ATTACHMENT A

Plan for Pumping Waste Storage Ponds

Operator Name C&H Hog Farms **Date** 02/10/14

County Newton **Pond ID or Legal Description** Waste Storage Pond 1 & 2

- **Method Selected for Land Application of Wastewater**

  _X_ Pipeline/Sprinkler System (Permanent): *Waste Storage Pond 2*
  _____ Big Gun Sprinkler (Temporary)
  _____ Drag Hose System
  _X_ Tank Wagon: *Waste Storage Pond 1*
  _____ Other (Explain)

- **Pre-Arranged Source of Application Equipment (List all necessary equipment and access to it).**

Type Equip.	Obtain Where
Pump	Proposed to Field 5-9
Pipe	Proposed to Field 5-9
Sprinkler	Proposed to Field 5-9
Vac Tanker	Fields 1-4 and 7-17

- **Fields Available for Land Application of Wastewater in an Emergency**

Legal Description	Landuse	Acres Available	Predom. Soil
Sec. 26, T15N, R20W	Grass	74.3	48

- **Holding Capacity of Ponds at Must Pumpdown Level** 2,469,903 **gallons**
  Bottom of 25-year, 24-hour storage level. Pond is to be pumped within 10 days below level.

- **Holding Capacity of Ponds at High Water Line** 3,495,464 **gallons**
  Top of 25-year, 24-hour storage level (bottom of freeboard)(Includes Concrete Pits).

- **Holding Capacity of Ponds between Freeboard and Must Pumpdown Elevation** 35,564 **gallons**
  Bottom of freeboard- Must Pumpdown Elevation.

- **Application Rates**

  The fertilizer value of wastewater in waste storage ponds is variable. Prior to land application, it is recommended to collect a representative sample from the pond and sent to a testing laboratory for analysis. If time does not permit waiting for test results, estimates of the nutrient content can be made from data previously collected at other facilities or from publications.

The land application rate should be calculated based on (1) the nutrient content of the wastewater, (2) current soil tests, (3) crop needs and (4) the water intake capacity (inches/hour) of the soil if an irrigation system is used.

For more information and/or assistance in calculating application rates, contact your local NRCS and Conservation District Office.

ATTACHMENT B

3.2.2.2 A copy of the CAFO's site-specific nutrient management plan must be maintained on site and made available to the Director upon request.

3.2.3 **Requirements relating to transfer of manure or process wastewater to other persons.** Prior to transferring manure, litter or process wastewater to other persons, Large CAFOs must provide the recipient of the manure, litter or process wastewater with the most current nutrient analysis. The analysis provided must be consistent with the requirements of 40 CFR 412. Large CAFOs must retain for five years records of the date, recipient name and address, and approximate amount of manure, litter or process wastewater transferred to another person.

3.2.4 **Annual reporting requirements for CAFOs.** The permittee must submit an annual report to the Director. The annual report all reports are due by the 31st day of January each year for the previous January – December reporting period (i.e. January 31, 2012 for Year 2011). The first report may include less than the 12 months of information and must include:

3.2.4.1 The number and type of animals, whether in open confinement or housed under roof (beef cattle, broilers, layers, swine weighing 55 pounds or more, swine weighing less than 55 pounds, mature dairy cows, dairy heifers, veal calves, sheep and lambs, horses, ducks, turkeys, other);
3.2.4.2 Estimated amount of total manure, litter and process wastewater generated by the CAFO in the previous 12 months (tons/gallons);
3.2.4.3 Estimated amount of total manure, litter and process wastewater transferred to other person by the CAFO in the previous 12 months (tons/gallons);
3.2.4.4 Total number of acres available for land application covered by the nutrient management plan developed in accordance with Part 3 of the permit;
3.2.4.5 Total number of acres under control of the CAFO that were used for land application of manure, litter and process wastewater in the previous 12 months;
3.2.4.6 Summary of all manure, litter and process wastewater discharges from the production area that have occurred in the previous 12 months, including date, time, and approximate volume;
3.2.4.7 A statement indicating whether the current version of the CAFO's nutrient management plan was developed or approved by a certified nutrient management planner; and
3.2.4.8 The actual crop(s) planted and actual yield(s) for each field, the actual nitrogen and phosphorus content of the manure, litter, and process wastewater, the results of calculations conducted in accordance with Parts 3.2.5.1.b and 3.2.5.2.d of this section, and the amount of manure, litter, and process wastewater applied to each field during the previous 12 months; and, for any CAFO that implements a nutrient management plan that addresses rates of application in accordance with Part 3.2.5.2 of this section, the results of any soil testing for nitrogen and phosphorus taken during the preceding 12 months, the data used in calculations conducted in accordance with Part 3.2.5.2.d of this section, and the amount of any supplemental fertilizer applied during the previous 12 months.

