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Carney Bates & Pulliam PLLC

May 15, 2013

Teresa Marks, Director
ARKANSAS DEPARTMENT OF ENVIRONMENTAL
QUALITY
5301 Northshore Drive
North Little Rock, AR 72118-5317

Dear Director Marks:

I am writing on behalf of the Ozark Society, Buffalo River Watershed Alliance, National Parks Conservation Association and the Arkansas Canoe Club.

As you have recognized in recent public statements and media interviews, the most important component of a CAFO hog farm permit application is the Nutrient Management Plan ("NMP"). This is the document that is *intended to* demonstrate that the hog waste from the facility can be applied to the chosen fields so that the nutrients (phosphorus and nitrogen) do not run off the field into nearby waterways or percolate downward through the karst geology. In the Ozarks, the nutrient of primary concern is phosphorus. It is what causes the growth of nuisance algae. Accordingly, as ADEQ, the University of Arkansas, and the CAFO general permit recognize, the NMP in a CAFO permit application *must* be premised on a phosphorus analysis.

Cargill-supplied C&H Hog Farms' NMP is woefully inadequate and contains significant omissions, errors and misrepresentations requiring ADEQ to revoke the permit in accordance with Ark Code § 8-4-204 and Part 6.3 of the CAFO General NPDES Permit. A close look at the foundational information upon which the NMP is based demonstrates that C&H Hog Farms is proposing to dump additional phosphorus-laden hog waste onto fields that already have all, *or more than*, the phosphorus they need. Accordingly, if ADEQ permits C&H Hog Farms to proceed with its industrial hog farm and waste application, significant amounts of phosphorus will be available for runoff into groundwater, Big Creek and downstream to the Buffalo River, causing nuisance algae and significantly altering the ecology of the stream system.

A NMP should meet the minimal requirements under *any* circumstances, no matter what the nearby waterways. However, the public expects and deserves heightened vigilance of its public officers when the receiving waters are the Buffalo River and its watershed.

The Permit raises a number of concerns, but we forward this letter focusing on the phosphorous analysis in NMP in the interest of time. What follows is an outline of some of the fundamental shortcomings, errors, misrepresentations, and omissions in the NMP submitted with C&H Hog Farms' permit application.

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For your convenience, a complete copy of the NMP is enclosed along with attachments highlighting the specific sections noted in the analysis.

I. SIGNIFICANT ERRORS, OMISSIONS AND MISREPRESENTATIONS IN THE C&H HOG FARMS' NUTRIENT MANAGEMENT PLAN.

1. The foundation of any NMP is the soil tests conducted by the University of Arkansas' Department of Agriculture. In this instance, those soil tests show that 15 of 17 fields¹ – 87% of *the hog-waste application area* – already have “optimum” or “above optimum” levels of phosphorus. Attachment 1. This means that even before any hog waste is applied, 87% of the fields have all (optimum) or more than (above optimum) the phosphorus the fields need to grow pasture or hay. Not surprisingly, it follows that in the soil test results, the University of Arkansas recommends that *no* additional phosphorus be applied to *any* of these 15 fields.
2. One would think that given the soil tests, Cargill-supplied C&H Hog Farms would have searched out another location to place its hog farm and dump its hog waste. Instead, C&H Hog Farms misrepresented in its permit application that “[b]ased on current soil tests results, there are no fields at this time that are identified as having high and/or very high soil phosphorus (P) levels”. Attachment 2. *This is simply not true.* Again, the soil testing shows that 15 fields (87% of the application area) have all or more than the phosphorus they need and that *no* more phosphorus should be applied. Attachment 1.
3. Another confounding issue obscured by C&H Hog Farms' permit application is the susceptibility of the application fields to flooding by Big Creek during the application time period. Based on soil maps, 7 of the 17 fields (43% of the application area) are “occasionally flooded” by Big Creek and its tributaries. Attachment 3. C&H Hog Farms obscures this information by denoting “#N/A” for Fields 5, 6, 7 & 9 (64% of the flooded fields) under the “flooding frequency” column of its “Arkansas Nutrient Management Planner” table. Attachment 4 (Fields 1-10 at p. 2). C&H Hog Farms does not explain under what circumstances flooding would not be an “applicable” consideration. Compounding the problem, all 7 of these “occasionally flooded” fields already have all or more than the phosphorus they need. Further compounding, the application time period proposed in the NMP is March through June, when flooding is most likely. Attachment 4 (Fields 1-10 at p. 5; Fields 11-17 at p. 5).
4. To further obscure the phosphorus problem, for Fields 5, 6 7 & 9 – all “occasionally flooded” fields adjacent to Big Creek that already have all or more than the phosphorus they need – the NMP improperly switches from a phosphorus-based analysis to a nitrogen-based analysis, with no explanation. Attachments 4 & 5. Of course, switching the basis of the analysis does not change the characteristics of the hog waste. It still contains phosphorus. But it does provide C&H Hog Farms an opportunity to obscure and ignore the phosphorus problem. *However, this switch to a nitrogen-based analysis violates Section 3.1 of the General Permit, which requires the NMP to be developed in accordance with the Arkansas Phosphorus Index*

¹ Fields 1-12, 14, & 16-17.

2010. Indeed, you and Mr. Bailey stressed the phosphorus requirement in your PowerPoint presentation at the public meeting in Jasper on May 8, 2013. Attachment 6.

5. In addition, C&H Hog Farms' "Arkansas Nutrient Management Planner" misrepresents the nutrient recommendations for phosphorus for 15 of the 17 fields (*87% of the hog-waste application area*). For each of these fields (#1-12, 14, & 16-17), C&H Hog Farms' NMP misrepresents that the nutrient recommendation for phosphorus is 57 lb/ac (Tab 4), when in truth the recommended application level is *zero*, as set forth above. *Compare* Attachment 4 (Fields 1-10 at p. 3; Fields 11-17 at p. 3) *with* Attachment 1.

6. All the above begs the question -- why do the misrepresentations, sleights of hand and obfuscations converge around Fields 5, 6, 7 & 9? All four of these fields share the following characteristics:

- All are adjacent to Big Creek and therefore of critical concern when it comes to the danger of phosphorus runoff into the Buffalo River watershed;
- All have "above optimum" soil test results, which means they all *already* have *more* phosphorus than they need;
- All are "occasionally flooded" by Big Creek;
- All are large, comprising 28% of the proposed application area;
- All are flat and located in closest proximity to the Hog Farm operation, making them the most economically viable fields for applying hog waste.

In short, the significant problems with the NMP converge on the fields of greatest concern (closest to Big Creek, prone to flood and already overloaded with phosphorous) and most likely to bear the brunt of the hog waste application from an economic perspective because they are the cheapest and easiest for the operator to access.

7. Finally, C&H Hog Farms reports that 80% of the phosphorus is "lost" during "storage" before it is applied on the fields. Attachment 4 at p. 1. What this really means is that the phosphorus is absorbed into the sludge that falls to the bottom of the waste disposal ponds. However, the NMP goes on to say that this sludge – and the *enormous* amount of phosphorus it contains – is going to be regularly pulled out of the ponds and disposed of by land application. Attachment 7. But nowhere does the NMP explain where or how the sludge will be applied or how fields that are already overloaded with phosphorus are expected to absorb even more phosphorous.

II. ADEQ IS CHARGED WITH THE DUTY TO REVOKE C&H HOG FARMS' PERMIT BECAUSE IT WAS OBTAINED BY MISREPRESENTATION AND FAULURE TO DISCLOSE ALL RELEVANT AND REQUIRED FACTS.

Ark Code § 8-4-204 (Permits—Revocation) (Attachment 8) provides:

The Arkansas Department of Environmental Quality or its successor is given and charged with the power and duty to revoke, modify, or suspend, in whole or in part, for cause any permit issued under this chapter, including, without limitation:

- (1) Violation of any condition of the permit;
- (2) Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; or
- (3) A change in any applicable regulation or a change in any preexisting condition affecting the nature of the discharge that requires either a temporary or permanent reduction or elimination of the permitted discharge.

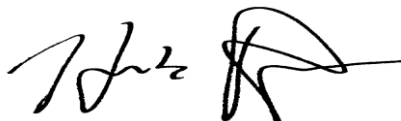
Similarly, Part 6.3 of the CAFO general permit (Attachment 9) provides:

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:

- a. Violation of any terms or conditions of this permit; or
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
- c. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

At the Jasper public meeting, you committed that if there were misrepresentations or significant omissions of relevant facts in C&H Hog Farms' permit application you would revoke, modify, or suspend the permit. As shown above, C&H Hog Farms' NMP fails to disclose fully all relevant facts. Indeed, it fails to disclose all *required* facts and to conduct the *required* analysis. Moreover, it includes significant misrepresentations. Based upon the forgoing, I respectfully ask you to stand by your public commitment, honor the duty you are charged to perform, and revoke C&H Hog Farms' permit.

Sincerely,

A handwritten signature in black ink, appearing to read 'Hank Bates', with a stylized flourish extending to the right.

