to incorporate within the larger revised NMP. It would also seem prudent to define how wastes may be discarded in compliance with Arkansas law and regulation.

### **13. Part III Standard Conditions – Standard Condition #13 Reporting of Violations and Unauthorized Discharges, Paragraph A and B**

#### **Paragraph A**

It is difficult to determine what would constitute a violation of this permit. The permit lacks performance criteria (such as monitoring triggers for action in violating water quality; definitions defining application conditions; and limits for holding waste). The permit needs these guidelines to provide sufficient direction to the applicant to safeguard water quality and protect human health.

Please state what constitutes a reportable discharge volume. If it is of any amount, then stipulate it as such.

#### **Paragraph B**

Because levee has been used previously in previous sections discussing specific conditions under this permit, presumably in referring to the structures around the ponds to increase freeboard and limit risk of waste overflow of the lagoons, “levee” should be added here along with “dike” to properly identify this structure related to some potential structural failure associated with the lagoons that require reporting. It also appears that the monitoring requirements for this site (Part I) ignore groundwater flow paths via the epi-karst (perched groundwater beneath the shallow soil layer or at the top of bedrock) and at the depth of the regional groundwater table (80 or more feet below surface in fractured competent bedrock) based on the Drilling Study performed at the site. A single downgradient borehole located near the base of slope with nested monitoring intervals (wells) in these intervals (within any epi-karst potential water bearing zones and at the regional water table) would go a long way in ensuring the risk of impacts to waters of the



state from this facility are minimized with minimal added expense. This should be a contingency of this permit issuance.

#### **14. Part III Standard Conditions – Standard condition #16 Retention of Records**

Given the sensitivity of this site and the need to ensure baseline conditions for groundwater are retained for reference should future questions of groundwater contamination arise, and given the highly variable rate of flow of groundwater in certain situations (vertically and horizontally via porous media or fracture flow), the 3 year record retention requirement seems inadequate to ensure historically significant data is not lost. Including more specific records retention requirements in Specific Conditions #20-22 would help clarify this.

#### **15. Part IV Definitions – “Waters of the State”**

Unless the “Waters of the State” definition is taken directly from statute that did not include the term “groundwater,” it is recommended the more commonly used term “groundwater” would best cover the all-encompassing occurrence of water below the land surface that the State appears to want to regulate under Regulation 5 to achieve a “no discharge” condition. This would add clarity and better ensure the protection of both surface and groundwater resources of the State if incorporated in this definition.

#### **16. Statement of Basis, Part 5. Waterbody Evaluation**

The use of the 2008 ADEQ 303(d) does not consider or include the best available data for evaluation of waterbodies surrounding the permit location. While we understand this is the most recent EPA approved list, many changes have occurred since its approval nine years ago. It would seem reasonable to consider the recent 2016 assessment. NPS has provided ADEQ information on two sections of Big Creek where E. coli exceedances and low dissolved oxygen levels have been observed. Dissolved oxygen data collected by USGS recently also noted issues within that reach of the stream and should be considered.

#### **17. Statement of Basis, Part 7.**

The original general permit called for a maximum of around 6,500 hogs to be housed on site. This section indicated the total number of animals at 3,428. We are just confirming that this number is correct and that it is or is not inclusive of pigs that are post-weaned.

#### **18. Statement of Basis, Part 9**

It is not clear how an irrigation system would be able to target specific fields and be compartmentalized to avoid applying to fields that are no longer viable or avoid sensitive resources. Irrigation systems would also require additional monitoring to ensure

appropriate uptake by fields to avoid runoff. We suggest not permitting this element of field application without additional language to safeguard resources and stipulate limitation of use.

#### **19. Statement of Basis, Part 8. Waste Storage/Treatment Components**

The current storage provisions for the ponds – a one-foot free board and storage to accommodate a 24-hour, 25-year storm event – seem insufficient to ensure that ponds do not overflow during extreme precipitation events. Such events are predicted to become more common in Arkansas and elsewhere. Perhaps an additional storage buffer could be added during pond liner replacement, to better account for climate change-driven increases in overall precipitation and frequency of intense storm events. Historically, waste pond overflows from such facilities are recognized as one of the more common situations leading to offsite migration of contaminant fluids so they should be better designed (increased freeboards) to minimize and avoid when possible this eventuality.

#### **20. Statement of Basis. Part 11. Total Available Acreage**

We suggest that the total acreage available for land application be recalculated once fields having high or very high API values are removed. Additionally, this section does not look any farther than the date of this document to account for fields being removed or added over time. Adequate acreage exists to land apply today; however, after a few years will all current fields meet the API requirements? As fields become saturated, what will be the course of action to ensure protection of resources? Again this seems an appropriate topic to address within the NMP revisions. The NMP revisions should be incorporated as a primary requirement of this permit before it is issued.

Although we welcome the move to a more site-specific permit for this facility, we are concerned about the decision to issue a *no-discharge* permit given that widespread land-based applications are planned. Diffuse discharges of nutrients and bacteria to waters of the state seem likely. Existing nutrient management planning appears inadequate to prevent transport to surface water and leaching to groundwater (see above) and proposed monitoring is not sufficient to detect and attribute impacts (also above). If a no-discharge permit is to be issued, it should be implemented in earnest, which would require updates and improvements to the nutrient management plan as well as an expanded monitoring effort that 1) accounts for the area's complex karst geology and gaining/losing hydrology; and 2) is equipped to detect changes in nutrients and bacteria and attribute them to the source.

The NPS has a continuing interest in working with you to ensure that there are no impacts to the Buffalo River, a resource of great concern to the NPS. The Buffalo River is a national treasure and the nation's first National River. It is of mutual benefit that BNR receive the utmost

consideration and permanent protection from activities known to threaten this exceptional water resource. Should you have any questions, please contact me at [BUFF\\_Superintendent@nps.gov](mailto:BUFF_Superintendent@nps.gov), or 870-365-2732.

Sincerely,



Kevin G. Cheri  
Superintendent