3.2.5 **Terms of the nutrient management plan.** Any permit issued to a CAFO must require compliance with the terms of the CAFO's site-specific nutrient management plan. The terms of the nutrient management plan are the information, protocols, best management practices, and other conditions in the nutrient management plan determined by the Director to be necessary to meet the requirements of Part 3.2.1 of this section. The terms of the nutrient management plan, with respect to protocols for land application of manure, litter, or process wastewater required by Part 3.2.1.8 of this section and, as applicable, 40 CFR 412.4(c), must

include the fields available for land application; field-specific rates of application properly developed, as specified in Parts 3.2.5.1 through 3.2.5.2 of this section, to ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater; and any timing limitations identified in the nutrient management plan concerning land application on the fields available for land application. The terms must address rates of application using one of the following two approaches, unless the Director specifies that only one of these approaches may be used:

3.2.5.1 **Linear approach**. An approach that expresses rates of application as pounds of nitrogen and phosphorus, according to the following specifications:

a The terms include maximum application rates from manure, litter, and process wastewater for each year of permit coverage, for each crop identified in the nutrient management plan, in chemical forms determined to be acceptable to the Director, in pounds per acre, per year, for each field to be used for land application, and certain factors necessary to determine such rates. At a minimum, the factors that are terms must include: the outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field; the crops to be planted in each field or any other uses of a field such as pasture or fallow fields; the realistic yield goal for each crop or use identified for each field; the nitrogen and phosphorus recommendations from sources specified by the Director for each crop or use identified for each field; credits for all nitrogen in the field that will be plant available; consideration of multi-year phosphorus application; and accounting for all other additions of plant available nitrogen and phosphorus to the field. In addition, the terms include the form and source of manure, litter, and process wastewater to be land-applied; the timing and method of land application; and the methodology by which the nutrient management plan accounts for the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied.

b Large CAFOs that use this approach must calculate the maximum amount of manure, litter, and process wastewater to be land applied at least once each year using the results of the most recent representative manure, litter, and process wastewater tests for nitrogen and phosphorus taken within 12 months of the date of land application; or

3.2.5.2 **Narrative rate approach.** An approach that expresses rates of application as a narrative rate of application that results in the amount, in tons or gallons, of manure, litter, and process wastewater to be land applied, according to the following specifications:

a The terms include maximum amounts of nitrogen and phosphorus derived from all sources of nutrients, for each crop identified in the nutrient management plan, in chemical forms determined to be acceptable to the Director, in pounds per acre, for each field, and certain factors necessary to determine such amounts. At a minimum, the factors that are terms must include: the outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field; the crops to be planted in each field or any other uses such as pasture or fallow fields (including alternative crops identified in accordance with Part 3.2.5.2.b of this section); the realistic yield goal for each crop or use identified for each field; and the nitrogen and phosphorus recommendations from sources specified by the Director for each crop or use identified for each field. In addition, the terms include the methodology by which the nutrient management plan accounts for the following factors when calculating the

amounts of manure, litter, and process wastewater to be land applied: results of soil tests conducted in accordance with protocols identified in the nutrient management plan, as required by Part 3.2.1.7 of this section; credits for all nitrogen in the field that will be plant available; the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied; consideration of multi-year phosphorus application; accounting for all other additions of plant available nitrogen and phosphorus to the field; the form and source of manure, litter, and process wastewater; the timing and method of land application; and volatilization of nitrogen and mineralization of organic nitrogen.

b The terms of the nutrient management plan include alternative crops identified in the CAFO's nutrient management plan that are not in the planned crop rotation. Where a CAFO includes alternative crops in its nutrient management plan, the crops must be listed by field, in addition to the crops identified in the planned crop rotation for that field, and the nutrient management plan must include realistic crop yield goals and the nitrogen and phosphorus recommendations from sources specified by the Director for each crop. Maximum amounts of nitrogen and phosphorus from all sources of nutrients and the amounts of manure, litter, and process wastewater to be applied must be determined in accordance with the methodology described in Part 3.2.5.2.a of this section.

c For CAFOs using this approach, the following projections must be included in the nutrient management plan submitted to the Director, but are not terms of the nutrient management plan: the CAFO's planned crop rotations for each field for the period of permit coverage; the projected amount of manure, litter, or process wastewater to be applied; projected credits for all nitrogen in the field that will be plant available; consideration of multi-year phosphorus application; accounting for all other additions of plant available nitrogen and phosphorus to the field; and the predicted form, source, and method of application of manure, litter, and process wastewater for each crop. Timing of application for each field, insofar as it concerns the calculation of rates of application, is not a term of the nutrient management plan.

d CAFOs that use this approach must calculate maximum amounts of manure, litter, and process wastewater to be land applied at least once each year using the methodology required in Part 3.2.5.2.a of this section before land applying manure, litter, and process wastewater and must rely on the following data:

i a field-specific determination of soil levels of nitrogen and phosphorus, including, for nitrogen, a concurrent determination of nitrogen that will be plant available consistent with the methodology required by Part 3.2.5.2.a of this section, and for phosphorus, the results of the most recent soil test conducted in accordance with soil testing requirements approved by the Director; and

ii the results of most recent representative manure, litter, and process wastewater tests for nitrogen and phosphorus taken within 12 months of the date of land application, in order to determine the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied.

