

Work Plan

When I first read about the “Rainy Day Fund Deal”, I had assumed the Buffalo Creek Research and Extension Team (BCRET) group was planning a water quality monitoring program with the goals of protecting (or at least early warning if something goes wrong) the Buffalo River from possible impacts of untreated hog waste. It appears from the title of their workplan “**DEMONSTRATING AND MONITORING THE SUSTAINABLE MANAGEMENT OF NUTRIENTS ON C&H FARM IN BIG CREEK WATERSHED** ([ch_work_plan9-4_3_.pdf](#))”, that they plan to use this as a BIG “Treat, Apply, Monitor and Compare” Demonstration Project. I believe this is the **primary focus**, with the monitoring of the main fork of Big Creek originally and now the addition of a possible addition of the Left Fork of Big Creek at Vendor, a way to sell this “**sustainable**” approach (sustainable is the buzz word that that might make a Hog Factory look real green both environmentally and cash wise). Someone once said, if they can build a CAFO here, they can build one anywhere (the fear - everywhere?). I have a real problem with using this fragile twin valley as a proto-type “test ground” for many reasons even if the Buffalo River wasn’t the possible recipient of a failed design somewhere. There are health issues concerns and clean water issues that come to mind. It is like playing Russian roulette with 5 bullets in the 6-shooter revolver. Odds aren’t good, even if BCRET want us to trust all the engineers and experts and magic they have up their sleeves.

I am not going into the why in the heck did ADEQ/PC&E allowed the permit to be allowed in the first place, especially after their 1995-2000 Hog Farm study up in geological section, in the Parthenon, AR area. I don’t believe this was an accident, or someone was asleep at the wheel at the ADEQ. I don’t believe it was an accident they didn’t notify the Jasper office about this farm and General Permit coming in. I don’t believe they allow the ADEQ inspectors to do their assigned job, proper site inspection and for sure Public Complaints.

Maybe I was mistaken thinking ex-Governor Mike Bebee actually wanted to protect what he hopefully saw as a major mistake on his watch or way out. If so he would have hired and **independent** environmental engineering company backed up with EPA (truly) surprise inspections cross checks on water quality sampling. Set up a more detailed surface and ground water monitoring network and with emphasis on trying to patch-through-sustainable-(until the money is gone)-demonstration-trial-and-error science or lack of.

There are many questions in my own mind about how this funded project evolved, who were the players who came up with the Proposal or “Work Plan”. Was the Hog Factory, Farm Bureau, Pork Industry, etc. allowed to help design the work plan or was this truly under a plan put together entirely by Dr. Andrew Sharpley (I believe he was the one the Governor suggested?) and say folks like the Agricultural Extension Engineers and USGS exclusively?? I am hopeful one day this will all be made more clear to all who have similar questions but I want dig into that, hopefully others have been and will to insure that the group that wanted to be “Transparent” truly is and that they represent using good science and common sense without external input from the Farm Bureau and others who have special interest I feel.

Introduction

(From the BCRET first Quarterly Report October 1 to December 31, 2013)

“This research project will evaluate the sustainable management of nutrients from the C&H Farm operation (subsequently referred to as C&H, to include animal facilities and permitted land application fields). The study includes the following major tasks:

- 1. Monitor the fate and transport of nutrients and bacteria from land-applied swine effluent to pastures.*
- 2. Assess the impact of farming operations (effluent holding ponds and land-application of effluent) on the quality of critical water features on and surrounding the farm including springs, ephemeral streams, creeks and ground water.*
- 3. Determine the effectiveness and sustainability of alternative manure management techniques, including solid separation, which may enhance transport and export of nutrients out of the watershed.”*

Quarterly Reports

Quarterly Reports have been a slow-go for me. BCRET reports their plans, their findings and their future plans. That all looks official and one can see activity on the ground and behind computers humming away at statistical evaluation in the form of Box Charts, etc. Reading the reports actually raised more questions than they provided answers and confidence for me. Like any project this involved, it takes time to install, stabilize and to get the project up and running and they appear to have done that well. I am going to crudely make a list of things that really pop out at me as odd and maybe totally clear to others, so please realize, I am no expert, I may be somewhat biased. I have worked in these same technical areas of monitoring agricultural runoff, ground water, and surface water monitoring as well as some geophysical survey of the subsurface on several projects and over years. I have worked with many of the members of BCRET directly and indirectly and worked for UA Agriculture for probably 20 years and now retired. I may sound like a conspiracy theory person, can may be, I hope it is more of a person that is curious on how well they are protecting America's First National River with our tax dollars (not just the rain day deal money, this river is America's River, and should not be "tread on" with such ease.

Slurry Treatments and Applications to Fields

"3. Determine the effectiveness and sustainability of alternative manure management techniques, including solid separation, which may enhance transport and export of nutrients out of the watershed."

