

**State of North Carolina**  
**Department of Environment and Natural Resources**  
**Division of Water Quality**  
**Animal Feeding Operations Permit Application Form**  
*(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)*  
**NPDES General Permit - Existing Animal Waste Operations**

**RECEIVED/DENR/DWQ**  
**MAR 19 2012**  
**Aquifer Protection Section**

**1. GENERAL INFORMATION:**

- 1.1 Facility name: Dixie Cops, Inc. PM Farm
- 1.2 Print Land Owner's name: Dixie Chops, Inc.
- 1.3 Mailing address: 187 Dixie Chops Lane  
 City, State: Clinton, NC Zip: 28328  
 Telephone number (include area code): ( 910 ) 592 - 1799
- 1.4 Physical address: 187 Dixie Chops Lane  
 City, State: Clinton, NC Zip: 28328  
 Telephone number (include area code): ( 910 ) 592 - 1799
- 1.5 County where facility is located: Sampson
- 1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): Off US 701, 7.5 miles south of Clinton on right on Dixie Chops Lane
- 1.7 Farm Manager's name (if different from Land Owner): \_\_\_\_\_
- 1.8 Lessee's /Integrator's name (if applicable; circle which type is listed): Murphy-Brown
- 1.9 Facility's original start-up date: ~1978 Date(s) of facility expansion(s) (if applicable): \_\_\_\_\_

**2. OPERATION INFORMATION:**

2.1 Facility number: 82-143

2.2 Operation Description:

Please enter the Design Capacity of the system. The "No. of Animals" should be the maximum number for which the waste management structures were designed.

<u>Type of Swine</u>	<u>No. of Animals</u>	<u>Type of Poultry</u>	<u>No. of Animals</u>	<u>Type of Cattle</u>	<u>No. of Animals</u>
<input type="checkbox"/> Wean to Feeder	_____	<input type="checkbox"/> Layer	_____	<input type="checkbox"/> Beef Brood Cow	_____
<input checked="" type="checkbox"/> Feeder to Finish	<u>2950</u> ✓	<input type="checkbox"/> Non-Layer	_____	<input type="checkbox"/> Beef Feeder	_____
<input type="checkbox"/> Farrow to Wean (# sow)	_____	<input type="checkbox"/> Turkey	_____	<input type="checkbox"/> Beef Stocker Calf	_____
<input type="checkbox"/> Farrow to Feeder (# sow)	_____	<input type="checkbox"/> Turkey Poults	_____	<input type="checkbox"/> Dairy Calf	_____
<input type="checkbox"/> Farrow to Finish (# sow)	_____			<input type="checkbox"/> Dairy Heifer	_____
<input type="checkbox"/> Wean to Finish (# sow)	_____			<input type="checkbox"/> Dry Cow	_____
<input type="checkbox"/> Gilts	_____			<input type="checkbox"/> Milk Cow	_____
<input type="checkbox"/> Boar/Stud	_____				
<input type="checkbox"/> Other Type of Livestock on the farm:	_____				

No. of Animals: \_\_\_\_\_

2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): 29.55 Required Acreage (as listed in the CAWMP): 29.55

2.4 Number of lagoons: 1 Total Capacity (cubic feet): 572,756 Required Capacity (cubic feet): 566,595  
Number of Storage Ponds: \_\_\_\_\_ Total Capacity (cubic feet): \_\_\_\_\_ Required Capacity (cubic feet): \_\_\_\_\_

2.5 Are subsurface drains present within 100' of any of the application fields? YES or NO (circle one)

2.6 Are subsurface drains present in the vicinity or under the waste management system? YES or NO (circle one)

2.7 Does this facility meet all applicable siting requirements? YES or NO (circle one)

### 3. REQUIRED ITEMS CHECKLIST:

Please indicate that you have included the following required items by signing your initials in the space provided next to each item.

3.1 One completed and signed original and two copies of the application for NPDES General Permit - Animal Waste Operations;

Applicants Initials

RE

3.2 Three copies of a general location map indicating the location of the animal waste facilities and field locations where animal waste is land applied and a county road map with the location of the facility indicated;

RE

3.3 Three copies of the entire Certified Animal Waste Management Plan (CAWMP). If the facility does not have a CAWMP, it must be completed prior to submittal of a permit application for animal waste operations.

RE (part)

The CAWMP must include the following components. *Some of these components may not have been required at the time the facility was certified but should be added to the CAWMP for permitting purposes:*

- 3.3.1 The Waste Utilization Plan (WUP) must include the amount of Plant Available Nitrogen (PAN) produced and utilized by the facility
- 3.3.2 The method by which waste is applied to the disposal fields (e.g. irrigation, injection, etc.)
- 3.3.3 A map of every field used for land application
- 3.3.4 The soil series present on every land application field
- 3.3.5 The crops grown on every land application field
- 3.3.6 The Realistic Yield Expectation (RYE) for every crop shown in the WUP
- 3.3.7 The PAN applied to every land application field
- 3.3.8 The waste application windows for every crop utilized in the WUP
- 3.3.9 The required NRCS Standard specifications
- 3.3.10 A site schematic
- 3.3.11 Emergency Action Plan
- 3.3.12 Insect Control Checklist with chosen best management practices noted
- 3.3.13 Odor Control Checklist with chosen best management practices noted
- 3.3.14 Mortality Control Checklist with the selected method noted
- 3.3.15 Lagoon/storage pond capacity documentation (design, calculations, etc.); please be sure to include any site evaluations, wetland determinations, or hazard classifications that may be applicable to your facility
- 3.3.16 Operation and Maintenance Plan

If your CAWMP includes any components not shown on this list, please include the additional components with your submittal. (Composting, waste transfers, etc.)

**4. APPLICANT'S CERTIFICATION:**

I, Dixie Chops, Inc. Richard Edwards (Land Owner's name listed in question 1.2), attest that this application for Dixie Chops, Inc. PM Farm (Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete.