3.2.6 **Changes to a nutrient management plan**. Any permit issued to a CAFO must require the following procedures to apply when a CAFO operator makes changes to the CAFO's nutrient management plan previously submitted to the Director:

3.2.6.1 The CAFO operator must provide the Director with the most current version of the CAFO's nutrient management plan and identify changes from the previous version,

ATTACHMENT C

Comments:

Arkansas Nutrient Managemnt Planner with 2009 PI (ver 3/3/2010)

Planner:	Nathan A. Pesta, P.E.	Date:	5/25/2012
Plan Description:	Jason Henson: Fields 1-10		

Manure Distribution Summary

Units Applied by Field and Source

Field	Source				
	WSP#1 (1000 gal)	WSP#2 (1000 gal)			
H1	389.19				
H2	168.34				
H3	136.04				
H4	87.05				
H5		1,923.92			
H6		2,797.24			
H7		6,017.52			
H8		1,255.50			
H9		3,340.70			
H10	596.74				
Total Applied	1,377	15335			
Available	1,230	1531			
Deficit/Surplus	-147	-13804			

Supplemental Documentation of Inputs and Results for P Index and RUSLE Calculations

Field	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10
Soil Map Unit	42	43	48	43	48	48	48	51	50	51
Soil Name	Noark very c	Noark very c	Razort loam,	Noark very c	Soil Name C	Soil Name C	Soil Name C	Spadra loam	Soil Name C	Spadra loam
Primary Litter Source	WSP#1	WSP#1	WSP#1	WSP#1	WSP#2	WSP#2	WSP#2	WSP#2	WSP#2	WSP#1
Source Type	Liquid Biosol	Liquid Biosol	Liquid Biosol	Liquid Biosol	Liquid Manur	Liquid Manur	Liquid Manur	Liquid Manur	Liquid Manur	Liquid Biosol
WEP (lb/ton)	1.9	1.9	1.9	1.9	0.07	0.07	0.07	0.07	0.07	1.9
TP Used (lb/ton)	12.6200873	12.6200873	12.6200873	12.6200873	10.1310044	10.1310044	10.1310044	10.1310044	10.1310044	12.6200873
Litter Appl. Rate (tons/acre)	25	9.9	10	9.9	81	81	81	81	81	18
WEP rate (lb/ac)	47.5	18.81	19	18.81	5.67	5.67	5.67	5.67	5.67	34.2
TP rate (lb/ac)	315.502183	124.938865	126.200873	124.938865	820.611354	820.611354	820.611354	820.611354	820.611354	227.161572
Alum Used	No	No	No	No	No	No	No	No	No	No
Mineralization Coef	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
WEP coef	0.029	0.029	0.029	0.029	0.031	0.031	0.031	0.031	0.031	0.029
WEP Source Value	1.76610317	0.69937685	0.70644127	0.69937685	1.4389291	1.4389291	1.4389291	1.4389291	1.4389291	1.27159428
Soil Test P	110.39	95.76	55.86	66.5	86.45	101.08	236.74	61.18	69.16	91.77
Soil coef	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
Soil P Source Value	0.198702	0.172368	0.100548	0.1197	0.15561	0.181944	0.426132	0.110124	0.124488	0.165186
Total P Source Value	1.96480517	0.87174485	0.80698927	0.81907685	1.5945391	1.6208731	1.8650611	1.5490531	1.5634171	1.43678028
R factor	270	270	270	270	270	270	270	270	270	270
Kf	0.43	0.43	0.37	0.43				0.37		0.37
Adj Kf For Freezing?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kf Used	0.35	0.35	0.3	0.35				0.3		0.3
Slope Gradient (%)	5.5	14	14	14	0.2	0.2	0.2	3.5	0.2	3.5
Slope Length (ft)	45	45	23	23	5	4	4	12	7	15

Comments:

Arkansas Nutrient Managemnt Planner with 2009 PI (ver 3/3/2010)

Planner:	Nathan A. Pesta, P.E.	Date:	5/25/2012
Plan Description:	Jason Henson: Fields 1-10		

Best Management Practices

Field	Diversion	Terrace	Pond	Filter Strip	Grassed Waterway	Fencing	Riparian Forest Buffer	Riparian Herbaceous Cover	Field Borderrs	Post BMP PI Value	P Index Range
H1										65	Medium
H2										80	High
H3										47	Medium
H4										75	High
H5											
H6											
H7											
H8										56	Medium
H9											
H10										52	Medium