Hank Bates

HB/jcg
Enclosures

ATTACHMENT 2

Section D. Fields Targeted for Phosphorus Based Manure Management

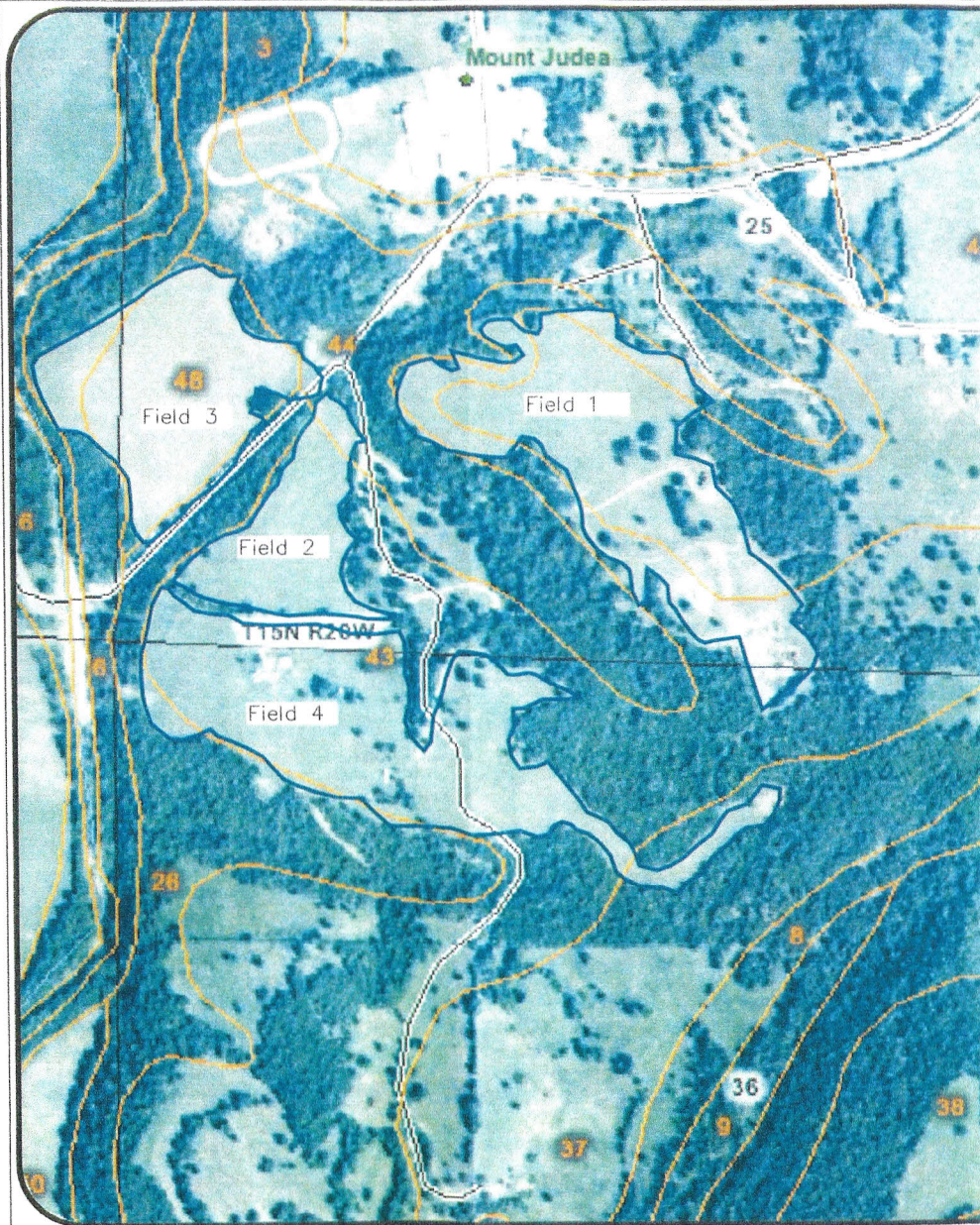
Operator Name C&H Hog Farms Date 05/29/2012

Based on current soil test results, there are no fields at this time that are identified as having high and/or very high soil phosphorus (P) levels. Refer to the previous page, including Table 1, for manure management guidelines to avoid further or unnecessary phosphorus buildup. Other management options are also available for consideration.

| Sprdsht. Line | Field ID 1/ (Tract & Field) | Legal Description | | | Acres Available | Soil Phosphorus Test 2/ | | Date Tested |
|---------------|--------------------------------|-------------------|--------|-------|-----------------|-------------------------|--|-------------|
| | | Section | Twp. | Range | | Mehlich 3 (PPM) | | |
| 51 | H1 | 25 | 15N | 20W | 15.6 | 83 | | 2/17/12 |
| 52 | H2* | 25 | 15N | 20W | 17.0 | 72 | | 2/17/12 |
| 53 | H3 | 25 | 15N | 20W | 13.6 | 42 | | 2/17/12 |
| 54 | H4 | 36 | 15N | 20W | 8.8 | 50 | | 2/17/12 |
| 60 | H10* | 35 | 15N | 20W | 33.2 | 69 | | 2/17/12 |
| 51 | H11* | 35 | 15N | 20W | 20.7 | 57 | | 2/17/12 |
| 52 | H12* | 35 | 15N | 20W | 23.7 | 19 | | 2/17/12 |
| 53 | H13* | 35 | 15N | 20W | 61.6 | 48 | | 2/17/12 |
| 54 | H14* | 35 | 15N | 20W | 18.0 | 52 | | 2/17/12 |
| 55 | H15* | 2 | 14N | 20W | 61.0 | 15 | | 2/17/12 |
| 56 | H16* | 2 | 14N | 20W | 79.6 | 48 | | 2/17/12 |
| 57 | H17* | 34/3 | 15/14N | 20W | 88.7 | 50 | | 2/17/12 |
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1/ Place an asterisk (*) next to fields not owned by operator.
 2/ An increase or decrease in phosphorus levels should be monitored with future soil tests to determine any needed manure application rate adjustments.

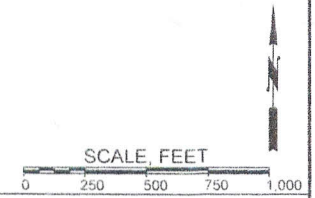
ATTACHMENT 3



LEGEND

- 2 Arkana-Moko complex, 8 to 20 percent slopes
- 3 Arkana-Moko complex, 20 to 40 percent slopes
- 6 Ceda-Kenn complex, frequently flooded
- 7 Clarksville very cherty silt loam, 20 to 50 percent slopes
- 8 Eden-Newnata complex, 8 to 20 percent slopes
- 9 Eden-Newnata complex, 20 to 40 percent slopes
- 15 Enders-Leesburg stony loams, 8 to 20 percent slopes
- 16 Enders-Leesburg stony loams, 20 to 40 percent slopes
- 26 Moko-Rock outcrop complex, 15 to 50 percent slopes
- 37 Nella-Steptock complex, 8 to 20 percent slopes
- 38 Nella-Steptock-Mountainburg very stony loams, 20 to 40 percent slopes
- 39 Nella-Steptock-Mountainburg very stony loams, 40 to 60 percent slopes
- 42 Noark very cherty silt loam, 3 to 8 percent slopes
- 43 Noark very cherty silt loam, 8 to 20 percent slopes
- 44 Noark very cherty silt loam, 20 to 40 percent slopes
- 48 Razort loam, occasionally flooded
- 50 Spadra loam, occasionally flooded
- 51 Spadra loam, 2 to 5 percent slopes
- 54 Water