Signature Dixie Chops Inc by: Richard Edwards Date 3-13-2012

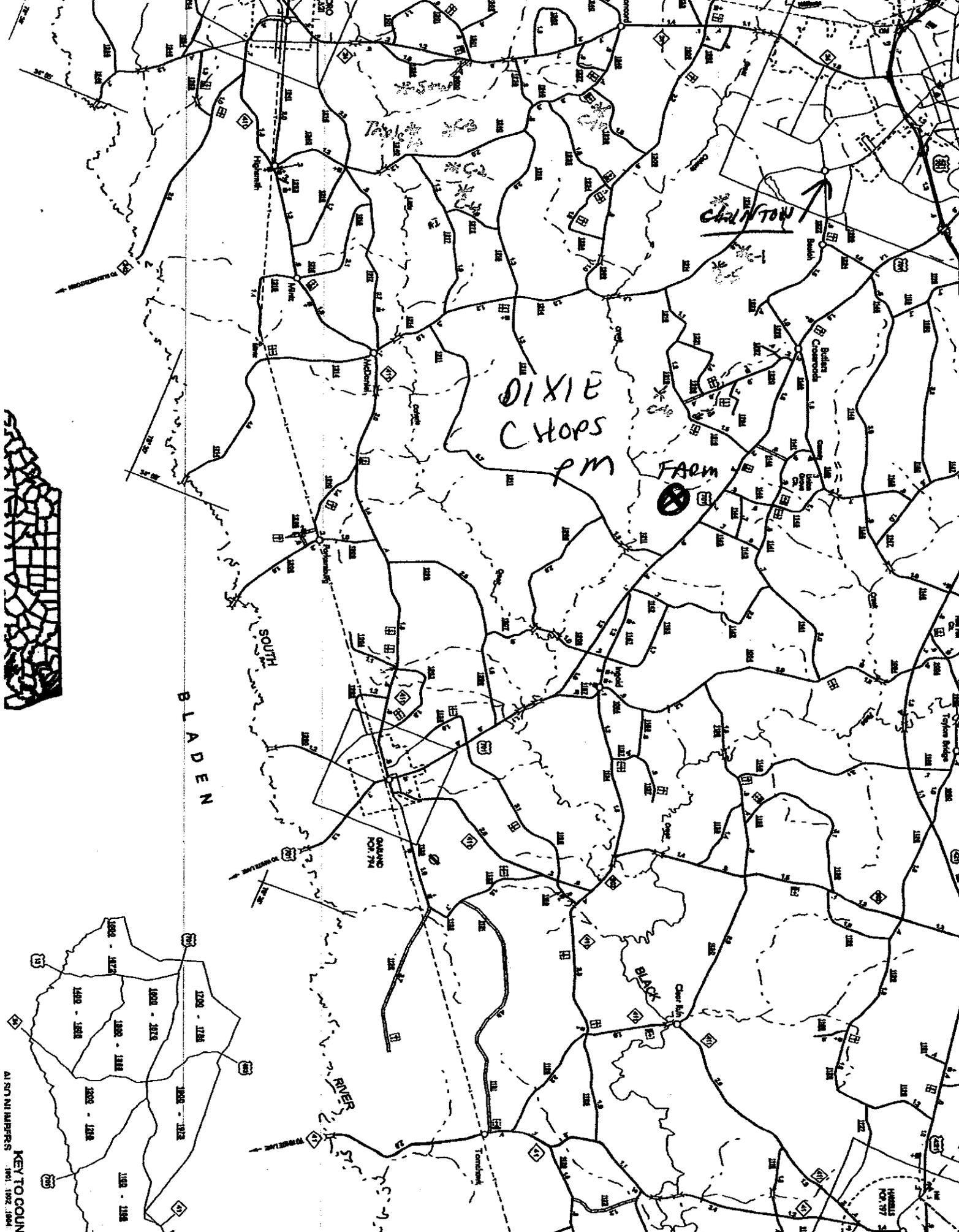
**5. MANAGER'S CERTIFICATION:** (complete only if different from the Land Owner)

I, \_\_\_\_\_ (Manager's name listed in question 1.6), attest that this application for \_\_\_\_\_ (Facility name listed in question 1.1) has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned as incomplete.

Signature \_\_\_\_\_ Date \_\_\_\_\_

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE SENT TO THE FOLLOWING ADDRESS:

**NORTH CAROLINA DIVISION OF WATER QUALITY  
AQUIFER PROTECTION SECTION  
ANIMAL FEEDING OPERATIONS UNIT  
1636 MAIL SERVICE CENTER  
RALEIGH, NORTH CAROLINA 27699-1636  
TELEPHONE NUMBER: (919) 733-3221  
FAX NUMBER: (919) 715-6048**

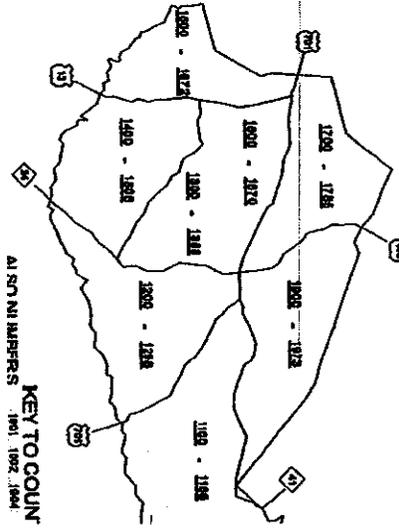
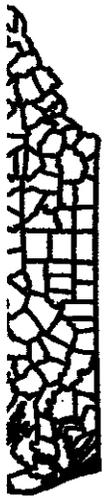


DIXIE  
CHOPS  
PM  
FARM

CLAYTON

SOUTH  
BLADEN

BLACK  
RIVER



KEY TO COUNT  
AS SHOWN IN MAPS  
1961, 1962, 1964



North Carolina Department of Environment and Natural Resources

Division of Water Quality

Coleen H. Sullins  
Director

Dee Freeman  
Secretary

Beverly Eaves Perdue  
Governor

October 1, 2009

Dixie Chops Inc  
P.M. Farm  
187 Dixie Chops Ln  
Clinton, NC 28328

Subject: Certificate of Coverage No. AWS820143  
P.M. Farm  
Swine Waste Collection, Treatment,  
Storage and Application System  
Sampson County

*Existing COC*

Dear Dixie Chops Inc:

In accordance with your renewal request, we are hereby forwarding to you this Certificate of Coverage (COC) issued to Dixie Chops Inc, authorizing the operation of the subject animal waste management system in accordance with General Permit AWG100000.

This approval shall consist of the operation of this system including, but not limited to, the management and land application of animal waste as specified in the facility's Certified Animal Waste Management Plan (CAWMP) for the P.M. Farm, located in Sampson County, with a swine animal capacity of no greater than the following annual averages:

Wean to Finish:	Feeder to Finish: <b>2950</b>	Boar/Stud:
Wean to Feeder:	Farrow to Wean:	Gilts:
Farrow to Finish:	Farrow to Feeder:	Other:

If this is a Farrow to Wean or Farrow to Feeder operation, there may be one boar for each 15 sows. Where boars are unnecessary, they may be replaced by an equivalent number of sows. Any of the sows may be replaced by gilts at a rate of 4 gilts for every 3 sows.

The COC shall be effective from the date of issuance until September 30, 2014, and shall hereby void Certificate of Coverage Number AWS820143 that was previously issued to this facility. Pursuant to this COC, you are authorized and required to operate the system in conformity with the conditions and limitations as specified in the General Permit, the facility's CAWMP, and this COC. An adequate system for collecting and maintaining the required monitoring data and operational information must be established for this facility. Any increase in waste production greater than the certified design capacity or increase in number of animals authorized by this COC (as provided above) will require a modification to the CAWMP and this COC and must be completed prior to actual increase in either wastewater flow or number of animals.

Please carefully read this COC and the enclosed State General Permit. Please pay careful attention to the record keeping and monitoring conditions in this permit. Record keeping forms are unchanged with this General Permit. Please continue to use the same record keeping forms.

If your Waste Utilization Plan (WUP) has been developed based on site-specific information, careful evaluation of future samples is necessary. Should your records show that the current WUP is inaccurate you will need to have a new WUP developed.

The issuance of this COC does not excuse the Permittee from the obligation to comply with all applicable laws, rules, standards, and ordinances (local, state, and federal), nor does issuance of a COC to operate under this permit convey any property rights in either real or personal property.

Per 15A NCAC 2T .0105(h) a compliance boundary is provided for the facility and no new water supply wells shall be constructed within the compliance boundary. Per NRCS standards a 100-foot separation shall be maintained between water supply wells and any lagoon, storage pond, or any wetted area of a spray field.

Please be advised that any violation of the terms and conditions specified in this COC, the General Permit or the CAWMP may result in the revocation of this COC, or penalties in accordance with NCGS 143-215.6A through 143-215.6C including civil penalties, criminal penalties, and injunctive relief.

If you wish to continue the activity permitted under the General Permit after the expiration date of the General Permit, then an application for renewal must be filed at least 180 days prior to expiration.

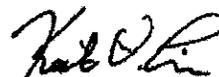
This COC is not automatically transferable. A name/ownership change application must be submitted to the Division prior to a name change or change in ownership.