- How did this get to be part of the focus of the Governors "relief effort" (I feel this will be the main focus for the duration of the 5 years "study")? This sounds more like a masters thesis research project or say a company wanting to develop a new product line like **Rid-X Plus** instead of a septic system, they want to use the largest tributary of the Buffalo River, Big Creek as their system and see how well it works. This really bothers me.
- How much of the budget is focused on Slurry Treatment Demonstration.
- How much actual engineer and planning time, field time, travel for the Ag Extension Engineer support is paid through that money or is that all supplemented by other state salary, travel etc. and coming out of other state money. It may all be Jake, but I am curious.
- This is a wild one – is it possible some of the Calcium Carbonate used in this treatment study coming from say a local Quarry (Field 1). Does this quarry have a permit to mine, or an air quality permit – down wind (some of the time) from the Mt. Judea School, and how about a permit for the crusher and who actually owns it?
- It appears to me that this is a means of aid in solid separation, odor control and possible pathogen reduction. Folks have been putting ag lime in outhouses or to cover dead animals for decades if not centuries. It also appears they are hoping to use this as a way to mine out the Phosphorus (P) and apply it to fields that may be low in soil test P. It sounds like a win-win approach, but it may be also a way to put a positive

spin on potentially being able to treat, untreated animal waste in areas that have readily available Calcium Carbonate or Limestone.

- In ADEQ Nutrient Management Plan (NMP), there is a box to check if one uses Alum (Aluminum Sulfate I believe) in fact alum treatments at Hog Lagoons were used in the 1990s by UA researches at hog farms in the Parthenon area and I believe found to be a good way to bond the P, separate, but maybe not so cost effective or feasible at that time. Needs Fact checking, this is from memory.

I don't remember seeing a BOX to check for other additives like Calcium Carbonate and since Agriculture lime is often used on fields it may not require the need to mention in a NMP application. Is there an upper limit of applications that might be harmful, I don't know. I just don't see why waste treatment and separating solids from the liquids of a untreated Hog Waste from a Commercial Hog Factory so it may provide a way to cheaply export waste should be paid for by US and endorsed by the State Government. If it looks like and Band-Aid it probably is in my opinion. A very expensive way for us to basically subsidize even more so a single commercial farm or do research to help future commercial Factory Farms to operate in fragile areas where they are not sustainable without constant band-aids schemes. I apologize but it is hard to not get a little worked up when one thinks about this mess and how it could have been prevented especially since the state went through this kind of magic EPA Region 6 Gold Star Award -1995-2000.

Runoff Plots - Selected Fields - Much Confusion

- Most of us know that there has been real confusion from BCRET maps and Field Assignments. Mistakes happen and that is understandable but after gaining some mistrust from the public like me, I would have hoped BCRET would have asked ADEQ to go over the applied waste field assignments, ownership, signatures and setback revisions and help generate a map that shows specifically where are the application fields located, where are the test plot fields located and is this it (I know C&E Hog Farm is trying to work a deal with ADEQ to get additional acres for either some of this waste or possible expansion (when moratorium is lifted?) but I am not concerned about that at this time. I have read the QR and see how they went from the original Field 1, Field 5 and Field 12. Then there were revisions due to Field 5 was in dispute mainly because the owner didn't want them spreading on his land, they moved north to the newest Field 5 and displayed their runoff plot design with piezometers etc. The same report should the results of their 4" deep soil core grid analysis which appears to me to show a Bull's Eye of high Phosphorus values in what might be a cattle feeding, mineral block, loafing area (my guess). The Field 5A comes along and appears to have an installation ready to measure slurry applications? Field 12 was originally mapped wrong as well with a runoff plot and piezometers some of which extended south on private property. That drawing and map has been revised but they also did a 4" deep soil core grid of the area and it too has a fairly high not so Bull's Eye of Phosphorus there as well. The site looks odd since the drainage has two outlets, one in the south west and one in the north west with Big Creek running

parallel to the H-flume. I am sure they have a game plan so I can't say, except it is odd to locate in areas with high background P. To high to spread is ~300 mg/kg I believe.

- I am getting long winded on this but I do feel these treatment demonstrations is the primary focus on the resources available with water quality monitoring of above and below the farm on Big Creek going on as a way to check and maybe reassure the public they are on guard while they continue to make the "Sustainability" case.