GENERAL NOTES

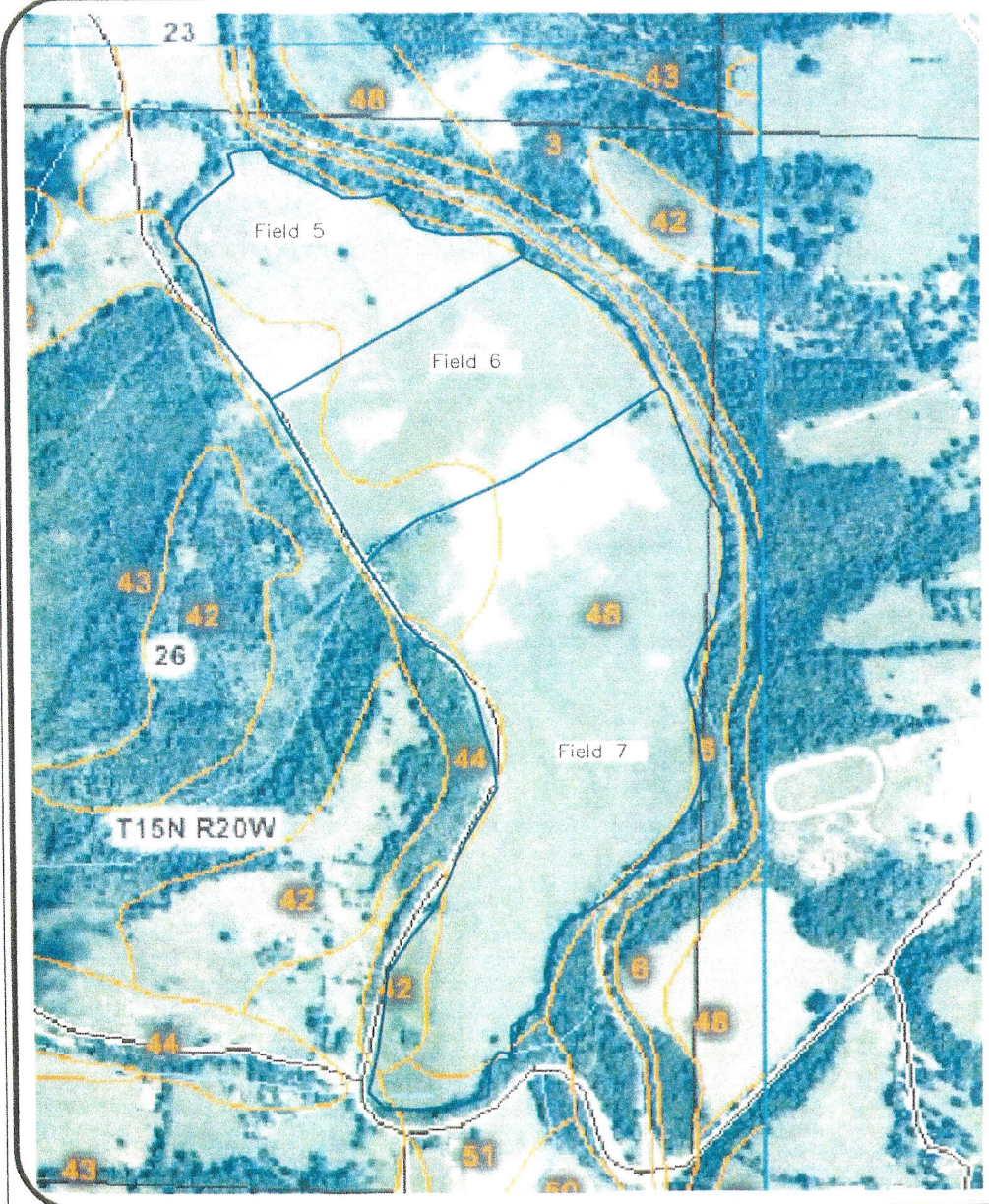


| No. | Revision/Issue | Date |
|-----|----------------|------|
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| | | |

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 Consulting Engineers
 PO Box 522, Mandan, ND 58554
 (701) 663-1116, FAX: (701) 667-1356
 www.dgaengineering.com

C&H HOG FARMS
 GESTATION-FARROWING FARM
 SECTION 25 AND 36, T 15 N, R 26 W
 NEWTON COUNTY, AR
 FIELDS 1-4

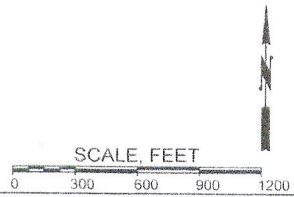
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| DATE: MAY 29, 2012 | 1 |
| SCALE: 1" = 500' | |
| DRAWN BY: NAP | |
| CHECKED BY: DLD | |



LEGEND

- 3 Arkana-Moko complex, 20 to 40 percent slopes
- 6 Ceda-Kenn complex, frequently flooded
- 11 Enders gravelly loam, 3 to 8 percent slopes
- 13 Enders stony loam, 3 to 20 percent slopes
- 26 Moko-Rock outcrop complex, 15 to 50 percent slopes
- 35 Nella-Enders stony loams, 8 to 20 percent slopes
- 42 Noark very cherty silt loam, 3 to 8 percent slopes
- 43 Noark very cherty silt loam, 8 to 20 percent slopes
- 44 Noark very cherty silt loam, 20 to 40 percent slopes
- 48 Razort loam, occasionally flooded
- 50 Spadra loam, occasionally flooded
- 51 Spadra loam, 2 to 5 percent slopes
- 54 Water

GENERAL NOTES



| No | Revision/Issue | Date |
|----|----------------|------|
| | | |

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C&H HOG FARMS
GESTATION-FARROWING FARM

SECTION 26, T 15 N, R 20 W
 NEWTON COUNTY, AR

FIELDS 5-7

| | |
|-----------------------|---|
| DATE: MAY 29, 2012 | 2 |
| SCALE: 1" = 600' | |
| DRAWN BY: NAP | |
| CHECKED BY: DLD | |



LEGEND

- 1 Arkana very cherty silt loam, 3 to 8 percent slopes
- 2 Arkana-Moko complex, 8 to 20 percent slopes
- 6 Ceda-Kenn complex, frequently flooded
- 11 Enders gravelly loam, 3 to 8 percent slopes
- 13 Enders stony loam, 3 to 20 percent slopes
- 26 Moko-Rock outcrop complex, 15 to 50 percent slopes
- 35 Nella-Enders stony loams, 8 to 20 percent slopes
- 37 Nella-Steprock complex, 8 to 20 percent slopes
- 42 Noark very cherty silt loam, 3 to 8 percent slopes
- 43 Noark very cherty silt loam, 8 to 20 percent slopes
- 44 Noark very cherty silt loam, 20 to 40 percent slopes
- 48 Razort loam, occasionally flooded
- 50 Spadra loam, occasionally flooded
- 51 Spadra loam, 2 to 5 percent slopes
- 54 Water

GENERAL NOTES

SCALE FEET

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| No. | Revision/Issue | Date |
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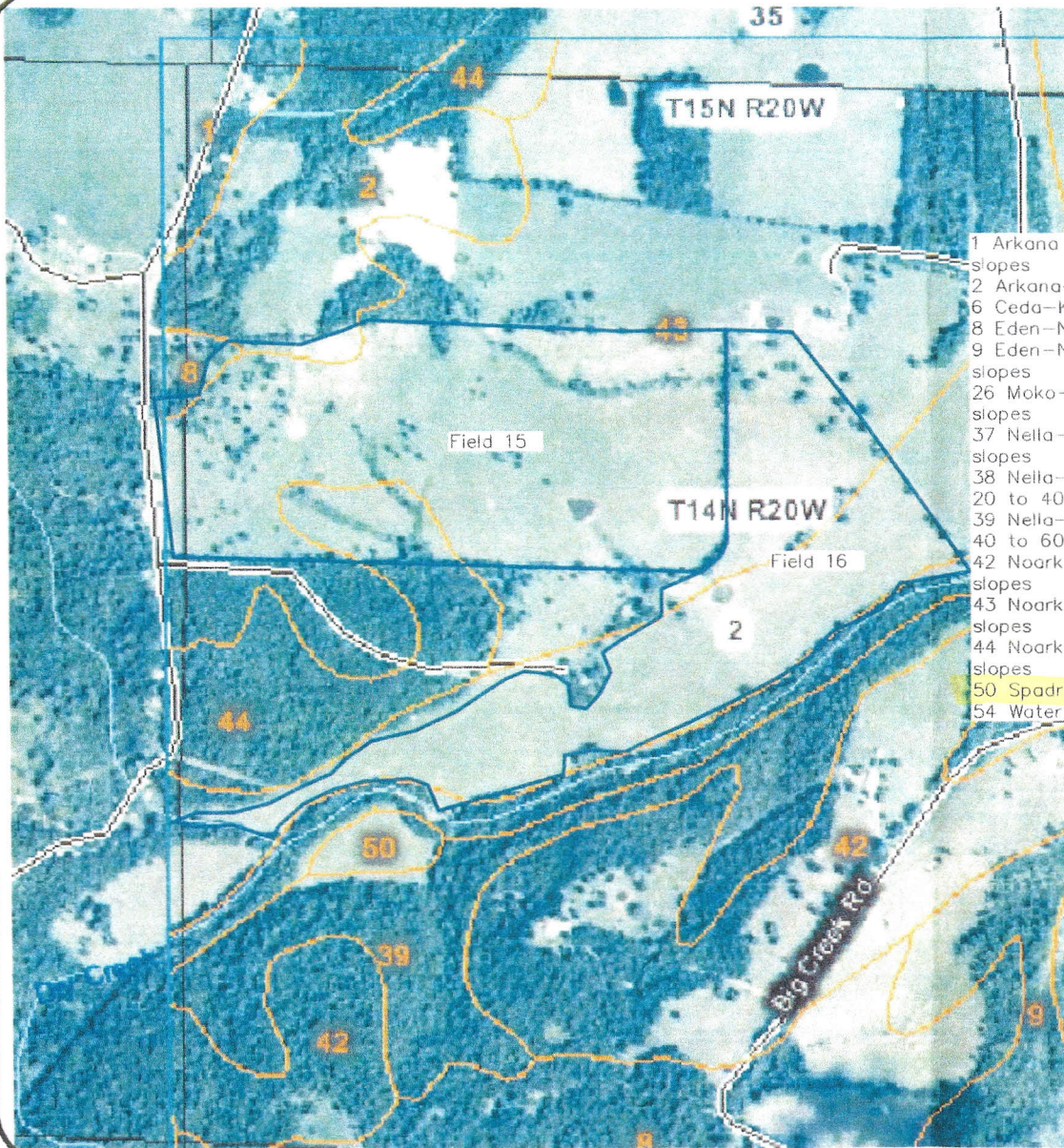
C&H HOG FARMS
 GESTATION-FARROWING FARM