If any parts, requirements, or limitations contained in this COC are unacceptable, you have the right to apply for an individual permit by contacting the Animal Feeding Operations Unit for information on this process. Unless such a request is made within 30 days, this COC shall be final and binding.

In accordance with Condition II.22 of the General Permit, waste application shall cease within four (4) hours of the time that the National Weather Service issues a Hurricane Warning, Tropical Storm Warning, or a Flood Watch associated with a tropical system for the county in which the facility is located. You may find detailed watch/warning information for your county by calling the Raleigh, NC National Weather Service office at (919) 515-8209, or by visiting their website at: [www.erh.noaa.gov/er/rah/](http://www.erh.noaa.gov/er/rah/)

This facility is located in a county covered by our Fayetteville Regional Office. The Regional Office Aquifer Protection Staff may be reached at (910) 433-3300. If you need additional information concerning this COC or the General Permit, please contact the Animal Feeding Operations Unit staff at (919) 733-3221.

Sincerely,



for Coleen H. Sullins

Enclosure (General Permit AWG100000)

cc: (Certificate of Coverage only for all ccs)  
Fayetteville Regional Office, Aquifer Protection Section  
Sampson County Health Department  
Sampson County Soil and Water Conservation District  
APS Central Files (Permit No. AWS820143)  
AFO Notebooks  
Murphy-Brown, LLC

# NUTRIENT UTILIZATION PLAN

Grower(s):	Dixie Chops Inc. - Richard Edwards
Farm Name:	PM Farm
County:	Sampson
<b>Farm Capacity:</b>	
Farrow to Wean	
Farrow to Feeder	
Farrow to Finish	
Wean to Feeder	
Feeder to Finish	
	2950
Storage Structure:	Anaerobic Lagoon
Storage Period:	>180 days
Application Method:	Irrigation

The waste from your animal facility must be land applied at a specified rate to prevent pollution of surface water and/or groundwater. The plant nutrients in the animal waste should be used to reduce the amount of commercial fertilizer required for the crops in the fields where the waste is to be applied.

This waste utilization plan uses nitrogen as the limiting nutrient. Waste should be analyzed before each application cycle. Annual soil tests are strongly encouraged so that all plant nutrients can be balanced for realistic yields of the crop to be grown.

Several factors are important in implementing your waste utilization plan in order to maximize the fertilizer value of the waste and to ensure that it is applied in an environmentally safe manner:

1. Always apply waste based on the needs of the crop to be grown and the nutrient content of the waste. Do not apply more nitrogen than the crop can utilize.
2. Soil types are important as they have different infiltration rates, leaching potentials, cation exchange capacities, and available water holding capacities.
3. Normally waste shall be applied to land eroding at less than 5 tons per acre per year. Waste may be applied to land eroding at 5 or more tons per acre annually, but less than 10 tons per acre per year providing that adequate filter strips are established.
4. Do not apply waste on saturated soils, when it is raining, or when the surface is frozen. Either of these conditions may result in runoff to surface waters which is not allowed under DWQ regulations.
5. Wind conditions should also be considered to avoid drift and downwind odor problems.
6. To maximize the value of the nutrients for crop production and to reduce the potential for pollution, the waste should be applied to a growing crop or applied not more than 30 days prior to planting a crop or forages breaking dormancy. Injecting the waste or disking will conserve nutrients and reduce odor problems.

This plan is based on the waste application method shown above. If you choose to change methods in the future, you need to revise this plan. Nutrient levels for different application methods are not the same.

The estimated acres needed to apply the animal waste is based on typical nutrient content for this type of facility. In some cases you may want to have plant analysis made, which could allow additional waste to be applied. Provisions shall be made for the area receiving waste to be flexible so as to accommodate changing waste analysis content and crop type. Lime must be applied to maintain pH in the optimum range for specific crop production.

This waste utilization plan, if carried out, meets the requirements for compliance with 15A NCAC 2H .0217 adopted by the Environmental Management Commission.

**AMOUNT OF WASTE PRODUCED PER YEAR ( gallons, ft<sup>3</sup>, tons, etc.):**

Capacity	Type	Waste Produced per Animal	Total
2950	Farrow to Wean	3212 gal/yr	gal/yr
	Farrow to Feeder	4015 gal/yr	gal/yr
	Farrow to Finish	10585 gal/yr	gal/yr
	Wean to Feeder	223 gal/yr	gal/yr
	Feeder to Finish	986 gal/yr	gal/yr
		<b>Total</b>	<b>2,908,700 gal/yr</b>

**AMOUNT OF PLANT AVAILABLE NITROGEN PRODUCED PER YEAR (lbs):**

Capacity	Type	Nitrogen Produced per Animal	Total
2950	Farrow to Wean	5.4 lbs/yr	lbs/yr
	Farrow to Feeder	6.5 lbs/yr	lbs/yr
	Farrow to Finish	26 lbs/yr	lbs/yr
	Wean to Feeder	0.48 lbs/yr	lbs/yr
	Feeder to Finish	2.3 lbs/yr	lbs/yr
		<b>Total</b>	<b>6,785 lbs/yr</b>

Applying the above amount of waste is a big job. You should plan time and have appropriate equipment to apply the waste in a timely manner.

**LAND UTILIZATION SUMMARY**

The following table describes the nutrient balance and land utilization rate for this facility. Note that the Nitrogen Balance for Crops indicates the ratio of the amount of nitrogen produced on this facility to the amount of nitrogen that the crops under irrigation may uptake and utilize in the normal growing season.

	<b>N</b>	<b>P</b>	
<b>Total Irrigated Acreage:</b>	39.41	15.73	
<b>Total N Required 1st Year:</b>	5822.495	1930.296	
<b>Total N Required 2nd Year:</b>			
<b>Average Annual Nitrogen Requirement of Crops:</b>	7,752.79	1930.296	← N equivalent of P used in page 3(b)
<b>Total Nitrogen Produced by Farm:</b>	6,785.00		
<b>Nitrogen Balance for Crops:</b>	(967.79)		

The following table describes the specifications of the hydrants and fields that contain the crops designated for utilization of the nitrogen produced on this facility. This chart describes the size, soil characteristics, and uptake rate for each crop in the specified crop rotation schedule for this facility.