Field Nutrient Application Planning

Per Acre Basis

Field	Nutrient Source	Application			Nutrient Recommendation (lb/ac)			Nutrients Applied (lb/ac)			Surpluses / Deficits (lb/ac)		
		PI Max	Planned		N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
H1	WSP#1	25.00	25.00	1000 gal/ac	489	57	220	188	145	146	-301	88	-75
H2	WSP#1	9.90	9.90	1000 gal/ac	489	57	220	74	57	58	-415	0	-162
H3	WSP#1	10.00	10.00	1000 gal/ac	489	57	220	75	58	58	-414	1	-162
H4	WSP#1	9.90	9.90	1000 gal/ac	489	57	220	74	57	58	-415	0	-162
H5	WSP#2	81.00	81.00	1000 gal/ac	489	57	220	489	376	379	0	319	159
H6	WSP#2	81.00	81.00	1000 gal/ac	489	57	220	489	376	379	0	319	159
H7	WSP#2	81.00	81.00	1000 gal/ac	489	57	220	489	376	379	0	319	159
H8	WSP#2	81.00	81.00	1000 gal/ac	489	57	220	489	376	379	0	319	159
H9	WSP#2	81.00	81.00	1000 gal/ac	489	57	220	489	376	379	0	319	159
H10	WSP#1	18.00	18.00	1000 gal/ac	489	57	220	135	104	105	-354	47	-115

Per Field Basis

Field	Nutrient Source	Application			Nutrient Recommendation (lbs)			Nutrients Applied (lbs)			Surpluses / Deficits (lb)		
		PI Max	Planned		N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
H1	WSP#1	389.19	389.19	1000 gal	7,613	887	3,425	2,927	2,250	2,265	-4,686	1,362	-1,160
H2	WSP#1	168.34	168.34	1000 gal	8,315	969	3,741	1,266	973	980	-7,049	4	-2,761
H3	WSP#1	136.04	136.04	1000 gal	6,653	775	2,993	1,023	786	792	-5,629	11	-2,201
H4	WSP#1	87.05	87.05	1000 gal	4,300	501	1,934	655	503	507	-3,645	2	-1,428
H5	WSP#2	1923.92	1923.92	1000 gal	11,615	1,354	5,225	11,621	8,927	9,004	6	7,573	3,778
H6	WSP#2	2797.24	2797.24	1000 gal	16,887	1,968	7,597	16,895	12,979	13,091	8	11,011	5,494
H7	WSP#2	6017.52	6017.52	1000 gal	36,328	4,235	16,344	36,346	27,921	28,162	18	23,687	11,818
H8	WSP#2	1255.50	1255.50	1000 gal	7,580	884	3,410	7,583	5,826	5,876	4	4,942	2,466
H9	WSP#2	3340.70	3340.70	1000 gal	20,168	2,351	9,074	20,178	15,501	15,634	10	13,150	6,561
H10	WSP#1	596.74	596.74	1000 gal	16,211	1,890	7,293	4,487	3,449	3,473	-11,724	1,559	-3,820
				Totals	135,669	15,814	61,037	102,981	79,115	79,784	-32,688	63,301	18,747

ATTACHMENT D

GENERAL COMMENTS	
THE GENERAL COMMENTS SECTION DOES NOT REQUIRE A RESPONSE	
As a reminder, per Part 3.2.4 of your permit your annual report is due to the Department by January 31, 2014. **Per Section B.3.c.4 of your NMP, soil samples for Nitrate-N and Phosphorus shall be taken no less than annually. This differs from Part 4.2.1.3 of your permit. Please ensure you continue to abide by the requirement of your NMP.** **At the time you indicated land application is only occurring by use of the vac tanker which coincides with your application records. Per Section M of your NMP, please ensure you only use a vac tanker on fields 1-4 and 10-17, and only use the pipeline/sprinkler system on Fields 5-9. Your NMP will need to be revised if you wish to use both practices to apply on a given field.** **A review of your application records indicated a rating of "Fair" for Field 17. When asked, you indicated the field was a "little soft" and this was noticed once you began applying and ruts from the equipment formed. However, you indicated you took appropriate action and immediately ceased application. Please see Photograph 3.** **The Holding Pond Level was below Must Pumpdown elevation. The level of Holding Pond 1 was low enough so that waste was not flowing over the spillway.** **Mortalities are promptly disposed of in the two incinerators that are on site. Please see Photograph 4.** **At the time of the investigation we did not note any violations pertaining to your application practices. You indicated you have implemented more stringent buffer and setback requirements than are documented in the permit.**	
INSPECTOR'S SIGNATURE: **Jason Bolenbaugh**	DATE: **1/28/2014**
SUPERVISOR'S SIGNATURE: ←Click text to left to add signature **-Supervisor Name**	DATE:

ATTACHMENT E

Final Report

Land Application of Accumulated Solids From Liquid Waste Systems Demonstration Project

E.P.A. 319(h) FY 1997 Project 700

Prepared and Submitted by the
Arkansas Department of Environmental Quality
Environmental Preservation Division

September 30, 2002

During the Swine Project, the pond contents of LAWMS at five participating farms were extensively characterized to determine nutrient and solids concentrations. The results of this work demonstrated that pond contents are not uniform mixtures, but are stratified. A surficial gray water layer, with relatively low concentrations of solids and nutrients was found on top of a solids layer having a comparatively high concentration of solids and nutrients. The stratified pond contents required considerable mechanical effort during agitation in order to arrive at a homogeneous mixture that could be pumped and evenly distributed onto application sites. Figure 1 compares typical nutrient concentrations observed in samples collected at discreet intervals within maintained and non-maintained swine farm holding ponds. If LAWMS holding ponds are routinely cleaned-out (maintained) a more agronomically favorable nitrogen to phosphorus (N to P) ratio can exist in the ponds. However, if a farmer merely land applies gray water in order to maintain the required minimum freeboard levels (non-maintained), N is lost through ammonia volatilization and microbiological activity while P accumulates, resulting in a more unfavorable N to P ratio. As an example, the ratio of nitrogen and phosphorus uptake by bermuda and fescue grass is approximately 10 to 1 (NRCS Agricultural Waste Management Field Handbook)[4]. In other words, for every 10 pounds of nitrogen that a pasture of fescue assimilates, one pound of phosphorus will be utilized. When fertilizer is applied to a crop it should be done in a manner in which the requirements of the crop are met without over-applying nutrients. Manure storage ponds that are not routinely maintained result in an unbalanced N to P ratio. Years of continued solids accumulation will lead to a high concentration of nutrients, agronomically unbalanced N to P ratios and an overall loss of storage volume in LAWMS.

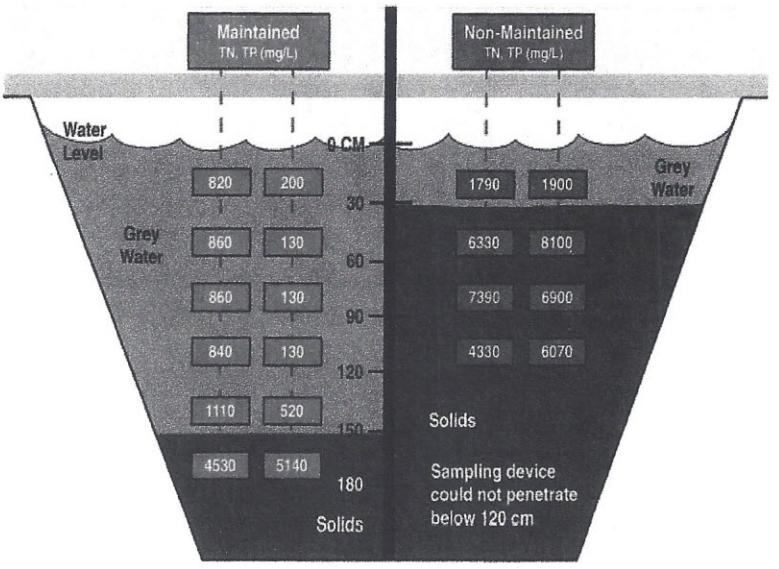

Figure 1. Typical Concentrations of Nutrients in Maintained and Non-Maintained LAWMS

A component of the Swine Project was developed to identify the effect that soil type has on nutrient losses from fields receiving liquid manure applications. In that work, swine manure slurry was land applied to test plots with identical slopes and vegetation and at the recommended N based loading rate for a Tall Fescue cover crop. The test plots were then rained on at a specified intensity and a known volume using rainfall simulation equipment. It was found that the application of waste significantly increased nutrient concentrations in storm water runoff as well as runoff volume. Depending upon soil type, 1.8 to 6.2% of total N, and 2.0 to 9.6% of total P that was land applied was lost in storm water runoff from manure fertilized test plots[5]. This work indicated that, even under controlled conditions, nutrient loss occurs through storm water runoff following the land application of manure. In order to land apply liquid manure in a way

that will result in the least amount of nutrients being transported to lakes and streams as non-point source pollution every effort must be made to control the pertinent variables. Land application variables can be best controlled by accurately estimating the nutrient load contained within storage structures and then proceeding through a thoughtful, careful planning process in which an easily followed course of action is outlined and implemented.

