Murphy-Brown LLC

PO Drawer 856
2822 Hwy. 24 West
Warsaw, NC 28398
Tel: 910-293-3434
Fax: 910-293-3138

July 11, 2011

North Carolina Division of Water Quality
Aquifer Protection Section
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636
Attn.: Keith Larick

Subject: Application for NPDES Permit for
8531
Facility Number: 46-9
Hertford County

Please accept the enclosed application package for NPDES permit coverage for the above-mentioned facility. Murphy-Brown, LLC wishes to emphasize that we are submitting this application package voluntarily and not because this farm discharges or proposes to discharge. Although this farm is designed, constructed, operated and maintained not to discharge, we recognize that unforeseen events and acts of God can occur. Therefore, as suggested in the preamble to EPA's November 20, 2008 revised CAFO rule, we wish to seek the protections afforded NPDES permit coverage should unforeseen events or acts of God cause this farm to discharge notwithstanding the fact that it is designed, constructed, operated and maintained not to discharge.

Also, this is a request that the above-mentioned facility be considered for conversion from a 1000 head Farrow-Finish facility to a 3272 head Farrow-Wean facility.

If you have any questions regarding this matter, please do not hesitate to call me at (910) 293-5363, or e-mail me at kevinweston@murphybrownllc.com.

Sincerely,

Kevin Weston
Environmental Compliance

RECEIVED / DENR / DWQ
Aquifer Protection Section
JUL 12 2011

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

1. GENERAL INFORMATION:

1.1 Facility name: 8531

1.2 Print Land Owner's name: Murphy-Brown, LLC

1.3 Mailing address: P.O. Box 856

City, State: Warsaw, NC Zip: 28398

Telephone number (include area code): (910) 293 - 3434

1.4 Physical address: 227 Jim Hardy Rd.

City, State: Woodland, NC Zip: 27897

Telephone number (include area code): (_____) _____ - _____

1.5 County where facility is located: Hertford

1.6 Facility location (directions from nearest major highway, using SR numbers for state roads): off SR1152; 0.7 miles from NC Hwy 561

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, LLC

1.9 Facility's original start-up date: 1992 Date(s) of facility expansion(s) (if applicable): _____

2. OPERATION INFORMATION:

2.1 Facility number: 46-9

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.

Type of Swine	No. of Animals	Type of Poultry	No. of Animals	Type of Cattle	No. of Animals
☐ Wean to Feeder	_____	☐ Layer	_____	☐ Beef Brood Cow	_____
☐ Feeder to Finish	_____	☐ Non-Layer	_____	☐ Beef Feeder	_____
☒ Farrow to Wean (# sow)	3272	☐ Turkey	_____	☐ Beef Stocker Calf	_____
☐ Farrow to Feeder (# sow)	_____	☐ Turkey Poults	_____	☐ Dairy Calf	_____
☐ Farrow to Finish (# sow)	_____			☐ Dairy Heifer	_____
☐ Wean to Finish (# sow)	_____			☐ Dry Cow	_____
☐ Gilts	_____			☐ Milk Cow	_____
☐ Boar/Stud	_____				

☐ Other Type of Livestock on the farm: _____ No. of Animals: _____

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Aquifer Protection Section
JUL 12 2011

2.3 Acreage cleared and available for application (excluding all required buffers and areas not covered by the application system): 283.45 Required Acreage (as listed in the CAWMP): 81.12

2.4 Number of lagoons: 2 Total Capacity (cubic feet): 3,165,509 Required Capacity (cubic feet): 2,277,518

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.

Applicants Initials

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

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; MKW

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. MKW

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, Murphy-Brown, LLC (Land Owner's name listed in question 1.2), attest that this application for 8531 (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 by: _____ Date 7-11-11

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

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Aquifer Protection Section
JUL 12 2011

6. SURFACE WATER CLASSIFICATION:

This form must be completed by the appropriate DWQ regional office and included as a part of the project submittal information.

INSTRUCTIONS TO NC PROFESSIONALS:

The classification of the downslope surface waters (the surface waters that any overflow from the facility would flow toward) in which this animal waste management system will be operated must be determined by the appropriate DWQ regional office. Therefore, you are required, **prior to submittal of the application package,** to submit this form, with items 1 through 6 completed, to the appropriate Division of Water Quality Regional Aquifer Protection Supervisor (see page 6 of 10). At a minimum, you must include an 8.5" by 11" copy of the portion of a 7.5 minute USGS Topographic Map which shows the location of this animal waste application system and the downslope surface waters in which they will be located. Identify the closest downslope surface waters on the attached map copy. **Once the regional office has completed the classification, reincorporate this completed page and the topographic map into the complete application form and submit the application package.**

6.1 Farm Name: Farm 31

6.2 Name & complete address of engineering firm: Murphy-Brown, LLC P.O. Box 856 Warsaw, NC 28398

Telephone number: (910) 293 - 3434

6.3 Name of closest downslope surface waters: Cutawhiskie Creek

6.4 County(ies) where the animal waste management system and surface waters are located Hertford

6.5 Map name and date: Woodland, NC Quadrangle, 1977

6.6 NC Professional's Seal (If appropriate), Signature, and Date: Kevin Westbrook 5/11/2010

TO: REGIONAL AQUIFER PROTECTION SUPERVISOR

Please provide me with the classification of the watershed where this animal waste management facility will be or has been constructed or field located, as identified on the attached map segment(s):