Reception Area Specifications

Nitrogen

Tract	Field Hyd	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop		1st Crop		Lbs N/Ac Residual	Lbs N/Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop		Lbs N/Ac Residual	Lbs N/Ac	Total lbs N Utilized	Total lbs N Utilized		
						Yield	lbs N/Unit	Yield	lbs N/Unit													
T10128	8	1	BoB	BC	March-Sept	4.4	43.75				192.5	192.5	K	Sept-April	1	50		50	50	242.5	242.5	
	9	1.51	BoB	BC	March-Sept	4.4	43.75				192.5	290.675	K	Sept-April	1	50		50	75.5	242.5	366.175	
	10	1.75	BoB	BC	March-Sept	4.4	43.75				192.5	336.875	K	Sept-April	1	50		50	87.5	242.5	424.375	
	11	1.98	BoB	BC	March-Sept	4.4	43.75				192.5	381.15	K	Sept-April	1	50		50	99	242.5	480.15	
	12	1.68	BoB	BC	March-Sept	4.4	43.75				192.5	323.4	K	Sept-April	1	50		50	84	242.5	407.4	
	13	1.34	BoB	BC	March-Sept	4.4	43.75				192.5	257.95	K	Sept-April	1	50		50	67	242.5	324.95	
	sub03	1.65	BoB	BC	March-Sept	4.4	43.75				192.5	317.625	K	Sept-April	1	50		50	82.5	242.5	400.125	
	Leased 1	16.5	BoB	F	Mar15-April	480.0	0.104				50.96	840.84	K	Sept-April	1	75		75	1237.5	2078.34		
	Leased 2	12	WaB	O	April1-Sept15	23.0	3.98				91.54	1088.48	*					0	91.54	1098.48		
Crop Options for Leased 1&2																						
	Leased 1	16.5	BoB	D	Feb15-June	59.0	1.19				70.21	1158.465	*					0	70.21	1158.465		
	Leased 1	16.5	BoB	N	Sept-April	34.0	2.24				76.16	1256.64	*					0	76.16	1256.64		
	Leased 1	16.5	BoB	tobacco	Mar15-June	2156.0	0.036				77.616	1280.664	*					0	77.616	1280.664		
	Leased 1	16.5	BoB	K	Sept-April	1.0	75				75	1237.5	*					0	75	1237.5		
	Leased 1	16.5	BoB	O	April1-Sept15	21.0	3.96				83.16	1372.14	*					0	83.16	1372.14		
	Leased 2	12	WaB	D	Feb15-June	74.0	1.22				90.28	1083.36	*					0	90.28	1083.36		
	Leased 2	12	WaB	N	Sept-April	39.0	2.32				90.48	1085.76	*					0	90.48	1085.76		
	Leased 2	12	WaB	F	Mar15-April	637.0	0.112				71.344	856.128	*					0	71.344	856.128		
	Leased 2	12	WaB	K	Sept-April	1.0	75				75	900	*					0	75	900		
	Leased 2	12	WaB	Tobacco	Mar15-June	2548.0	0.038				96.824	1161.888	*					0	96.824	1161.888		
<b>Totals:</b>																						
																			39.41	4038.495	1783	5622.495

**Reception Area Specifications**

Tract	Field	Irrigated	Soil	1st Crop		2nd Crop		P Removals N		Lbs P		Total		Total N Utilized				
				Acres	Type	Code	Apply	Yield	Rate	asid	/Ac	Utilized	Lbs P/Ac		Utilized	Gallons		
T10128	1	1.89	BoB	C	March-Sept	4.4	12.3	54.12	102.2868	L	Sept-April	1	14.6	68.72	129.8808	92,772	231.93	
T10128	2	1.58	BoB	C	March-Sept	4.4	12.3	54.12	85.5096	L	Sept-April	1	14.6	68.72	108.5776	77,555	193.89	
T10128	3	2.12	BoB	C	March-Sept	4.4	12.3	54.12	114.7344	L	Sept-April	1	14.6	68.72	145.6864	104,062	260.15	
T10128	4	1.53	BoB	C	March-Sept	4.4	12.3	54.12	82.8036	L	Sept-April	1	14.6	68.72	105.1416	75,101	187.75	
T10128	5	1.71	BoB	C	March-Sept	4.4	12.3	54.12	92.5452	L	Sept-April	1	14.6	68.72	117.5112	83,937	209.84	
T10128	6	0.84	BoB	C	March-Sept	4.4	12.3	54.12	45.4608	L	Sept-April	1	14.6	68.72	57.7248	41,232	103.08	
T10128	7	1.23	BoB	C	March-Sept	4.4	12.3	54.12	66.5676	L	Sept-April	1	14.6	68.72	84.5256	60,375	150.94	
T10128	Sub1	3.72	BoB	C	March-Sept	4.4	12.3	54.12	201.5264	L	Sept-April	1	14.6	68.72	255.6384	182,599	456.50	
T10128	Sub2	1.11	BoB	C	March-Sept	4.4	12.3	54.12	60.0732	L	Sept-April	1	14.6	68.72	76.2792	54,485	136.21	
<p>↑ Hybrid 12-5x4-4 → Small 9 rows (Hay)</p> <p>↑ Bermuda 54.12 →</p>																		
<b>Totals:</b>				15.73					851,9076						229,668		1930,296	1930,296

*N equivalent*

This plan does not include commercial fertilizer. The farm should produce adequate plant available nitrogen to satisfy the requirements of the crops listed above.

The applicator is cautioned that P and K may be over applied while meeting the N requirements. In the future, regulations may require farmers in some parts of North Carolina to have a nutrient management plan that addresses all nutrients. This plan only addresses nitrogen.

In interplanted fields ( i.e. small grain, etc, interseeded in bermuda), forage must be removed through grazing, hay, and/or silage. Where grazing, plants should be grazed when they reach a height of six to nine inches. Cattle should be removed when plants are grazed to a height of four inches. In fields where small grain, etc, is to be removed for hay or silage, care should be exercised not to let small grain reach maturity, especially late in the season (i.e. April or May). Shading may result if small grain gets too high and this will definately interfere with stand of bermudagrass. This loss of stand will result in reduced yields and less nitrogen being utilized. Rather than cutting small grain for hay or silage just before heading as is the normal situation, you are encouraged to cut the small grain earlier. You may want to consider harvesting hay or silage two to three times during the season, depending on the time small grain is planted in the fall.

The ideal time to interplant small grain, etc, is late September or early October. Drilling is recommended over broadcasting. Bermudagrass should be grazed or cut to a height of about two inches before drilling for best results.

#### CROP CODE LEGEND

Crop Code	Crop	Lbs N utilized / unit yield
A	Barley	1.6 lbs N / bushel
B	Hybrid Bermudagrass - Grazed	50 lbs N / ton
C	Hybrid Bermudagrass - Hay	50 lbs N / ton
D	Corn - Grain	1.25 lbs N / bushel
E	Corn - Silage	12 lbs N / ton
F	Cotton	0.12 lbs N / lbs lint
G	Fescue - Grazed	50 lbs N / ton
H	Fescue - Hay	50 lbs N / ton
I	Oats	1.3 lbs N / bushel
J	Rye	2.4 lbs N / bushel
K	Small Grain - Grazed	50 lbs N / acre
L	Small Grain - Hay	50 lbs N / acre
M	Grain Sorghum	2.5 lbs N / cwt
N	Wheat	2.4 lbs N / bushel
O	Soybean	4.0 lbs N / bushel
P	Pine Trees	40 lbs N / acre / yr

Acres shown in the preceding table are considered to be the usable acres excluding required buffers, filter strips along ditches, odd areas unable to be irrigated, and perimeter areas not receiving full application rates due to equipment limitations. Actual total acres in the fields listed may, and most likely will be, more than the acres shown in the tables.

See attached map showing the fields to be used for the utilization of animal waste.

## SLUDGE APPLICATION:

The following table describes the annual nitrogen accumulation rate per animal in the lagoon sludge

Farm Specifications	PAN/yr/animal	Farm Total/yr
Farrow to Wean	0.84	
Farrow to Feeder	1	
Farrow to Finish	4.1	
Wean to Feeder	0.072	
2950 Feeder to Finish	0.36	1062

The waste utilization plan must contain provisions for periodic land application of sludge at agronomic rates. The sludge will be nutrient rich and will require precautionary measures to prevent over application of nutrients or other elements. Your production facility will produce approximately 1062 pounds of plant available nitrogen per year will accumulate in the lagoon sludge based on the rates of accumulation listed above.

If you remove the sludge every 5 years, you will have approximately 5310 pounds of plant available nitrogen to utilize. Assuming you apply this PAN to hybrid bermuda grass hayland at the rate of 300 pounds of nitrogen per acre, you will need 17 acres of land. If you apply the sludge to corn at a rate of 125 pounds per acre, you will need 42.48 acres of land. Please note that these are only estimates of the PAN produced and the land required to utilize that PAN. Actual values may only be determined by sampling the sludge for plant available nitrogen content prior to application. Actual utilization rates will vary with soil type, crop, and realistic yield expectations for the specific application fields designated for sludge application at time of removal.