SECTION 26, T 15 N, R 20 W
 NEWTON COUNTY, NE

FIELDS 8-16

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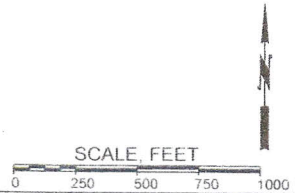
FILE NAME: 05 PROJECT FILES/SHINE/HENSON/GFES/PLAN



LEGEND

- 1 Arkana very cherty silt loam, 3 to 8 percent slopes
- 2 Arkana-Moko complex, 8 to 20 percent slopes
- 6 Ceda-Kenn complex, frequently flooded
- 8 Eden-Newnata complex, 8 to 20 percent slopes
- 9 Eden-Newnata complex, 20 to 40 percent slopes
- 26 Moko-Rock outcrop complex, 15 to 50 percent slopes
- 37 Nella-Steprock complex, 8 to 20 percent slopes
- 38 Nella-Steprock-Mountainburg very stony loams, 20 to 40 percent slopes
- 39 Nella-Steprock-Mountainburg very stony loams, 40 to 60 percent slopes
- 42 Noark very cherty silt loam, 3 to 8 percent slopes
- 43 Noark very cherty silt loam, 8 to 20 percent slopes
- 44 Noark very cherty silt loam, 20 to 40 percent slopes
- 50 Spadra loam, occasionally flooded
- 54 Water

GENERAL NOTES



| No. | Revision/Issue | Date |
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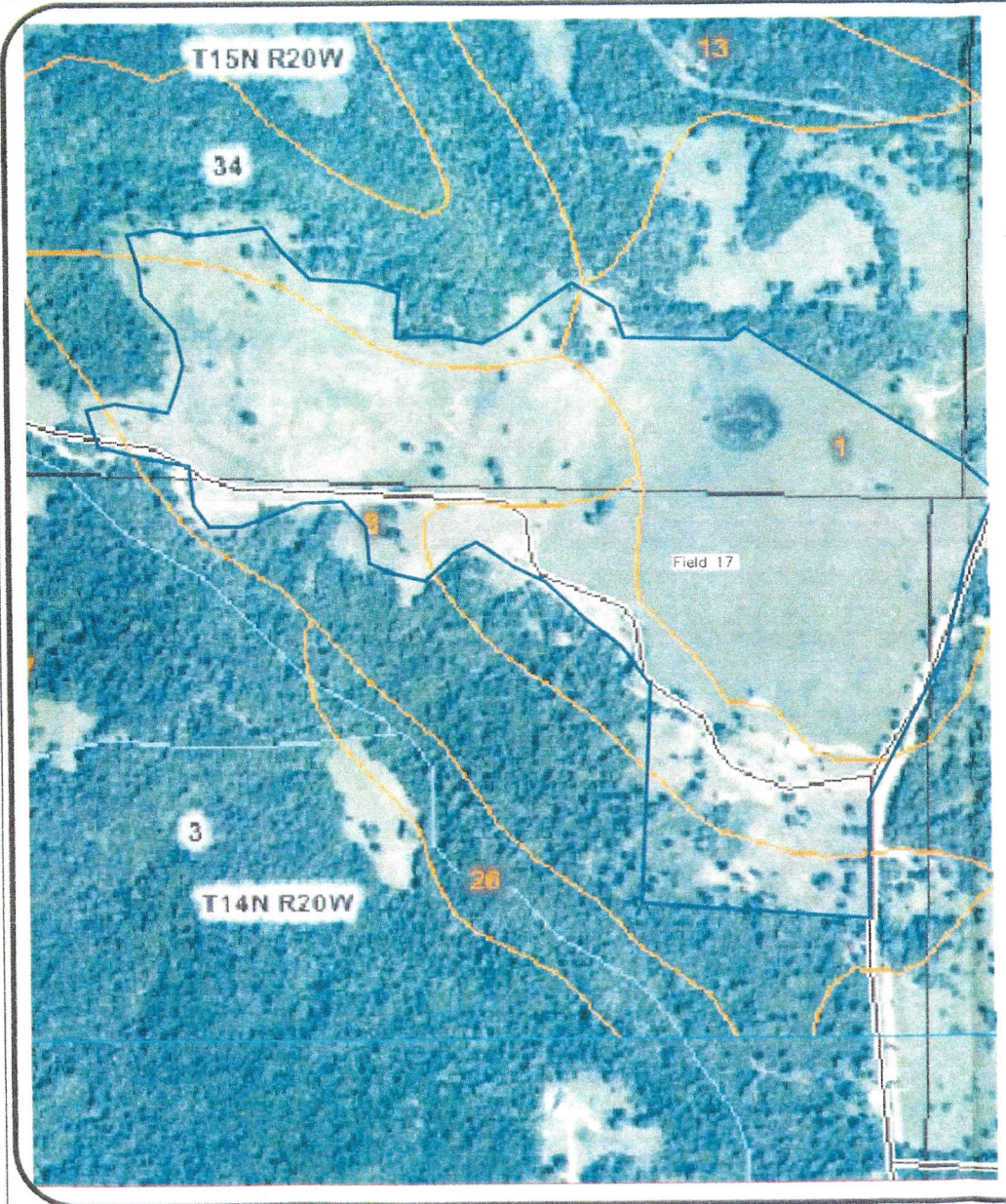
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C&H HOG FARMS
 GESTATION-FARROWING FARM

SECTION 5, T 14 N, R 20 W
 NEWTON COUNTY, AR

FIELDS 15-16

| | |
|-----------------------|-----------------|
| DATE: MAY 29, 2012 | SHEET: 4 |
| SCALE: 1" = 500' | |
| DRAWN BY: NAP | |
| CHECKED BY: DLD | |



LEGEND

- 1 Arkana very cherty silt loam, 3 to 8 percent slopes
- 2 Arkana-Moko complex, 8 to 20 percent slopes
- 8 Eden-Newnata complex, 8 to 20 percent slopes
- 13 Enders stony loam, 3 to 20 percent slopes
- 26 Moko-Rock outcrop complex, 15 to 50 percent slopes
- 36 Nella-Enders stony loams, 20 to 40 percent slopes
- 37 Nella-Steprock complex, 8 to 20 percent slopes
- 39 Nella-Steprock-Mountainburg very stony loams, 40 to 60 percent slopes
- 43 Noark very cherty silt loam, 8 to 20 percent slopes
- 44 Noark very cherty silt loam, 20 to 40 percent slopes

GENERAL NOTES



SCALE FEET



| No. | Revision/Issue | Date |
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C&H HOG FARMS
 GESTATION-FARROWING FARM

SECTION 3, T 14 N, R 20 W
 NEWTON COUNTY, AR

FIELD 17

| | |
|--------------------|--------|
| DATE: MAY 29, 2012 | SHEET: |
| SCALE: 1" = 500' | 5 |
| DRAWN BY: NAP | |
| CHECKED BY: DLD | |

FILE NAME: 05 PROJECT FILES/SWIRL/NEWTON/FILES/PLAN

ATTACHMENT 4

Comments:

Arkansas Nutrient Management 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 | | |

This worksheet is intended to assist in the writing of Nutrient Management Plans for the application of manure to pasture and hay land. To do this, the worksheet estimates the litter production for the farm, estimates the P Index risk value for the defined conditions of each field, assists with the allocation of nutrients to the various receiving fields, and estimates the amount of litter available for off farm use. This worksheet is the result of an effort to develop a reliable training/planning tool faithful to the 2009 Arkansas P Index developed by a multi-agency effort. However, no guarantees are made, and any observed problems or suggestions for improvement should be directed to Karl VanDevender at kvan@uaex.edu.

