

## **Endangered Water: History and Current Status of the Confined Animal Feed Operation (CAFO) in the Buffalo River Watershed**

by Tricia Weidling

### Background

Alice Andrews, Conservation Chair for Ozark Society, presented a video to the LWVPC at the May meeting titled **A Mighty Struggle: The War to Keep the Buffalo River Clean and Pristine**. It is a great, information-packed, 22 minute video; I highly recommend it. For anyone who hasn't seen it, the link is available on [www.ozarksociety.net](http://www.ozarksociety.net). Follow the update for A Mighty Struggle documentary link.

The documentary goes through the history of the designation of the Buffalo River as the 1<sup>st</sup> National River, how it has been managed by the National Park Service, the fact that it is one of the cleanest and healthiest rivers in the nation, and is home to 6 endangered species. It goes on to state that the Buffalo River Watershed consists of 840,000 acres, only 11% of which are in the Park's jurisdiction, and therefore the river's water quality is highly dependent on the surrounding area's land management practices.

### Enter C&H Hog CAFO

In June of 2012 the Arkansas Department of Environmental Quality (ADEQ) approved a general CAFO permit for C&H Hog Farm in Mt. Judea, Arkansas, within the Buffalo River Watershed and less than six miles from the Buffalo River itself. The permit was issued without a public announcement allowing a period of public comment. Even the park service was not notified until February 5, 2013, almost seven months later, by which time a \$3.4 million dollar construction loan had been issued and construction was underway.

In June of 2013 C&H Hog Farm became operational, housing 2,500 sows, three hogs, and with the capacity to raise 4,000 piglets at a time to the weight of approximately ten pounds. The non-discharge permit allows up to two million gallons of hog waste to be stored in two clay-lined ponds, and the clay lined ponds are allowed to leak up to 5,000 gallons of untreated hog sewage per day (1,825,000 gallons per year) into the soil through the clay liner.

C&H Hog Farm estimates that its hogs produce two million gallons of manure per year, and despite the allowed seepage (>90%) into the soil, a substantial volume of untreated manure remains to be "managed". The non-discharge permit also allows up to 5,000 gallons of untreated hog sewage per day to be sprayed on 17 surrounding fields. Many of the spray fields are adjacent to Big Creek, the 5<sup>th</sup> largest tributary flowing into the Buffalo.

### Public Outcry Leads to Studies

Upon reviewing the Environmental Assessment of the C&H permit, the Park Service found 45 deficiencies, including failure to take the karst geology<sup>1</sup> into account, the proximity to the Buffalo River, and the impact on endangered species. Widespread public concern resulted in Governor Mike Beebe allocating \$340,000 for water monitoring and soil sampling on the fields that C&H Hog Farm spreads its manure.

The State's money was assigned in a no-bid contract to the University of Arkansas' Agriculture Department, and the Ag Department designated personnel to form the Big Creek Research and Extension Team. The team has published two quarterly reports thus far (December 2013 and March 2014), which are available to the public on the University web site.

### Second Study Led by Noted Hydrologist

John Van Brahana, PhD, recently retired Emeritus Professor of Geology, and Ozark Hydrologist, has obtained permission from ADEQ to conduct a groundwater tracing study in the area of the C&H Hog CAFO and the surrounding 17 manure spreading fields. This is an area of study NOT being addressed by the Big Creek Research and Extension Team. The information obtained by Dr. Van Brahana's team of scientists will be vitally important, not only in protecting the water quality of Big Creek and the Buffalo River, but also in (hopefully) developing a responsible set of regulations.

The topography of the Buffalo River watershed is porous limestone karst that allows rapid transport of water, quickly connecting surface water, ground water, wells, springs and streams. This rapid transport system will quickly distribute any pollutants and excess nutrients throughout the watershed, and needs to be thoroughly understood if responsible decisions are to be made for regulating dispersion of large amounts of agricultural waste from industrial animal farming. Through groundwater tracing, one can collect information to map the paths that water takes once underground, where it returns to the surface as springs, and calculate the speed with which it travels under different flow conditions from flooding to drought. The dyes used are not harmful to humans or to ecosystems, and have been used safely for this purpose throughout the United States for a long time.

Dr. Van Brahana has obtained permission from over 50 land owners in the area to go on or across their property, in order to inject dye into specific sink-holes or wells and to place dye receptors in springs, wells and streams. Calling on his almost 50 years of professional experience as a hydrogeologist, and the help of local residents with intimate knowledge of the area, Dr. Van Brahana has plotted over 10 dye injection sites

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<sup>1</sup> "Karst" is the term used by geologists to describe areas where the bedrock, usually limestone or dolomite, has been (or has the potential to be) easily dissolved by surface water or groundwater. Karst landscapes may have deep bedrock fractures, caves, disappearing streams, springs, or sinkholes. These features can be isolated or occur in clusters, and may be open, covered, buried, or partially filled with soil, field stones, vegetation, water or other miscellaneous debris. <http://wisconsingeologicalsurvey.org/karst.htm>

and several dozen dye receptor sites onto topographical maps. The injection sites are on or near the spreading fields. The timeline for the dye-trace study started in mid April, 2014, and present plans call for multiple tests to be run over the course of the next several years. Since mid April he and his team have injected three different dyes (which fluoresce at different frequencies) into three separate locations.

#### What the Dye Injection Data Show

Dr. Van Brahana's analysis of the collected dye receptor data has established that there is very fast flow (1500 to 1700 feet per day for a straight line distance), and that there are very diverse multiple flow directions from the injection sites. Dye from the 1<sup>st</sup> injection site (on the edge of one of the spreading fields) was recovered in Big Creek, several miles away, 30 hours after injection. A second dye, injected in a well surrounded by several spreading fields on the upper reaches of the farm, was recovered seven days later in Dry Creek, the Mt. Judea Bridge, and at several sites in and along Left Fork. The team will conduct more tests throughout the summer, both to verify the results obtained thus far, and to continue mapping flow paths from additional injection sites. Meanwhile, other members of the team are beginning to use the flow path information gathered thus far to strategically choose sampling sites for pathogen studies.

#### How will the Buffalo River be Affected?

Will we see rising *E. coli* counts, the appearance of residual antibiotics, or excess nutrients, such as phosphorus that promote algae growth in streams? If so, the use of dye tracing to map underground flow paths from C&H Hog Farm and the manure spreading fields to Big Creek and the Buffalo River could be useful to ascertain C&H Hog Farm's contribution to those problems.

#### Call for Action

Once again, let me highly recommend watching **A Mighty Struggle: The War to Keep the Buffalo River Clean and Pristine**. The documentary closes with a section listing many suggestions for getting involved.