## APPLICATION OF WASTE BY IRRIGATION:

The irrigation application rate should not exceed the intake rate of the soil at the time of irrigation such that runoff or ponding occurs. This rate is limited by initial soil moisture content, soil structure, soil texture, water droplet size, and organic solids. The application amount should not exceed the available water holding capacity of the soil at the time of irrigation nor should the plant available nitrogen applied exceed the nitrogen needs of the crop.

If surface irrigation is the method of land application for this plan, it is the responsibility of the producer and irrigation designer to ensure that an irrigation system is installed to properly irrigate the acres shown in the preceding table. Failure to apply the recommended rates and amounts of nitrogen shown in the tables may make this plan invalid.

\*This is the maximum application amount allowed for the soil assuming the amount of nitrogen allowed for the crop is not over applied. In many situations, the application amount shown cannot be applied because of the nitrogen limitation. The maximum application amount shown can be applied under optimum soil conditions.

Your facility is designed for >180 days of temporary storage and the temporary storage must be removed on the average of once every 6 months. In no instance should the volume of the waste stored in your structure be within the 25 year 24 hour storm storage or one foot of freeboard except in the event of the 25 year 24 hour storm.

It is the responsibility of the producer and waste applicator to ensure that the spreader equipment is operated properly to apply the correct rates to the acres shown in the tables. Failure to apply the recommended rates and amounts of nitrogen shown in the tables may make this plan invalid.

Call your technical specialist after you receive the waste analysis report for assistance in determining the amount of waste per acre and the proper application prior to applying the waste.

## Application Rate Guide

The following is provided as a guide for establishing application rates and amounts.

Tract	Hydrant	Soil Type	Crop	Application Rate in/hr	Application Amount * inches
T10128	8	BoB	BC	0.75	1
	9	BoB	BC	0.75	1
	10	BoB	BC	0.75	1
	11	BoB	BC	0.75	1
	12	BoB	BC	0.75	1
	13	BoB	BC	0.75	1
	sub3	BoB	BC	0.75	1
	Leased 1	BoB	F	0.75	1
	Leased 2	WaB	O	0.6	1
	ions for Le:				
Leased 1	BoB	D	0.75	1	
Leased 1	BoB	tobacco	0.75	1	
Leased 1	BoB	K	0.75	1	
Leased 2	WaB	D	0.6	1	
Leased 2	WaB	N	0.6	1	
Leased 2	WaB	F	0.6	1	
Leased 2	WaB	D	0.6	1	
Leased 2	WaB	N	0.6	1	
Leased 2	WaB	F	0.6	1	
Leased 2	WaB	K	0.6	1	
Leased 2	WaB	Tobacco	0.6	1	

### Additional Comments:

This nutrient utilization plan written for the Dixie Chops, Inc's PM Farm, facility 82-143 has the components required for nitrogen and phosphorus applications. The PLAT certification form and required documentation has been submitted, all other documentation is on-site for review as required. I have attached documentation to support the P removal rates used on page 3(b). All of the formula's used on page 3(b) to determine lbs. P utilized, lbs. P/Ac, Total lbs. P utilized are the same as they are on page 3(a) for nitrogen.

To convert Total lbs P Utilized to Total N Utilized, the following steps were taken:

1. Converted Total lbs. P Utilized to total Gallons by dividing the total P utilized by the phosphorus concentration unit of 1.4 lbs. P/1000 gallons
2. Convert Total Gallons to Total N Utilized by multiplying total gallons by the nitrogen concentration unit of 2.5 lbs. N /1000 gallons.

Producer has two leased fields in this NUP and agreements are on-site for review. Leased fields may be planted in any of the crops listed on page 3(a) in any combination **except** both fields cannot be in cotton at the same time without both fields being in a harvested winter crop.

The leased fields will also work well in a 2 year crop rotation. This producer is aware of the fields that have a "high" PLAT rating and understands that a rating change to "Very High" would mean that he could no longer apply swine effluent to those fields.

The bermuda shown of page 3(a) of this plan is in a graze/hay combination rate, producer will remove 1/2 of the yield produced with haying practices.

The producer has up to 16.5 acres available to him in field "Leased 1" and 12 acres in "Leased 2", however is only required to maintain enough crops on the Leased field acres to utilize 2,210 Total Lbs.N a year (in addition to all bermuda fields) for application with an aeway or honeywagon.

# NUTRIENT UTILIZATION PLAN CERTIFICATION

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**Name of Farm:** PM Farm  
**Owner:** Dixie Chops Inc. - Richard Edwards  
**Manager:**

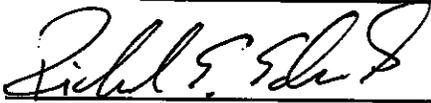
**Owner/Manager Agreement:**

I/we understand and will follow and implement the specifications and the operation and maintenance procedures established in the approved animal waste nutrient management plan for the farm named above. I/we know that any expansion to the existing design capacity of the waste treatment and/or storage system, or construction of new facilities, will require a new nutrient management plan and a new certification to be submitted to DWQ before the new animals are stocked.

I/we understand that I must own or have access to equipment, primarily irrigation equipment, to land apply the animal waste described in this nutrient management plan. This equipment must be available at the appropriate pumping time such that no discharge occurs from the lagoon in the event of a 25 year 24 hour storm. I also certify that the waste will be applied on the land according to this plan at the appropriate times and at rates which produce no runoff.

This plan will be filed on site at the farm office and at the office of the local Soil and Water Conservation District and will be available for review by NCDWQ upon request.

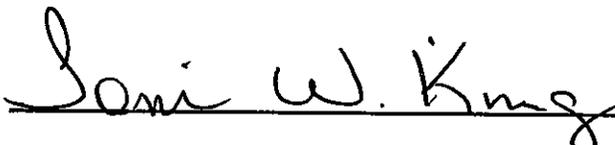
**Name of Facility Owner:** Dixie Chops Inc. - Richard Edwards

**Signature:**  8-24-2012  
Date

**Name of Manager (if different from owner):** \_\_\_\_\_

**Signature:** \_\_\_\_\_  
Date

**Name of Technical Specialist:** Toni W. King  
**Affiliation:** Murphy-Brown, LLC.  
**Address:** 2822 Hwy 24 West, PO Drawer 856  
Warsaw, NC 28398  
**Telephone:** (910) 293-3434

**Signature:**  8-24-2012  
Date

# NUTRIENT UTILIZATION PLAN

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## REQUIRED SPECIFICATIONS

- 1 Animal waste shall not reach surface waters of the state by runoff, drift, manmade conveyances, direct application, or direct discharge during operation or land application. Any discharge of waste which reaches surface water is prohibited.
- 2 There must be documentation in the design folder that the producer either owns or has an agreement for use of adequate land on which to properly apply the waste. If the producer does not own adequate land to properly dispose of the waste, he/she shall provide evidence of an agreement with a landowner, who is within a reasonable proximity, allowing him/her the use of the land for waste application. It is the responsibility of the owner of the waste production facility to secure an update of the Nutrient Utilization Plan when there is a change in the operation, increase in the number of animals, method of application, receiving crop type, or available land.
- 3 Animal waste shall be applied to meet, but not exceed, the nitrogen needs for realistic crop yields based upon soil type, available moisture, historical data, climatic conditions, and level of management, unless there are regulations that restrict the rate of applications for other nutrients.
- 4 Animal waste shall be applied to land eroding less than 5 tons per acre per year. Waste may be applied to land eroding at more than 5 tons per acre per year but less than 10 tons per acre per year provided grass filter strips are installed where runoff leaves the field (See USDA, NRCS Field Office Technical Guide Standard 393 - Filter Strips).
- 5 Odors can be reduced by injecting the waste or disking after waste application. Waste should not be applied when there is danger of drift from the land application field.
- 6 When animal waste is to be applied on acres subject to flooding, waste will be soil incorporated on conventionally tilled cropland. When waste is applied to conservation tilled crops or grassland, the waste may be broadcast provided the application does not occur during a season prone to flooding (See "Weather and Climate in North Carolina" for guidance).
- 7 Liquid waste shall be applied at rates not to exceed the soil infiltration rate such that runoff does not occur offsite or to surface waters and in a method which does not cause drift from the site during application. No ponding should occur in order to control odor and flies.
- 8 Animal waste shall not be applied to saturated soils, during rainfall events, or when the surface is frozen.