County Information

| | |
|------------------------|--------|
| Farm county | Newton |
| R | 270 |
| 10-Yr EI | 110 |
| Kf adjusted for frost? | Yes |

Nutrient Source and Description Information

| Manure Source | Source Type | Amount Available | | N Concentration | | P2O5 Concentration | | K2O Concentration | | Water Extractible P | | Alum Used? |
|---------------|------------------|------------------|----------|-----------------|-------------|--------------------|-------------|-------------------|-------------|---------------------|-------------|------------|
| | | | | | | | | | | | | |
| WSP#1 | Liquid Biosolids | 1230 | 1000 gal | 37.60 | lb/1000 gal | 28.90 | lb/1000 gal | 29.10 | lb/1000 gal | 1.90 | lb/1000 gal | No |
| WSP#2 | Liquid Manure | 1531 | 1000 gal | 30.20 | lb/1000 gal | 23.20 | lb/1000 gal | 23.40 | lb/1000 gal | 0.07 | lb/1000 gal | No |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Nutrient Loss and Mineralization Factors

| Nutrient Source Description | N | | P2O5 | | K2O | |
|-----------------------------|--------------------|------------------|--------------------|------------------|--------------------|------------------|
| | Storage Losses (%) | Appl. Losses (%) | Storage Losses (%) | Appl. Losses (%) | Storage Losses (%) | Appl. Losses (%) |
| WSP#1 | 60% | 50% | 80% | | 80% | |
| WSP#2 | 60% | 50% | 80% | | 80% | |
| | | | | | | |
| | | | | | | |

Estimated Plant Available Nutrients

| Nutrient Source Description | N | | P2O5 | | K2O | | Water Extractible P | |
|-----------------------------|------------------|------------|------------------|------------|------------------|------------|---------------------|------------|
| | Concentration | Total (lb) | Concentration | Total (lb) | Concentration | Total (lb) | Concentration | Total (lb) |
| WSP#1 | 7.52 lb/1000 gal | 9,250 | 5.78 lb/1000 gal | 7,109 | 5.82 lb/1000 gal | 7,159 | 1.90 lb/1000 gal | 2337 |
| WSP#2 | 6.04 lb/1000 gal | 9,247 | 4.64 lb/1000 gal | 7,104 | 4.68 lb/1000 gal | 7,165 | 0.07 lb/1000 gal | 107.17 |
| | | | | | | | | |
| | | | | | | | | |
| Totals | | 18,497 | | 14,213 | | 14,324 | | 2,444 |

Field P Index Calculations

| Field | Soil Test P | | Soil Map Unit | Slope Gradient (%) | | | | Slope Length (ft) | | | | Flooding Frequency |
|-------|-------------|-------|---------------|--------------------|-----|-----|------|-------------------|-----|-----|------|--------------------|
| | ppm | lb/ac | | Min | Max | Rep | Used | Min | Max | Rep | Used | |
| | | | | | | | | | | | | |

Comments

Arkansas Nutrient Management 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 | | |

| | | | | | | | | | | | | |
|-----|-----|-----|----|------|------|------|-----|------|------|------|----|------------|
| H1 | 83 | 110 | 42 | 3 | 8 | 5 | 5.5 | 15 | 75 | 45 | 45 | None |
| H2 | 72 | 96 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 45 | None |
| H3 | 42 | 56 | 48 | 0 | 3 | 2 | 14 | 15 | 75 | 45 | 23 | Occasional |
| H4 | 50 | 67 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 23 | None |
| H5 | 65 | 86 | 48 | #N/A | #N/A | #N/A | 0.2 | #N/A | #N/A | #N/A | 5 | #N/A |
| H6 | 76 | 101 | 48 | #N/A | #N/A | #N/A | 0.2 | #N/A | #N/A | #N/A | 4 | #N/A |
| H7 | 178 | 237 | 48 | #N/A | #N/A | #N/A | 0.2 | #N/A | #N/A | #N/A | 4 | #N/A |
| H8 | 46 | 61 | 51 | 2 | 5 | 2.5 | 3.5 | 15 | 75 | 45 | 12 | None |
| H9 | 52 | 69 | 50 | #N/A | #N/A | #N/A | 0.2 | #N/A | #N/A | #N/A | 7 | #N/A |
| H10 | 69 | 92 | 51 | 2 | 5 | 2.5 | 3.5 | 15 | 75 | 45 | 15 | None |

| Field | Field Area (ac) | Buffer Length (ft) | Buffer Width (ft) | Appl Area (ac) | Predominate Vegetation | Percent Ground Cover | Conservation Support Practices (P) | RUSLE 1 (ton/ac) | RUSLE 2 (ton/ac) |
|-------|-----------------|--------------------|-------------------|----------------|------------------------|----------------------|------------------------------------|------------------|------------------|
| H1 | 19.70 | 1,800 | 100 | 15.57 | Grass | 95-100 | None in place | 0.12 | 0.18 |
| H2 | 19.30 | 1,000 | 100 | 17.00 | Grass | 95-100 | None in place | 0.34 | 6.60 |
| H3 | 15.90 | 1,000 | 100 | 13.60 | Grass | 95-100 | None in place | 0.24 | 0.01 |
| H4 | 10.40 | 700 | 100 | 8.79 | Grass | 95-100 | None in place | 0.28 | 5.40 |
| H5 | 24.90 | 500 | 100 | 23.75 | Grass | 95-100 | None in place | | 0.05 |
| H6 | 36.60 | 900 | 100 | 34.53 | Grass | 95-100 | None in place | | 0.05 |
| H7 | 79.80 | 2,400 | 100 | 74.29 | Grass | 95-100 | None in place | | 1.10 |
| H8 | 15.50 | | | 15.50 | Grass | 95-100 | None in place | 0.06 | 1.30 |
| H9 | 45.10 | 1,680 | 100 | 41.24 | Grass | 95-100 | None in place | | 0.49 |
| H10 | 34.30 | 500 | 100 | 33.15 | Grass | 95-100 | None in place | 0.06 | 1.30 |

302

277

| Field | Pasture Use | Application Method | Application Timing | Nutrient Source | Application Rate | | Pre BMP PI Value | P Index Range | Target Post BMPs PI Values |
|-------|--------------------|--------------------|--------------------|-----------------|------------------|-------------|------------------|---------------|----------------------------|
| H1 | Rotational Grazing | Surface Applied | March-June | WSP#1 | 25.00 | 1000 gal/ac | 65 | Medium | |
| H2 | Rotational Grazing | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 80 | High | |
| H3 | Hayland | Surface Applied | March-June | WSP#1 | 10.00 | 1000 gal/ac | 47 | Medium | |
| H4 | Rotational Grazing | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 75 | High | |
| H5 | Hayland | Surface Applied | March-June | WSP#2 | 81.00 | 1000 gal/ac | | | |
| H6 | Hayland | Surface Applied | March-June | WSP#2 | 81.00 | 1000 gal/ac | | | |
| H7 | Hayland | Surface Applied | March-June | WSP#2 | 81.00 | 1000 gal/ac | | | |
| H8 | Hayland | Surface Applied | March-June | WSP#2 | 81.00 | 1000 gal/ac | 56 | Medium | |
| H9 | Hayland | Surface Applied | March-June | WSP#2 | 81.00 | 1000 gal/ac | | | |
| H10 | Hayland | Surface Applied | March-June | WSP#1 | 18.00 | 1000 gal/ac | 52 | Medium | |

Comments:

Arkansas Nutrient Management 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 Borders | 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 |

Comments:

Arkansas Nutrient Management 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 Management 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 | | | | | | | | | | |
| Rusle LS | 0.44 | 1.2 | 0.98 | 0.98 | 0.05 | 0.05 | 0.05 | 0.26 | 0.05 | 0.26 | |
| Vegetal Canopy: Type | Grass | Grass | Grass | Grass | Grass | Grass | Grass | Grass | Grass | Grass | |
| Percent of Ground Coverd | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | |
| C Factor | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | |
| Cons. Support Practices (P) | None in place | None in place | None in place | None in place | None in place | None in place | None in place | None in place | None in place | None in place | |
| Calc. P Factor? | No | No | No | No | No | No | No | No | No | No | |
| Soil Hydrologic Group | B | B | B | B | | | | B | | B | |
| EI | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 | |
| P Factor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| RUSLE 1 (ton/ac) | 0.12474 | 0.3402 | 0.23814 | 0.27783 | | | | 0.06318 | | 0.06318 | |
| RUSLE 2 (ton/ac) | 0.18 | 6.6 | 0.0061 | 5.4 | 0.05 | 0.05 | 1.1 | 1.3 | 0.49 | 1.3 | |
| RUSLE ? Used (ton/ac) | 0.18 | 6.6 | 0.0061 | 5.4 | 0.05 | 0.05 | 1.1 | 1.3 | 0.49 | 1.3 | |
| Soil Erosion LRV | 0 | 1 | 0 | 1 | 0 | 0 | 0.1 | 0.1 | 0 | 0.1 | |
| Pasture Use | Rotational G | Rotational G | Hayland | Rotational G | Hayland | Hayland | Hayland | Hayland | Hayland | Hayland | |
| Runoff Curve Numbers | 61 | 61 | 58 | 61 | | | | 58 | | 58 | |
| Soil Runoff Class | VL | L | N | L | | | | N | | N | |
| Soil Runoff Class LRV | 0.15 | 0.2 | 0.1 | 0.2 | | | | 0.1 | | 0.1 | |
| Flooding Frequency | None | None | Occasional | None | #N/A | #N/A | #N/A | None | #N/A | None | |
| Flooding Frequency LRV | 0 | 0 | 0.5 | 0 | | | | 0 | | 0 | |
| Application Method | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | |
| Application Method LRV | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | |
| Application Timing | March-June | March-June | March-June | March-June | March-June | March-June | March-June | March-June | March-June | March-June | |
| Application Timing LRV | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | |
| Total P Transport Value | 0.6 | 1.65 | 1.05 | 1.65 | | | | 0.65 | | 0.65 | |
| Calc PI | 0 | 0 | 0 | 0 | 9 | 9 | 9 | 0 | 9 | 0 | |
| Pre BMP PI Value | 65 | 80 | 47 | 75 | | | | 56 | | 52 | |
| PI Range | Medium | High | Medium | High | | | | Medium | | Medium | |
| Diversion % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Terrace % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pond % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Filter Strip % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Grassed WaterWay % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Fencing % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Riparian Forst Buffer % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Riparian Herbaceous Buffer % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Field Borderrs % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total SMV | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Post BMP PI Value | 65 | 80 | 47 | 75 | | | | 56 | | 52 | |
| PI Range | Medium | High | Medium | High | | | | Medium | | Medium | |