USGS Cooperation

- How well defined is this "partnership" in task performed, cost, and most of all quality control of data provided to the public (say online gauging stations) as well as any additional data like dye trace, interceptor trench samples etc.
- Originally I didn't see USGS as big of a part of this project as they have become. Other words were some of the original task that BCRET had planned to do themselves get relayed to USGS. Like In-Situ real time water quality data, gauging station(s), dye tracing. Maybe because it required more support to get this thing up and running and sounds okay if it was truly in the budget.
- Does BCRET rely on any of this data for their surface or ground water quality needs??? If so, do they have a procedure for taking a stream water sample at say Big Creek at Mt. Judea to compare to the real time readings of the USGS station?
- Precipitation data at reporting station, does it correspond with the 3 other weather stations purchased for the study or say the station at C&H Factory?
- Who signs off on Quality Assurance of any data including precipitation that is passed on from USGS to BCRET? Is there a review of this data by BCRET and do they have a means to compare their precipitation data, grab sample, storm sample data to say the Nitrate probes, conductivity probes etc. that are located on at least one of their stations at Mt. Judea. Big Creek at Vendor has useful sensors as well and not sure if they are part of BCRET study but would like to know.
- Did the USGS staff originally install the BCRET monitoring stations at the upper end of Big Creek (south of the Valentines).
- Did they re-install the sampler and intake line in the spring 2015 after the threat of freeze had passed?

Monitoring Wells

- How many Groundwater Monitoring Wells are there and where are they located? Some of the piezometers have been see in a photo and maps but could we get an updated map of all fields and installation equipment to date. Include in next QR is fine.
- Was there plans to have monitoring wells in several locations and depths around the two lagoons that are allowed to leak **several gallons of untreated leachate** into the ground water daily? Was the two "Interceptor Trenches" a substitute or a better way to monitor the leachates?

- Was the use of the “House Well” part of the original plan or was it a way to add means to say sample at a deeper level and it was already available?
- Do you think using the house well is a proper way to monitor for potential ground water contamination? Is this well cased to 75’ below ground? Have you seen the online state record for well completion of this well? Approximately what is the depth to the top of the water column from the top of the well?
- Is the well **cased**???
- The reason I asked is I remember seeing a news story and comments by a Fto Smith, Arkansas reporter, (KFSM online statement Posted 6:52 pm, May 6, 2013, by [Allison Woods](#))

“I believe I read where a Farm Bureau Ecologist stated that any runoff “The ponds are set up so you don’t get any runoff from the surrounding areas into the lagoons the only thing that can get into the lagoons is the manure that comes out of the barns and any rainfall that falls directly on the surface of the lagoons,” said Arkansas Farm Bureau Environmental Specialist, Evan Teague. Below the farm is a water well that supplies drinking water to the hogs. That water is tested once a month for contaminants.

If there’s any kind of runoff from the lagoons or pits that hold the manure it would end up in the water well before the river, according to Teague”

- I realize this is not a statement by BCRET, but it may give readers and viewers false confidence that this site offers no health risk due to contaminated ground water due to leachates from hog lagoons or facility. There are people I have met in Mt. Judea that still use their spring and well water. People need more details as to how well the site is not only being used as a **Demonstration and Slurry Test Site**, but most importantly, as “**MONITERED SITE**”. To me this is more critical than any of the proto-type work or Slurry Runoff Field sites. You have stated that on field 5A you want to determine ground water movement and quality. Why not at the lagoons where ADEQ Engineers have stated that thousands of gallons will leak. Prove them wrong if you like, but most of all offer some of your scientific expertise to help protect the people of the area. Young and elderly peoples are especially at health risk and are counting on **how well you are doing this One Task Alone, Monitoring the waste lagoons leakage and the extent of where all the leachate is going. Thousands of gallons of waste isn’t just sitting there. I know you all are in the process of doing a water budget which I think will be useful. But if your team fails to monitor the groundwater properly at the farm site, it is your legacy along with all the folks that let this get permitted and the ex-governor for using this to suppress anxiety of some of his concerned Arkansan citizens.**

- BCRET has defined sampling procedures in detail and specific about the sample handling, preservation and how the samples were obtained, date and time and quality assurance procedures. The Method for each parameter analyzed has for the most part been made available in the QRs.
- I may have overlooked it, but could you provide us with the procedure used to take the “house well” samples. Is it a USGS procedure or what?
- If it is not an official procedure please describe how it is done. Say, pump down a well 3 volumes worth (not practical because you are using a lot of water a day and this could very well could interrupt the Hog Factory water supply and not be practical.
- If not a pump down and then sample, does your field person lower a sterile teflon bailer of ground water pump to some known level in the water column?
- If so, approximate depth and is that recorded?
- Any details on this procedure would be welcomed since it seems to be one of the ways Farm Bureau feels comfortable with as an early indicator of any ground water problems.
- How many samples do you collect? Are there duplicates and a Trip Blank? Is this also one of the samples where the “threshold” (holding time?) is 8 hours> What analytical method(s) do you ask the water quality lab? (example: Method APHA 9223 B
- Sampling interval. Every two weeks??? After a rainfall event????
- Are their plans to install any additional monitoring near the lagoons spread out in a grid like your shallow piezometers as to characterize the groundwater movement as stated is a goal in your runoff plots at Field 5A. Most modern landfills have been required to have monitoring wells to predict movement and I realize this is not a landfill and these lagoons may be getting an upgrade soon for liners but in the mean time are there plans?