# NUTRIENT UTILIZATION PLAN

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## REQUIRED SPECIFICATIONS

(continued)

9 Animal waste shall be applied on actively growing crops in such a manner that the crop is not covered with waste to a depth that would inhibit growth. The potential for salt damage from animal waste should also be considered.

10 Nutrients from waste shall not be applied in fall or winter for spring planted crops on soils with a high potential for leaching. Waste/nutrient loading rates on these soils should be held to a minimum and a suitable winter cover crop planted to take up released nutrients. Waste shall not be applied more than 30 days prior to planting of the crop or forages breaking dormancy.

11 Any new swine facility sited on or after October 1, 1995 shall comply with the following: The outer perimeter of the land area onto which waste is applied from a lagoon that is a component of a swine farm shall be at least 50 feet from any residential property boundary and canal. Animal waste, other than swine waste from facilities sited on or after October 1, 1995, shall not be applied closer than 25 feet to perennial waters.

12 Animal waste shall not be applied closer than 100 feet to wells.

13 Animal waste shall not be applied closer than 200 feet of dwellings other than those owned by the landowner.

14 Waste shall be applied in a manner not to reach other property and public right-of-ways.

15 Animal waste shall not be discharged into surface waters, drainageways, or wetlands by discharge or by over-spraying. Animal waste may be applied to prior converted cropland provided the fields have been approved as a land application site by a "technical specialist". Animal waste shall not be applied on grassed waterways that discharge directly into water courses, and on other grassed waterways, waste shall be applied at agronomic rates in a manner that causes no runoff or drift from the site.

16 Domestic and industrial waste from washdown facilities, showers, toilets, sinks, etc., shall not be discharged into the animal waste management system.

# NUTRIENT UTILIZATION PLAN

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## REQUIRED SPECIFICATIONS

(continued)

- 17 A protective cover of appropriate vegetation will be established on all disturbed areas (lagoon embankments, berms, pipe runs, etc.). Areas shall be fenced, as necessary, to protect the vegetation. Vegetation such as trees, shrubs, and other woody species, etc., are limited to areas where considered appropriate. Lagoon areas should be kept mowed and accessible. Berms and structures should be inspected regularly for evidence of erosion, leakage, or discharge.
- 18 If animal production at the facility is to be suspended or terminated, the owner is responsible for obtaining and implementing a "closure plan" which will eliminate the possibility of an illegal discharge, pollution and erosion.
- 19 Waste handling structures, piping, pumps, reels, etc., should be inspected on a regular basis to prevent breakdowns, leaks and spills. A regular maintenance checklist should be kept on site.
- 20 Animal waste can be used in a rotation that includes vegetables and other crops for direct human consumption. However, if animal waste is used on crops for direct human consumption, it should only be applied pre-plant with no further applications of animal waste during the crop season.
- 21 Highly visible markers shall be installed to mark the top and bottom elevations of the temporary storage (pumping volume) of all waste treatment lagoons. Pumping shall be managed to maintain the liquid level between the markers. A marker will be required to mark the maximum storage volume for waste storage ponds.
- 22 Waste shall be tested within 60 days of utilization and soil shall be tested at least annually at crop sites where waste products are applied. Nitrogen shall be the rate-determining nutrient, unless other restrictions require waste to be applied based on other nutrients, resulting in a lower application rate than a nitrogen based rate. Zinc and copper levels in the soil shall be monitored and alternative crop sites shall be used when these metals approach excessive levels. pH shall be adjusted and maintained for optimum crop production. Soil and waste analysis records shall be kept for a minimum of five years. Poultry dry waste application records shall be maintained for a minimum of three years. Waste application records for all other waste shall be maintained for a minimum of five
- 23 years.
- Dead animals will be disposed of in a manner that meets North Carolina regulations.





**IRRIGATION SYSTEM DESIGNER**

Name: Micah Kevin Weston, CID  
Company: Murphy-Brown, LLC  
Address: 2822 Hwy 24 West, P.O. Box 856 Warsaw, NC 28398  
Phone: (910) 293-3434



**Required Documentation**

The following details of design and materials must accompany all irrigation designs:

1. A scale drawing of the proposed irrigation system which includes hydrant locations, pipelines, thrust block locations and buffer areas where applicable.
2. Assumptions and computations for determining total dynamic head and horsepower requirements.
3. Computations used to determine all mainline and lateral pipe sizes.
4. Sources and/or calculations used for determining application rates.
5. Computations used to determine the size of thrust blocks and illustrations of all thrust block configurations required in the system
6. Manufacturer's specifications for the irrigation pump, traveler and sprinkler(s).
7. Manufacturer's specifications for the irrigation pipe and/or USDA-NRCS standard for IRRIGATION WATER CONVEYANCE.
8. The information required by this form are the minimum requirements. It is the responsibility of the designer to consider all relevant factors at a particular site and address them as appropriate.
9. Irrigation pipes should not be installed in lagoon or storage pond embankments without the approval of the designer.

**NOTE:** A buffer strip of 25' or wider must be maintained between the limits of the irrigation system and all perennial streams and surface waters per NC Statutes.

**Narrative of Irrigation System Operation**

This design is for a "wetter acreage" determination for an existing facility. The acres were calculated based on the equipment specified and the charts created by NCSU for calculating Area Allowances for Hard Hose Traveler Systems.

Refer to owner's manual and irrigation dealer for information on maintenance, winterization, and operation of system.

**CALCULATIONS****Sprinkler Specifications**

Sprinkler Type: Nelson 100  
 Nozzle Size: 0.80TR inches  
 Sprinkler Pressure: 30 psi  
 Flowrate(GPM): 96 gpm  
 Wetted Diameter: 185 feet \* Reflects field measurement

**Lane Spacings**

Desired Spacing (%): 70 %  
 Design Spacing(feet): 129.5 \*PVC irrigation pipe normally comes in 20' pieces,  
 so round to the nearest multiple of 20.  
 Actual Spacing (feet): 120 feet  
 Actual Spacing (%): 65 %

**Application Rate**

Application Rate =  $(96.3 \times \text{Flowrate}) / (3.1415 \times (.9 \times \text{radius})^2)$

Design App. Rate = 0.42 in/hr  
 300 degree arc = 0.51 in/hr      330 degree arc = 0.46 in/hr  
 220 degree arc = 0.69 in/hr  
 180 degree arc = 0.85 in/hr

**Traveller Speed**

Travel speed =  $1.605 \times \text{Flowrate} / \text{Desired application amount} \times \text{Lane Spacing}$

Desired app. (in.) = 0.5 inches      360 degree arc = 2.57 ft/min  
 300 degree arc = 3.08 ft/min      330 degree arc = 2.80 ft/min  
 220 degree arc = 4.11 ft/min  
 180 degree arc = 5.14 ft/min

**Mainline Velocity**

Velocity =  $.408 \times \text{Flowrate} / \text{pipe diameter squared}$  feet/sec.\*\*

\*\*For buried pipelines, velocity should be below 5 feet per second

Pipe size: 4 inches  
 Velocity= 2.45 ft/sec.