Comments:

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

| | | | |
|-------------------|-----------------------------|-------|-----------|
| Planner: | | Date: | 5/25/2012 |
| Plan Description: | C&H Hog Farms: Fields 11-17 | | |

This worksheet is intended to assist in the writing of Nutrient Management Plans for the application of manure to pasture and hay land. To do this, the worksheet estimates the litter production for the farm, estimates the P Index risk value for the defined conditions of each field, assists with the allocation of nutrients to the various receiving fields, and estimates the amount of litter available for off farm use. This worksheet is the result of an effort to develop a reliable training/planning tool faithful to the 2009 Arkansas P Index developed by a multi-agency effort. However, no guarantees are made, and any observed problems or suggestions for improvement should be directed to Karl VanDevender at kvan@uaex.edu

County Information

| | |
|------------------------|--------|
| Farm county | Newton |
| R | 270 |
| 10-Yr EI | 110 |
| Kf adjusted for frost? | Yes |

Nutrient Source and Description Information

| Manure Source | Source Type | Amount Available | | N Concentration | | P2O5 Concentration | | K2O Concentration | | Water Extractible P | | Alum Used? |
|---------------|------------------|------------------|----------|-----------------|-------------|--------------------|-------------|-------------------|-------------|---------------------|-------------|------------|
| | | | | | | | | | | | | |
| WSP#1 | Liquid Biosolids | 1230 | 1000 gal | 37.60 | lb/1000 gal | 28.90 | lb/1000 gal | 29.10 | lb/1000 gal | 1.90 | lb/1000 gal | No |
| WSP#2 | Liquid Manure | 1531 | 1000 gal | 30.20 | lb/1000 gal | 23.20 | lb/1000 gal | 23.40 | lb/1000 gal | 0.70 | lb/1000 gal | No |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Nutrient Loss and Mineralization Factors

| Nutrient Source Description | N | | P2O5 | | K2O | |
|-----------------------------|--------------------|-----------------|--------------------|-----------------|--------------------|-----------------|
| | Storage Losses (%) | Appl Losses (%) | Storage Losses (%) | Appl Losses (%) | Storage Losses (%) | Appl Losses (%) |
| WSP#1 | 60% | 50% | 80% | | 80% | |
| WSP#2 | 60% | 50% | 80% | | 80% | |
| | | | | | | |
| | | | | | | |

Estimated Plant Available Nutrients

| Nutrient Source Description | N | | P2O5 | | K2O | | Water Extractible P | |
|-----------------------------|------------------|------------|------------------|------------|------------------|------------|---------------------|------------|
| | Concentration | Total (lb) | Concentration | Total (lb) | Concentration | Total (lb) | Concentration | Total (lb) |
| WSP#1 | 7.52 lb/1000 gal | 9,250 | 5.78 lb/1000 gal | 7,109 | 5.82 lb/1000 gal | 7,159 | 1.90 lb/1000 gal | 2,337 |
| WSP#2 | 6.04 lb/1000 gal | 9,247 | 4.64 lb/1000 gal | 7,104 | 4.68 lb/1000 gal | 7,165 | 0.70 lb/1000 gal | 1,071.7 |
| | | | | | | | | |
| | | | | | | | | |
| Totals | | 18,497 | | 14,213 | | 14,324 | | 3,409 |

Field P Index Calculations

| | | | | |
|-------------|----------|--------------------|-------------------|----------|
| Soil Test P | Soil Map | Slope Gradient (%) | Slope Length (ft) | Flooding |
|-------------|----------|--------------------|-------------------|----------|

Comments:

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

| Planner | | Date: 5/25/2012 | | | | | | | | | | |
|------------------|-----|-----------------------------|------|-----|-----|-----|------|-----|-----|-----|------|------------|
| Plan Description | | C&H Hog Farms: Fields 11-17 | | | | | | | | | | |
| Field | ppm | lb/ac | Unit | Min | Max | Rep | Used | Min | Max | Rep | Used | Frequency |
| H11 | 57 | 76 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 20 | None |
| H12 | 19 | 25 | 50 | 0 | 3 | 2 | 2 | 15 | 75 | 45 | 45 | Occasional |
| H13 | 48 | 64 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 20 | None |
| H14 | 52 | 69 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 20 | None |
| H15 | 15 | 20 | 43 | 8 | 20 | 14 | 14 | 15 | 30 | 20 | 20 | None |
| H16 | 48 | 64 | 50 | 0 | 3 | 2 | 2 | 15 | 75 | 45 | 45 | Occasional |
| H17 | 50 | 67 | 1 | 3 | 8 | 5 | 5.5 | 15 | 75 | 45 | 45 | None |

| Field | Field Area (ac) | Buffer Length (ft) | Buffer Width (ft) | Appl Area (ac) | Predominate Vegetation | Percent Ground Cover | Conservation Support Practices (P) | RUSLE 1 (ton/ac) | RUSLE 2 (ton/ac) |
|-------|-----------------|--------------------|-------------------|----------------|------------------------|----------------------|------------------------------------|------------------|------------------|
| H11 | 20.70 | | | 20.70 | Grass | 95-100 | None in place | 0.28 | 5.20 |
| H12 | 28.70 | 2,200 | 100 | 23.65 | Grass | 95-100 | None in place | 0.05 | 0.91 |
| H13 | 66.90 | 2,300 | 100 | 61.62 | Grass | 95-100 | None in place | 0.28 | 5.20 |
| H14 | 18.00 | | | 18.00 | Grass | 95-100 | None in place | 0.28 | 5.20 |
| H15 | 66.30 | 2,300 | 100 | 61.02 | Grass | 95-100 | None in place | 0.28 | 5.20 |
| H16 | 79.60 | | | 79.60 | Grass | 95-100 | None in place | 0.05 | 0.91 |
| H17 | 88.70 | | | 88.70 | Grass | 95-100 | None in place | 0.12 | 1.10 |

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| Field | Pasture Use | Application Method | Application Timing | Nutrient Source | Application Rate | | Pre BMP PI Value | P Index Range | Target Post BMPs PI Values |
|-------|-------------|--------------------|--------------------|-----------------|------------------|-------------|------------------|---------------|----------------------------|
| H11 | Hayland | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 72 | High | |
| H12 | Hayland | Surface Applied | March-June | WSP#1 | 15.00 | 1000 gal/ac | 64 | Medium | |
| H13 | Hayland | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 70 | High | |
| H14 | Hayland | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 71 | High | |
| H15 | Hayland | Surface Applied | March-June | WSP#1 | 9.90 | 1000 gal/ac | 63 | Medium | |
| H16 | Hayland | Surface Applied | March-June | WSP#1 | 14.00 | 1000 gal/ac | 64 | Medium | |
| H17 | Hayland | Surface Applied | March-June | WSP#1 | 18.00 | 1000 gal/ac | 58 | Medium | |

Comments:

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

| | | | |
|------------------|-----------------------------|------|-----------|
| Planner | | Date | 5/25/2012 |
| Plan Description | C&H Hog Farms: Fields 11-17 | | |