Water Samples & Auto Samplers

- How long has BCRET had their Automatic Water Samplers actually taking samples?
- Please include in the following quarterly reports any updates to site layouts. It would reduce confusion if there are any additional map updates that shows say the automatic sampler function at Field 5A and Field 12. These two sites might be sampling edge-of-field runoff and maybe a separate auto sampler collecting stream samples for example.
- Field 1 appears to only be a runoff plot with a H-flume, I will probably ask this in this section as well as the next because hopefully I will get an answer that will help clear up a question I have had for to long. BCRET mentions an “**8 hour threshold**”. Is this the same thing as “**Holding Time**”?
- Who makes the decision on whether to have a sample analyzed for e. Coli or Total Coliform? (Example: Field Person, the Water Lab doing the analysis? Or who? And is this part of a procedure known by field person, Lab and anyone whom might have custody of the samples. Is this call based only on not being able to make holding times or the “8 hour threshold”

- Is this selection process always done before the samples are analyzed or can the sample data say be labeled “N.D.” or “N.S.” after analysis by the lab.
- I think I know the answer but please since the notations above appear along with footnotes like “leaked” what is the difference between the two “N.D.” or “N.S.”?
- Why does some sample sets contain all or most of the analysis results and others lack it? (Example: most of the sites have all the data except say, the culvert?)
- This is interesting: **“Collect samples after each rainfall event from the surface runoff areas and monitoring wells”**, and from monitoring wells at monthly intervals, filter on site, store on ice and ship to the AWRC Laboratory for nitrogen, phosphorus, pH, sediment, and bacteria (E. coli) analysis for one year. Was this the case. Why only after each rainfall event.
- How are the auto samplers set up, timed mode with post processing, I saw a flow activated one. I realize your H-flumes are straight forward in knowing the flow over time so a cumulative volume can be known and one can do a load calculation since most edge-of-field events are, it rains, runoff occurs and it is over. But a culvert and the surface water sites are dynamic depending on many variables. Would you describe your overall surface water quality sampling scheme. (Example: BCRET takes Grab samples bi-weekly, the auto samplers are set to trigger on a given rise in stage, rainfall or flow increase say. Do you collect a composite sample that represents total load coverage for a storm event or say individual samples that can be worked into some kind of flow weighted determination, or **does BCRET only** “collect samples after each rainfall event”.
- **Can you describe your sampling methods on all the sampling sites that use auto samplers as well as monitoring wells, interceptor trenches and especially the culvert. It would help clarify a lot.**

Water Quality Lab(s)

(I have used his lab many times over the decades and have the greatest trust in the staff and would think the data coming out hasn't been massaged or cherry picked" by others, I would hope not)

- Does BCRET use Arkansas Water Resources Center Water Quality Laboratory(AWRCQL) for water quality analysis?
- Is this a lab that is under the direction of one of the BCRET members, Brian Haggard and also part of the Division of Agriculture? <<< May not want to use this!! It is part of why didn't they use a third party to do it if they didn't want questions come up.
- Does BCRET request the following analyses: Dissolved Phosphorus (EPA 365.2), Total Phosphorus (APHA 4500-P), Ammonia (EPA 351.2), Nitrate (EPA 300.0), Total Nitrogen (APHA 4500-P)
- I know there is a difference of opinions and confidence levels concerning holding times (maybe thresholds). Some groups use 6, some 24. Do you know what AWRCQL suggested maximum holding time is? 24 hours?
- Can you tell me why BCRET uses an "8 hour threshold"? Is that the same as "holding time"?
- Is Arkansas Water Resources Center Water Quality Laboratory your primary Water Quality Analysis Lab? If for some reason the lab is closed due to holidays or not in a 24/7 mode (I don't think it is but need to fact check) do you have a secondary lab like **Environmental Services Company, Inc. of Springdale, Arkansas?** (1107 Century Avenue Springdale, AR 72762) **This is the lab that EPA used for the first surprise inspection used for the water analysis.**

Miscellaneous Questions

- This may be a repeated question but could you tell us when BCRET first started collecting samples?
- The auto sample site at the upper end of the main fork of Big Creek had been operational and then last winter the intake line was removed due to concerns of damage to the sampler by cold weather. Was the intake reconfigured at that time?
- Is the intake line suppose to be installed in a manner that will prevent an air lock or possible cross contamination of samples if more than one sample bottle is located in the collection base?
- Did USGS reinstall the intake line to the sampler at the upper end of Big Creek in the area south of the Valentines?
- Does this look like a proper installation of a water intake line for an automatic water sampler?



Automatic Water Sampler Upper End of the main fork of Big Creek.