Another nutrient management related concern identified in the Swine Project was the build up of phosphorus in the soil, generally described by soil test phosphorous (STP), on certain application sites. STP concentrations in the soils of the most convenient fields for land application, typically, those fields immediately adjacent to the LAWMS, commonly exceeded 300 pounds per acre. This value exceeds the concentration considered by many professionals in the field of non-point source pollution to be an upper cut off level for additional applications of the nutrient. Values approaching or exceeding the upper limit of the Melich III test method are not uncommon in areas with high densities of confined animal production facilities. The high STP issue created additional difficulties when attempting to address solids and nutrient accumulation problems in LAWMS. Pastures exceeding the 300 pounds per acre concentration could not be recommended for land application of accumulated swine manure solids during the Swine Project.

Many of the problems observed during the Swine Project regarding the operation of LAWMS could be attributed to, or exacerbated by, the geographic locations of the facilities. All of the participating farms were constructed within hilly or mountainous terrain which greatly affected all aspects of manure management activities. From controlling and excluding storm water, to accessing holding ponds and land application sites located on steep hill sides with equipment, farm locations created operational challenges for farmers. However, the terrain on which the cooperating Swine Project farms were located was not unique to the Buffalo River watershed, hillsides and hilltops are frequently the locations for confined animal facilities in Arkansas. Questions were raised as to whether the accumulation of manure solids and associated nutrients observed in the Swine Project was merely a localized phenomenon or were the issues noted with LAWMS common throughout the swine industry in Arkansas.

In Arkansas, the swine production industry is concentrated in the north-western part of the state (Figure 2). Farms are typically concentrated in a region to reduce integrator expense associated with the transportation of animals and feed as well as to facilitate better oversight of the production process. Few swine facilities are located in the Arkansas delta region where manure derived nutrients could be readily utilized by grain or cotton crops. The scarcity of confined animal facilities in Eastern and Southern Arkansas may be due to the land and time requirements associated with the current agricultural economy of the "delta" region. In any event, most confined animal operations are located in a portion of the state that is often hilly or mountainous with soils that are not highly productive and cannot utilize a large mass of nutrients. The general geographic location of the industry highlights the necessity for effective manure management. As seen in Figure 2, most swine production is concentrated within a 40 mile radius of Dierks in Howard County, Russellville in Pope County and Fayetteville in Washington County. From a nutrient management perspective, it should be noted that the areas of high swine farm density overlap areas of high poultry broiler farm density.

ATTACHMENT F

UofA UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE

Cooperative Extension Service
Soil Analysis Report
Soil Testing And Research Laboratory
Marianna, AR 72360
http://www.uark.edu/depts/soiltest

The University of Arkansas is an equal opportunity/affirmative action institution

JASON HENSON		Client ID:	8706881318
HC 72 BOX 10			
MTN JUDEA	AR		72655

Date Processed:	2/17/2012
Field ID:	7
Acres	150
Lime Applied in the last 4 years:	No
Leveled in past 4 years:	No
Irrigation:	Unknown
County:	Pope
Lab Number:	36728
Sample Number:	931080

1. Nutrient Availability Index

Nutrient	Concentration		Soil Test Level (Mehlich 3)
	ppm	lb/acre	
P	178	356	Above Optimum
K	207	414	Above Optimum
Ca	1228	2456	--
Mg	154	308	--
SO4-S	14	28	--
Zn	14.5	29.0	--
Fe	218	436	--
Mn	168	336	--
Cu	3.2	6.4	--
B	0.0	0.0	--
NO3-N	12	24	--

2. Soil Properties

Property	Value	Units
Soil pH (1:2 soil-water)	6.3	---
Soil EC (1:2 soil-water)		umhos/cm
Soil ECEC	11	cmolc/kg
Organic Matter (Loss on Ignition)		%
Estimated Soil Texture	Silt Loam	

Estimated Base Saturation (%)				
Total	Ca	Mg	K	Na
72.8	55.7	11.6	4.8	0.7

3. Recommendations

(Notice: State and/or federal nutrient management regulations may supersede these agronomic recommendations.)

Crop		N	P2O5	K2O	SO4S	Zn	B	Lime
Last Crop	Pasture (207)	lb/acre						
Crop 1	Warm-Season Grasses (MNT) (207)	60	0	0	0	0	0	0
Crop 2	Warm-Season Grasses (MNT) (207)	60	0	0	0	0	0	0
Crop 3								

4. Crop 1 Notes:

Apply the recommended rates of N, P, and K, in spring when night temperatures are > 60 degrees F for 1 week. For higher production, topdress an additional 60 lb N/Acre after every 4 to 6 weeks of grazing. For fall grazing apply 50 lb N/Acre in early August. Do not apply N after September 1.

5. Crop 2 Notes:

Apply the recommended rates of N, P, and K, in spring when night temperatures are > 60 degrees F for 1 week. For higher production, topdress an additional 60 lb N/Acre after every 4 to 6 weeks of grazing. For fall grazing apply 50 lb N/Acre in early August. Do not apply N after September 1.