Best Management Practices

| Field | Diversion | Terrace | Pond | Filter Strip | Grassed Waterway | Fencing | Riparian Forest Buffer | Riparian Herbaceous Cover | Field Borders | Post BMP PI Value | P Index Range |
|-------|-----------|---------|------|--------------|------------------|---------|------------------------|---------------------------|---------------|-------------------|---------------|
| H11 | | | | | | | | | | 72 | High |
| H12 | | | | | | | | | | 64 | Medium |
| H13 | | | | | | | | | | 70 | High |
| H14 | | | | | | | | | | 71 | High |
| H15 | | | | | | | | | | 63 | Medium |
| H16 | | | | | | | | | | 64 | Medium |
| H17 | | | | | | | | | | 58 | 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 |
| H11 | WSP#1 | 9.90 | 9.90 | 1000 gal/ac | 489 | 57 | 220 | 74 | 57 | 58 | -415 | 0 | -162 |
| H12 | WSP#1 | 15.00 | 15.00 | 1000 gal/ac | 489 | 57 | 220 | 113 | 87 | 87 | -376 | 30 | -133 |
| H13 | WSP#1 | 9.90 | 9.90 | 1000 gal/ac | 489 | 57 | 220 | 74 | 57 | 58 | -415 | 0 | -162 |
| H14 | WSP#1 | 9.90 | 9.90 | 1000 gal/ac | 489 | 57 | 220 | 74 | 57 | 58 | -415 | 0 | -162 |
| H15 | WSP#1 | 9.90 | 9.90 | 1000 gal/ac | 489 | 57 | 220 | 74 | 57 | 58 | -415 | 0 | -162 |
| H16 | WSP#1 | 14.00 | 14.00 | 1000 gal/ac | 489 | 57 | 220 | 105 | 81 | 81 | -384 | 24 | -139 |
| H17 | 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 |
| H11 | WSP#1 | 204.93 | 204.93 | 1000 gal | 10,122 | 1,180 | 4,554 | 1,541 | 1,184 | 1,193 | -8,581 | 5 | -3,361 |
| H12 | WSP#1 | 354.74 | 354.74 | 1000 gal | 11,565 | 1,348 | 5,203 | 2,668 | 2,050 | 2,065 | -8,897 | 702 | -3,138 |
| H13 | WSP#1 | 610.04 | 610.04 | 1000 gal | 30,132 | 3,512 | 13,556 | 4,587 | 3,526 | 3,550 | -25,545 | 14 | -10,006 |
| H14 | WSP#1 | 178.20 | 178.20 | 1000 gal | 8,802 | 1,026 | 3,960 | 1,340 | 1,030 | 1,037 | -7,462 | 4 | -2,923 |
| H15 | WSP#1 | 604.10 | 604.10 | 1000 gal | 29,839 | 3,478 | 13,424 | 4,543 | 3,492 | 3,516 | -25,296 | 14 | -9,909 |
| H16 | WSP#1 | 1114.40 | 1114.40 | 1000 gal | 38,924 | 4,537 | 17,512 | 8,380 | 6,441 | 6,486 | -30,544 | 1,904 | -11,026 |
| H17 | WSP#1 | 1596.60 | 1596.60 | 1000 gal | 43,374 | 5,056 | 19,514 | 12,006 | 9,228 | 9,292 | -31,368 | 4,172 | -10,222 |

Comments:

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

| | | | | | | | | | |
|------------------|-----------------------------|--------|-----------|--------|--------|--------|----------|-------|---------|
| Planner | | Date | 5/25/2012 | | | | | | |
| Plan Description | C&H Hog Farms. Fields 11-17 | | | | | | | | |
| Totals | 172,758 | 20,137 | 77,724 | 35,066 | 26,952 | 27,139 | -137,693 | 6,815 | -50,585 |

Comments

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

| | | | |
|------------------|-----------------------------|------|-----------|
| Planner | | Date | 5/25/2012 |
| Plan Description | C&H Hog Farms: Fields 11-17 | | |

Manure Distribution Summary

Units Applied by Field and Source

| Field | Source | | | |
|-----------------|---------------------|---------------------|--|--|
| | WSP#1 (1000 gal) | WSP#2 (1000 gal) | | |
| H11 | 204.93 | | | |
| H12 | 354.74 | | | |
| H13 | 610.04 | | | |
| H14 | 178.20 | | | |
| H15 | 604.10 | | | |
| H16 | 1,114.40 | | | |
| H17 | 1,596.60 | | | |
| Total Applied | 4,663 | | | |
| Available | 1,230 | 1531 | | |
| Deficit/Surplus | -3,433 | | | |

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

| Field | H11 | H12 | H13 | H14 | H15 | H16 | H17 | | | | | | |
|-------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|--|--|--|--|--|
| Soil Map Unit | 43 | 50 | 43 | 43 | 43 | 50 | 1 | | | | | | |
| Soil Name | Noark very c | Spadra loam | Noark very c | Noark very c | Noark very c | Spadra loam | Arkana very | | | | | | |
| Primary Litter Source | WSP#1 | WSP#1 | WSP#1 | WSP#1 | WSP#1 | WSP#1 | WSP#1 | | | | | | |
| Source Type | Liquid Biosol | Liquid Biosol | Liquid Biosol | Liquid Biosol | Liquid Biosol | Liquid Biosol | Liquid Biosol | | | | | | |
| WEP (lb/ton) | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | | | | | | |
| TP Used (lb/ton) | 12.6200873 | 12.6200873 | 12.6200873 | 12.6200873 | 12.6200873 | 12.6200873 | 12.6200873 | | | | | | |
| Litter Appl. Rate (tons/acre) | 9.9 | 15 | 9.9 | 9.9 | 9.9 | 14 | 18 | | | | | | |
| WEP rate (lb/ac) | 18.81 | 28.5 | 18.81 | 18.81 | 18.81 | 26.6 | 34.2 | | | | | | |
| TP rate (lb/ac) | 124.938865 | 169.30131 | 124.938865 | 124.938865 | 124.938865 | 176.681223 | 227.161572 | | | | | | |
| Alum Used | No | No | No | No | No | No | No | | | | | | |
| Mineralization Coef | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | |
| WEP coef | 0.029 | 0.029 | 0.029 | 0.029 | 0.029 | 0.029 | 0.029 | | | | | | |
| WEP Source Value | 0.69937685 | 1.0596619 | 0.69937685 | 0.69937685 | 0.69937685 | 0.98901777 | 1.27159428 | | | | | | |
| Soil Test P | 75.81 | 25.27 | 63.84 | 69.16 | 19.95 | 63.84 | 66.5 | | | | | | |
| Soil coef | 0.0018 | 0.0018 | 0.0018 | 0.0018 | 0.0018 | 0.0018 | 0.0018 | | | | | | |
| Soil P Source Value | 0.136458 | 0.045486 | 0.114912 | 0.124488 | 0.03591 | 0.114912 | 0.1197 | | | | | | |
| Total P Source Value | 0.83583485 | 1.1051479 | 0.81428885 | 0.82386485 | 0.73528685 | 1.10392977 | 1.39129428 | | | | | | |
| R factor | 270 | 270 | 270 | 270 | 270 | 270 | 270 | | | | | | |
| Kf | 0.43 | 0.37 | 0.43 | 0.43 | 0.43 | 0.37 | 0.43 | | | | | | |
| Adj Kf For Freezing? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Kf Used | 0.35 | 0.3 | 0.35 | 0.35 | 0.35 | 0.3 | 0.35 | | | | | | |

Comments:

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

| | | | | | | | | | |
|------------------------------|-----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|------|-----------|
| Planner | | | | | | | | Date | 5/25/2012 |
| Plan Description | C&H Hog Farms. Fields 11-17 | | | | | | | | |
| Slope Gradient (%) | 14 | 2 | 14 | 14 | 14 | 2 | 5.5 | | |
| Slope Length (ft) | 20 | 45 | 20 | 20 | 20 | 45 | 45 | | |
| Rusle LS | 0.98 | 0.21 | 0.98 | 0.98 | 0.98 | 0.21 | 0.44 | | |
| Vegetal Canopy Type | Grass | Grass | Grass | Grass | Grass | Grass | Grass | | |
| Percent of Ground Coverd | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | 95-100 | | |
| C Factor | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | | |
| Cons. Support Practices (P) | None in place | None in place | None in place | None in place | None in place | None in place | None in place | | |
| Calc. P Factor? | No | No | No | No | No | No | No | | |
| Soil Hydrologic Group | B | B | B | B | B | B | C | | |
| EI | 110 | 110 | 110 | 110 | 110 | 110 | 110 | | |
| P Factor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| RUSLE 1 (ton/ac) | 0.27783 | 0.05103 | 0.27783 | 0.27783 | 0.27783 | 0.05103 | 0.12474 | | |
| RUSLE 2 (ton/ac) | 5.2 | 0.91 | 5.2 | 5.2 | 5.2 | 0.91 | 1.1 | | |
| RUSLE ? Used (ton/ac) | 5.2 | 0.91 | 5.2 | 5.2 | 5.2 | 0.91 | 1.1 | | |
| Soil Erosion LRV | 1 | 0 | 1 | 1 | 1 | 0 | 0.1 | | |
| Pasture Use | Hayland | Hayland | Hayland | Hayland | Hayland | Hayland | Hayland | | |
| Runoff Curve Numbers | 58 | 58 | 58 | 58 | 58 | 58 | 71 | | |
| Soil Runoff Class | N | N | N | N | N | N | L | | |
| Soil Runoff Class LRV | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | | |
| Flooding Frequency | None | Occasional | None | None | None | Occasional | None | | |
| Flooding Frequency LRV | 0 | 0.5 | 0 | 0 | 0 | 0.5 | 0 | | |
| Application Method | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | Surface Appl | | |
| Application Method LRV | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | | |
| Application Timing | March-June | March-June | March-June | March-June | March-June | March-June | March-June | | |
| Application Timing LRV | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | | |
| Total P Transport Value | 1.55 | 1.05 | 1.55 | 1.55 | 1.55 | 1.05 | 0.75 | | |
| Calc PI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pre BMP PI Value | 72 | 64 | 70 | 71 | 63 | 64 | 58 | | |
| PI Range | High | Medium | High | High | Medium | Medium | Medium | | |
| Diversion % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Terrace % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pond % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Filter Strip % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Grassed WaterWay % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Fencing % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Riparian Forst Buffer % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Riparian Herbaceous Buffer % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Field Borderrs % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Total SMV | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Post BMP PI Value | 72 | 64 | 70 | 71 | 63 | 64 | 58 | | |
| PI Range | High | Medium | High | High | Medium | Medium | Medium | | |