				Dixie Chops, Inc. PM Farm; 82-143					
				Acreage Calculations - 3/23/2012					
Pull #	Width (ft.)	Length (ft.)	Acres (midsection)	Total Acres (midsection)	Start End (ac.)	Stop End (ac.)	Total Pull Acres		
1	152.5	398	1.393	1.393	0.275	0.220	1.89		
2	152.5	372	1.302	1.302	0.275	0.000	1.58		
3	152.5	528	1.848	1.848	0.275	0.000	2.12		
4	152.5	238	0.833	1.259	0.275	0.000	1.53		
	60	309	0.426	0.000	0.000	0.000	0.00		
5	152.5	348	1.218	1.218	0.275	0.220	1.71		
6	120	154	0.424	0.424	0.235	0.180	0.84		
7	113.5	186	0.485	0.733	0.275	0.220	1.23		
	152.5	71	0.249	0.000	0.000	0.000	0.00		
8	108	56	0.139	0.510	0.275	0.220	1.00		
	152.5	106	0.371	0.000	0.000	0.000	0.00		
9	78	245	0.439	1.097	0.235	0.180	1.51		
	120	239	0.658	0.000	0.000	0.000	0.00		
10	120	484	1.333	1.333	0.235	0.180	1.75		
11	120	569	1.567	1.567	0.235	0.180	1.98		
12	120	459	1.264	1.264	0.235	0.180	1.68		
13	60	74	0.102	1.023	0.206	0.110	1.34		
	137	293	0.922	0.000	0.000	0.000	0.00		
	0	0	0.000	0.000	0.000	0.000	0.00		
	0	0	0.000	0.000	0.000	0.000	0.00		
	0	0	0.000	0.000	0.000	0.000	0.00		
								<b>Total Acres</b>	<b>20.16</b>

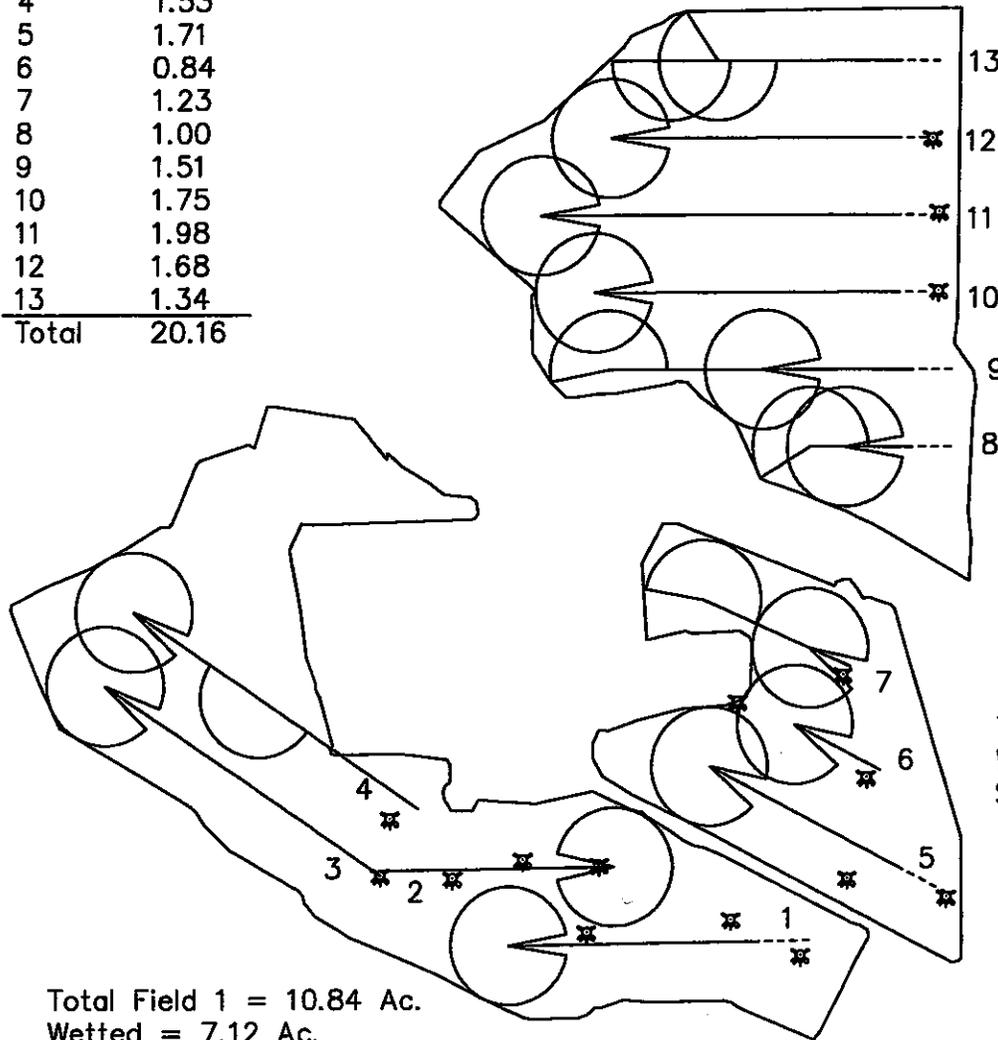
# Dixie Chops, Inc. PM Farm

Fac. No. 82-143

Scale: 1"=300'

Pull#	Acres
1	1.89
2	1.58
3	2.12
4	1.53
5	1.71
6	0.84
7	1.23
8	1.00
9	1.51
10	1.75
11	1.98
12	1.68
13	1.34
<b>Total</b>	<b>20.16</b>

Total Field 3 = 10.91 Ac.  
 Wetted = 9.26 Ac.  
 Sub = 1.65 Ac.



Total Field 1 = 10.84 Ac.  
 Wetted = 7.12 Ac.  
 Sub = 3.72 Ac.

Total Field 2 = 4.89 Ac.  
 Wetted = 3.78 Ac.  
 Sub = 1.11 Ac.

Specifications:

- Ag Rain w/Nelson 100
- w/0.80TR nozzle @30 PSI
- 185' WD & 96 GPM (measured)
- 120' Lane Spacings



Supplement to Waste Utilization Plan

**General Recommendations for Phosphorus Application**

September 18, 2006

**Introduction:** On occasion, it is necessary to supplement an existing Waste Utilization Plan with recommendations for Phosphorus application in order to meet current NRCS 590 Standard for cost share from the local Soil & Water Conservation office. As it has been for quite some time with Nitrogen based plans, phosphorus is applied at rates greater than needed for crop production until the point of soil test P saturation reaches the level (as measured by PLAT) of HIGH or VERY-HIGH. Over application of P is OK from an environmental standpoint as long as P-Loss is monitored at least every 5 years and PLAT ratings remain LOW or MEDIUM.

Be aware that crops remove phosphorus from the soil at a slow rate in association with yield and crop. The following rates of P removal are per unit of yield (tons, bushels, etc).