6. Crop 3 Notes:

ATTACHMENT G

Draft
Not Professionally Formatting

University of Arkansas Swine Manure Demonstration Project

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INTRODUCTION

The Arkansas Water Quality Inventory Report for 1994 lists the expansion of confined animal production as a special state concern. The report indicates that in the areas of animal production, the reduced water quality attributed to agriculture is primarily due to elevated nutrient and pathogen concentrations. The report also mentions an increased incidence of high nitrate concentration in wells and springs in areas of concentrated animal operations.

Figure 2: Runoff plots 1,2,3, &4 from right to left with the runoff collectors in the foreground.

Modern swine rearing facilities often have large numbers of animals and a relatively limited land base for manure application. Disposal of the manure in a manner that minimizes odor and optimizes nutrient utilization is an increasing concern. Manure is a valuable resource as an alternative source of fertilizer nitrogen (N), phosphorus (P), and potassium (K) in maintaining and restoring soil productivity. In fact, by improving ground cover, runoff volume and erosion may also be reduced. However, application rates greater than crop needs has been shown to result in nitrate (NO3) movement through the soil into ground water and can result in an excessive rise in soil test P levels leading to increased phosphorus runoff concerns. This can be a problem, since phosphorus is normally the limiting nutrient for eutrophication in freshwater systems. Odor and nutrient problems can both be increased by excessive nutrient buildup in lagoons/holding ponds if manure solids are allowed to accumulate over a number of years.

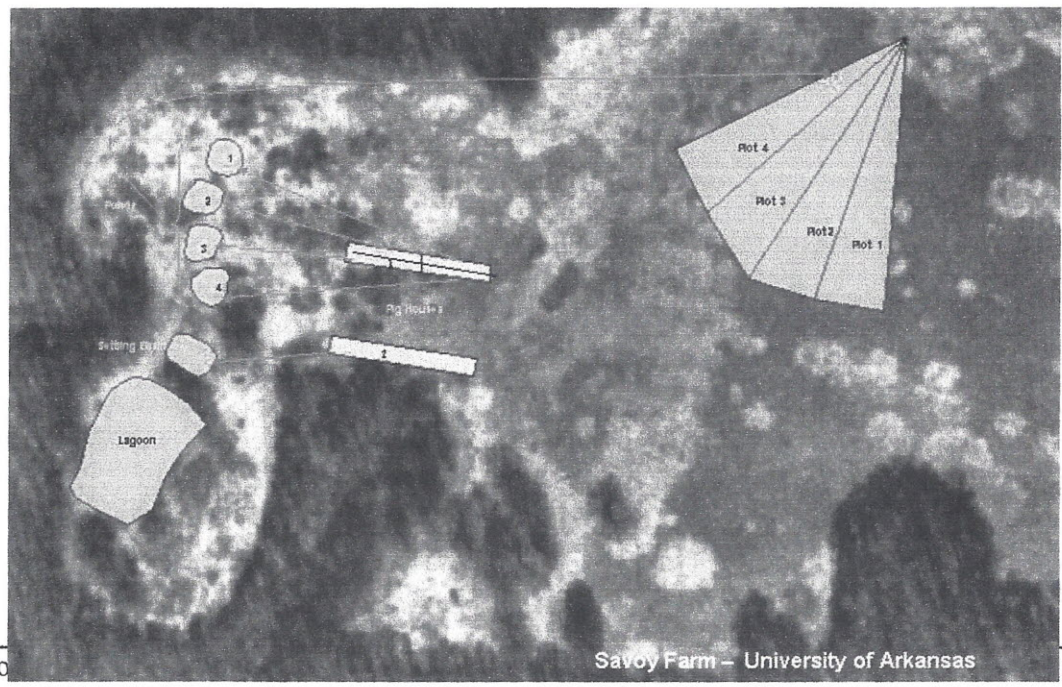
Arkansas was the twelfth highest swine producing state in the nation at the initiation of this project. Of the 2 million swine produced annually, the vast majority are raised on farms with liquid manure handling systems. On these farms, the animals are housed in total confinement facilities where the manure is handled with the addition of supplemental water. Water is typically used to flush the manure from the house into storage/treatment basins until it is land applied to supply the nutrient (nitrogen) needs of a forage crop. While this approach has the advantages of production economics, animal health, beneficial use of the manure for crops, and environmental preservation (with proper management), there are a couple points of concern.