ATTACHMENT 5

References

The nutrient management plan was developed based on compliance criteria described in the following documents:

- Arkansas Pollution Control and Ecology Commission Regulation 5 dated March 28, 2008
- USDA, Natural Resources Conservation Service (NRCS) conservation practice standard Nutrient Management ("590") dated December 2004
- _____ County zoning ordinance for animal feeding operations dated/amended

Land Base

The nutrient management plan has sufficient land base to meet land application on a Nitrogen (N)-based for fields 5-9. Fields 1-4 and 10-17 are in addition and will be applied on a Phosphorus (P)-based manure application rate. P-based levels for spreading manure generally requires a significantly greater land base the N-based. When necessary, fields targeted for phosphorus-based manure application are identified in the Manure Application Planning section of this plan.

ATTACHMENT 6



C&H Hog Farm

Concentrated Animal Feeding Operations

ADEQ

ARKANSAS
Department of Environmental Quality



Coverage Requirements

Operators of CAFOs seeking coverage must submit the following:

- a Notice of Intent (NOI).
- a Nutrient Management Plan (NMP) that meets the requirements of 40 CFR 122 and 412 that have been developed in accordance with Natural Resource Conservation Service Practice Standard Code 590 (Nutrient Management), including the Arkansas Phosphorous Index, 2010 Revision.
- ADEQ Disclosure Statement
- Initial permit fee of \$200



Land Application Requirements

- Minimize nutrient runoff using Arkansas Phosphorus Index
 - Source potential (i.e. P from the soil and manure)
 - Transport potential (i.e. risk P movement offsite as affected by runoff and erosion, field slope, grazing intensity and proximity to streams)
- Developed by the University of Arkansas Extension Services.

ATTACHMENT 7

Section B: Nutrient Utilization Plan

B. NUTRIENT UTILIZATION PLAN

The Following is in this section:

1. Location
2. Record Keeping
3. Soil Sampling
4. Manure Sampling
5. Nutrient Budget for Land Application
6. Timing, Rate, and Frequency of Liquid and Solid Manure Applications
7. Land Application of Liquid Manure
8. Amounts of Nitrogen Applied
9. Solid Accumulation in the Retention Storage Pond
10. Check Valves/Safety Switches
11. Effluent/Solids Easement Agreement
12. Prevention of Destruction of Endangered or Threatened Species
13. Setback Requirements
14. Typical Crops Grown and Crop Yields for the Land Application Areas
15. Nutrient Utilization Plan Amendments

- a. Liquid manure will typically be applied at agronomic rates for nitrogen, however, the phosphorus application will follow the Arkansas Nutrient Management Planner phosphorous index risk assessment to ensure that the phosphorus levels are not becoming a risk to surface water pollution.
- b. Calculations for quantity of liquid manure that can be applied to agronomic rates to crop production land are performed by the staff soil scientist or or land application formulas prepared by University of Arkansas Extension.
- c. $\text{Max. application (lbs/ac) / Manure N Content (lbs/ac-in)} = \text{Max. manure application (ac-in)}$.
- d. $\text{Acres for application} \times \text{Max. manure application (ac-in)} \times 27154 = \text{Max. pumping volume (gallons)}$.
- e. The spreadsheet log for land application can be utilized for land application calculations.

9. Solid Accumulation in the Retention Storage Pond.

- a. The design and operation of the waste storage pond at the facility provides for desludging during each waste removal.
- b. If or when pond desludging becomes necessary, Jason Henson- will land apply the solids at agronomic rates and in accordance with local, state, and federal regulations.

- c. Solids will be land farmed utilizing available technology at the time of application.
10. **Check Valves/Safety Switches**
 - With the utilization of subsoil land application equipment, the use of check valves/safety switches are not necessary.
 11. **Effluent/Solids Easement Agreement.**

Easements are found in Section G
 12. **Prevention of Destruction of Endangered or Threatened Species.**
 - a. Animal manure handling, treatment and management plans are designed with the intention of reducing any harm or destruction of endangered or threatened species or contribute to the taking of any federally endangered or threatened species of plant, fish, or wildlife; nor interfere with or cause harm to migratory birds.
 - b. C&H Hog Farms will notify the appropriate fish and wildlife agency in the event of any significant fish, wildlife, or migratory bird/endangered species kill or die-off on or near a retention pond or in the field where waste has been applied and which could reasonably have resulted from waste management at the facility.
 13. **Setback Requirements.**
 - a. Manure shall not be applied any closer than a 100 feet to any down-gradient surface waters, open tile line intake structures, sinkholes, agricultural well heads or other conduits to surface waters.
 - b. Incorporate surface applications of solid forms of manure or some commercial fertilizer nitrogen formulations (i.e. Urea) into the soil within 24 hours of application.
 - c. When applying liquid forms of manure with irrigation equipment select application conditions when there is high humidity, little/no wind blowing, a forth coming rainfall event, and or other conditions that will minimize volatilization losses into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plans.
 14. **Typical Crops Grown and Crop Yields for the Land Application Areas:**
 - a. Pasture – 6.5 tons/acre
 - b. Hay - 6.5 tons/acres

ATTACHMENT 8



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*** Legislation is current through the 2012 Fiscal Session and updates ***
*** received from the Arkansas Code Revision Commission through ***

*** August 1, 2012. ***

*** Annotations are current through July 3, 2012. ***

Title 8 Environmental Law
Chapter 4 Arkansas Water and Air Pollution Control Act
Subchapter 2 -- Water Pollution

A.C.A. § 8-4-204 (2012)

8-4-204. Permits -- Revocation.

The Arkansas Department of Environmental Quality or its successor is given and charged with the power and duty to revoke, modify, or suspend, in whole or in part, for cause any permit issued under this chapter, including, without limitation:

- (1) Violation of any condition of the permit;
- (2) Obtaining a permit by misrepresentation or failure to disclose fully all relevant facts; or
- (3) A change in any applicable regulation or a change in any preexisting condition affecting the nature of the discharge that requires either a temporary or permanent reduction or elimination of the permitted discharge.

HISTORY: Acts 1949, No. 472, [Part 1], § 3; 1975, No. 743, § 4; A.S.A. 1947, § 82-1904; Acts 1993, No. 163, § 14; 1993, No. 165, § 14; 1997, No. 1219, § 5; 1999, No. 1164, § 21.

ATTACHMENT 9

PART 6 GENERAL CONDITIONS

6.1 Duty To Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Federal Clean Water Act and the Arkansas Water and Air Pollution Control Act and is grounds for enforcement action or for requiring a permittee to apply for an individual NPDES permit.

6.2 Penalties for Violations of Permit Conditions

The Arkansas Water and Air Pollution Control Act provides that any person who violates any provisions of a permit issued under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year, or a fine of not more than twenty-five thousand dollars (\$25,000) or by both such fine and imprisonment for each day of such violation. Any person who violates any provision of a permit issued under the Act may also be subject to civil penalty in such amount as the court shall find appropriate, not to exceed ten thousand dollars (\$10,000) for each day of such violation. The fact that any such violation may constitute a misdemeanor shall not be a bar to the maintenance of such civil action.

6.3 Permit Actions

In accordance with 40 CFR Parts 122.62 (a)(2) and 124.5, this permit may be reopened for modification or revocation and/or reissuance to require additional monitoring and/or effluent limitations when new information is received that actual or potential exceedance of State water quality criteria and/or narrative criteria are determined to be the result of the permittee's discharge(s) to a relevant water body or a Total Maximum Daily Load (TMDL) is established or revised for the water body that was not available at the time of the permit issuance that would have justified the application of different permit conditions at the time of permit issuance.

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:

- a. Violation of any terms or conditions of this permit; or
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
- c. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.
- d. Failure of the permittee to comply with the provisions of Reg. 9 (Permit fees) as required by Part II.A.8. herein.

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6.4 Toxic Pollutants

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Reg. 2, as amended, (regulation establishing water quality standards for surface waters of the State of Arkansas) or Section 307(a)