<b>Crop</b>	<b>P Removal Rate</b>	<b>Yield Unit</b>
Hybrid Bermuda- Hay	12.3	Ton
Hybrid Bermuda- Pasture	1.2	Ton
Small Grain Overseeding (50# or 1 ton)	14.6	Ton
Small Grain Overseeding (100# or 2 tons)	13.6	Ton
Fescue- Hay	15.7	Ton
Fescue- Pasture	1.6	Ton
Corn- Grain	0.44	Bushel
Wheat- Grain	0.5	Bushel
Soybeans- Full Season	0.8	Bushel
Soybeans- Double Cropped	0.8	Bushel
Cotton	0.03	Pound

To use the above table simply multiply the rate times the RYE expected from the planned crop. The resultant figure is a good value to plug into a Waste Utilization Plan to make the producer aware of why P levels are likely to increase over time.

Crops that are removed via grazing only remove about 10% of the P listed above as opposed to haying or harvesting. (Reduction already made on pasture labeled crops.)

If other crops are needed, contact Samuel G. Warren, DC, NRCS or refer to the database supplied with NC Partnership's Nutrient Management Software program.

Sewage Lagoon Liquid

DRAFT

Animal Name	Application Method	Animal Substans	NCDACS Code	Animals Live Weight (lbs)		Days Per Group	Lagoon Liquid Accumulation			Total Nutrient Analysis (lb/acre-ft volume)			Plant Availability Coefficient			NCDACS Lab Measure Testing			Total Anaerobic Lagoon Liquid Capacity (ft <sup>3</sup> )		Total Lagoon Liquid Surplus		PAN		PAN						
				Initial	Final		Measure and urine	excess water usage	surface rain surplus	total	% total N or P	lb/acre-ft	lb/acre-ft	N	P	K <sub>2</sub> O	2-stage, first	2-stage, second	single stage	2-stage, first	2-stage, second	ac-HY	ac-HY	N	P	K <sub>2</sub> O	N	P	K <sub>2</sub> O		
Swine Anaerobic Lagoon Liquid	Irrigated	Wean-Feeder	ALS-R	10	50	30	6	48	30	20	.11	.61	135	62	53	133	0.50	0.70	0.70	60	45	15	191	0.007	58	37	93	0.48	0.28	0.88	
Swine Anaerobic Lagoon Liquid	Irrigated	Feeder-Fin		50	220	135	3	105	1.4	.9	.5	2.7	136	82	53	103	0.50	0.50	0.70	270	200	70	927	0.034	68	37	95	2.3	1.3	3.2	
Swine Anaerobic Lagoon Liquid	Irrigated	Gilt Dev		50	250	150	2	140	1.5	1.0	.5	3.0	133	62	53	133	0.50	0.50	0.70	300	225	75	1015	0.037	58	37	93	2.5	1.4	3.5	
Swine Anaerobic Lagoon Liquid	Irrigated	Bear Stud		250	550	400	1	385	4.0	2.7	1.4	8.1	68	82	28	67	0.50	0.50	0.70	500	375	125	2859	0.11	34	19	47	3.7	2	5.1	
Swine Anaerobic Lagoon Liquid	Irrigated	Farrow-Wean					2	433	1.1	4.3	2.8	1.6	8.8	91	82	35	89	0.50	0.50	0.70	650	435	215	3203	0.12	45	25	62	5.4	2.9	7.3
Swine Anaerobic Lagoon Liquid	Irrigated	Farrow-Feeder					2	522	5	3	2	11	91	82	35	89	0.50	0.50	0.70	783	523	260	3981	0.14	46	25	62	6.5	3.5	8.8	
Swine Anaerobic Lagoon Liquid	Irrigated	Farrow-Fin					2	1417	14	8	5	28	138	82	53	133	0.50	0.50	0.70	2633	2125	708	10478	0.39	58	37	93	25	14	38	
Swine Anaerobic Lagoon Liquid	Soil Injected	Wean-Feeder	ALS-IN	10	50	30	6	48	30	20	.11	.61	5.0	82	1.9	4.9	0.50	0.77	0.80	60	45	15	191	0.007	4.4	1.6	3.9	0.83	0.5	0.76	
Swine Anaerobic Lagoon Liquid	Soil Injected	Feeder-Fin		50	220	135	3	105	1.4	.9	.5	2.7	5.0	82	1.9	4.9	0.50	0.77	0.80	270	200	70	927	0.034	4.4	1.6	3.9	1.4	3.6		
Swine Anaerobic Lagoon Liquid	Soil Injected	Gilt Dev		50	250	150	2	140	1.5	1.0	.5	3.0	5.0	82	1.9	4.9	0.50	0.77	0.80	300	225	75	1015	0.037	4.4	1.6	3.9	1.4	3.6		
Swine Anaerobic Lagoon Liquid	Soil Injected	Bear Stud		250	550	400	1	385	4.0	2.7	1.4	8.1	2.5	82	1.0	2.5	0.50	0.77	0.80	500	375	125	2859	0.11	2.2	0.76	2	6.4	2.3	5.8	
Swine Anaerobic Lagoon Liquid	Soil Injected	Farrow-Wean					2	433	1.1	4.3	2.8	1.6	8.8	3.3	82	1.3	3.3	0.50	0.77	0.80	650	435	215	3203	0.12	2.9	1	2.6	9.3	3.3	8.4
Swine Anaerobic Lagoon Liquid	Soil Injected	Farrow-Feeder					2	522	5	3	2	11	3.3	82	1.3	3.3	0.50	0.77	0.80	783	523	260	3981	0.14	2.9	1	2.6	11	4	10	
Swine Anaerobic Lagoon Liquid	Soil Injected	Farrow-Fin					2	1417	14	8	5	28	5.0	82	1.9	4.9	0.50	0.77	0.80	2633	2125	708	10478	0.39	4.4	1.6	3.9	46	16	41	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Wean-Feeder	ALS-SI	10	50	30	6	48	30	20	.11	.61	5.0	82	1.9	4.9	0.50	0.79	0.75	60	45	15	191	0.007	3.9	1.6	3.7	0.75	0.28	0.7	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Feeder-Fin		50	220	135	3	105	1.4	.9	.5	2.7	5.0	82	1.9	4.9	0.50	0.79	0.75	270	200	70	927	0.034	3.9	1.6	3.7	3.7	1.4	3.4	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Gilt Dev		50	250	150	2	140	1.5	1.0	.5	3.0	5.0	82	1.9	4.9	0.50	0.79	0.75	300	225	75	1015	0.037	3.9	1.6	3.7	4	1.5	3.7	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Bear Stud		250	550	400	1	385	4.0	2.7	1.4	8.1	2.5	82	1.0	2.5	0.50	0.79	0.75	500	375	125	2859	0.11	2	0.73	1.8	5.8	2.2	5.4	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Farrow-Wean					2	433	1.1	4.3	2.8	1.6	8.8	3.3	82	1.3	3.3	0.50	0.79	0.75	650	435	215	3203	0.12	2.8	0.97	2.6	8.4	3.1	7.9
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Farrow-Feeder					2	522	5	3	2	11	3.3	82	1.3	3.3	0.50	0.79	0.75	783	523	260	3981	0.14	2.8	0.97	2.5	10	3.8	9.5	
Swine Anaerobic Lagoon Liquid	Soil Incorporated	Farrow-Fin					2	1417	14	8	5	28	5.0	82	1.9	4.9	0.50	0.79	0.75	2633	2125	708	10478	0.39	3.9	1.5	3.7	4.1	15	39	
Swine Anaerobic Lagoon Liquid	Broadcast	Wean-Feeder	ALS-BR	10	50	30	6	48	30	20	.11	.61	5.0	82	1.9	4.9	0.50	0.46	0.70	60	45	15	191	0.007	2.3	1.4	3.4	0.44	0.28	0.68	