SOIL PHOSPHORUS CONCERNS

The first concern in swine manure management is related to the phosphorus content of the manure. Typically the manure is applied based on the

receiving crop's nitrogen requirements. As a result, more phosphorus is applied than the crop will normally utilize (around five fold), thereby resulting in a phosphorus buildup in the soil. The phosphorus content of surface soil directly influences the loss of phosphorus in runoff (Daniel et al., 1994), which can reduce surface water quality. Runoff losses from manure are a particular concern in regions where confined animal operations exist in proximity to surface water bo

Figure 1: Aerial view showing the location of the swine barns (in white), manure storages (in green) and the runoff plots (in tan)



rates to (Daniel et al., 1994). Because of this concern, some states have established subjective threshold soil phosphorus levels intended to ensure continued crop production while not producing eutrophic inducing runoff.

While phosphorus-based application rates would in theory reduce this risk, they would also greatly increase the required land application area, and require the purchase of commercial nitrogen and potassium fertilizers to maintain forage production. Both results present problems. On many farms, the required additional acreage is not readily available. Continued operation would require transporting the manure to more distant application sites. The additional distance to the land application sites, if available, would increase the required time to apply the manure, which would increase the difficulty of proper manure management and the likelihood of point-source discharges from the ponds. Furthermore, the additional commercial fertilizer cost would lead to under fertilization of pastureland in many cases. The low fertility condition could potentially result in a reduction in ground cover and an increase in erosion. In addition to these meet crop phosphorus needs would adversely affect economic pork production. This in turn could have significant economic impacts on the state economy. Especially since these phosphorus concerns are shared by the poultry industry.

A better approach to addressing soil phosphorus buildup concerns is to reduce the phosphorus levels in the manure. Doing so would still supply the crop's phosphorus needs, while reducing the amount of phosphorus available to potentially degrade surface water quality.

MANURE SOLIDS CONCERNS

A second point of concern is the difficulty of handling manure solids that fall from suspension

ATTACHMENT H

Plan for Pumping Waste Storage Ponds

Operator Name C&H Hog Farms **Date** 02/10/14

County Newton **Pond ID or Legal Description** Waste Storage Pond 1 & 2

- **Method Selected for Land Application of Wastewater**

  _X_ Pipeline/Sprinkler System (Permanent): *Waste Storage Pond 2*
  _____ Big Gun Sprinkler (Temporary)
  _____ Drag Hose System
  _X_ Tank Wagon: *Waste Storage Pond 1*
  _____ Other (Explain)

- **Pre-Arranged Source of Application Equipment (List all necessary equipment and access to it).**

Type Equip.	Obtain Where
Pump	Proposed to Field 5-9
Pipe	Proposed to Field 5-9
Sprinkler	Proposed to Field 5-9
Vac Tanker	Fields 1-4 and 7-17

- **Fields Available for Land Application of Wastewater in an Emergency**

Legal Description	Landuse	Acres Available	Predom. Soil
Sec. 26, T15N, R20W	Grass	74.3	48

- **Holding Capacity of Ponds at Must Pumpdown Level** 2,469,903 **gallons**
  Bottom of 25-year, 24-hour storage level. Pond is to be pumped within 10 days below level.

- **Holding Capacity of Ponds at High Water Line** 3,495,464 **gallons**
  Top of 25-year, 24-hour storage level (bottom of freeboard)(Includes Concrete Pits).

- **Holding Capacity of Ponds between Freeboard and Must Pumpdown Elevation** 35,564 **gallons**
  Bottom of freeboard- Must Pumpdown Elevation.

- **Application Rates**

  The fertilizer value of wastewater in waste storage ponds is variable. Prior to land application, it is recommended to collect a representative sample from the pond and sent to a testing laboratory for analysis. If time does not permit waiting for test results, estimates of the nutrient content can be made from data previously collected at other facilities or from publications.

Attachment 1

LAND USE CONTRACT

I, E. G. Campbell (Landowner), agree to allow Jason Henson (Operation Owner) to land apply waste from his/her Hog Farm (Type of Operation) operation located in the ____ (1/4 Section) 1/4 of Section 26 (Section) in Township 15N (Township) and Range 20W (Range) in Newton (County of Operation) County to 74.3 (Total Acreage Available) acres of my property located in Newton (County of Application Site) County. A description of the areas to be used as land application sites are as follows:

Site No.	¼ Section	Section	Township	Range	Latitude	Longitude	Available Acreage*
7	NE	26	15N	20W	35.922	-93.067	74.3
and	SE						

*Available acreage is the total acreage minus buffer zone areas.

I am also aware that the land applicator or the owner of the operation is to apply waste according to the management plan and guidelines and conditions set forth by the Arkansas Department of Environmental Quality.

In addition to these guidelines, the following requirements must also be satisfied when applying waste to my land:

Jason Henson — Operation Owner Signature — 3-21-12 — Date

E. G. Campbell — Landowner Signature — 3-21-12 — Date

ATTACHMENT I

C & H Hog Farm- Field 7 after heavy rain on March 16, 2014

ATTACHMENT J