Name of surface waters: Cutawhiskie Swamp

Classification (as established by the Environmental Management Commission): C; NSW

Proposed classification, if applicable: _____

Signature of regional office personnel: Marlene Salyer Date: May 17, 2010

(All attachments must be signed)

MAY 14 2010

Murphy-Brown LLC

PO Drawer 856
2822 Hwy. 24 West
Warsaw, NC 28398
Tel: 910-293-3434
Fax: 910-293-3138

May 11, 2010

Washington Regional APS Supervisor
943 Washington Square Mall
Washington, NC 27889

Subject: Surface Water Classification for
Farm 31; Facility No. 46-9
Hertford County

Enclosed please find a copy of the Surface Water Classification form from the NPDES Permit Application along with an 8.5"x11" copy of an USGS Quadrangle map showing the location of the facility mentioned above. Please provide me with the classification of the watershed where this facility is located.

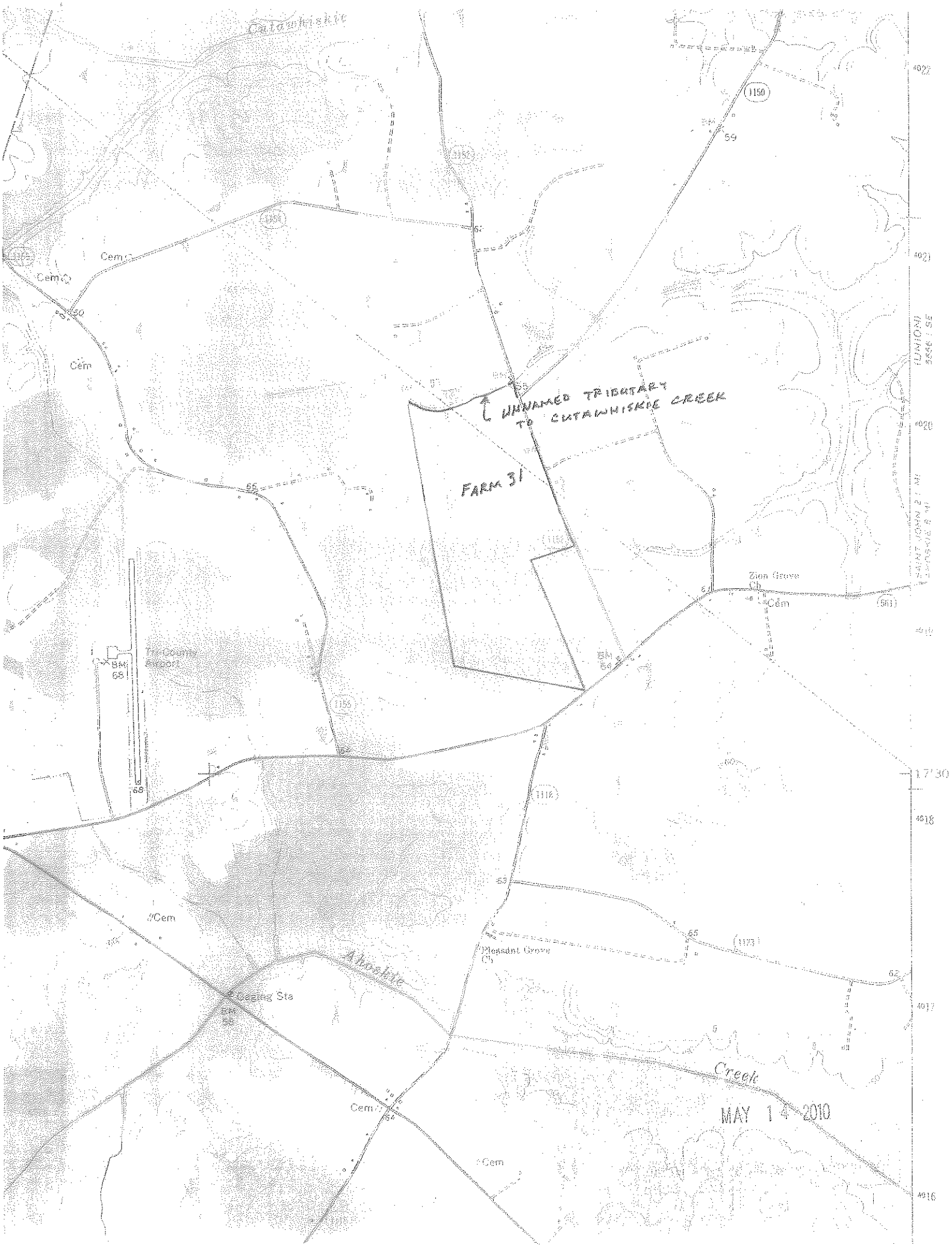
If you have any questions regarding this matter, please do not hesitate to call me at (910) 293-3434 ext. 5363.

Sincerely,

Kevin Weston, CID
Environmental Compliance

Cc.: Murphy-Brown, LLC Files

MAY 14 2010



Cutawhiskie
UNNAMED TRIBUTARY TO CUTAWHISKIE CREEK
FARM 31
Cem
Zion Grove Ch
Tri-County Airport
Pleasant Grove Ch
Ahoskie
Creek
Cem
MAY 14 2010
17'30

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Aquifer Protection Section

Animal Waste Management Plan Certification

(Please type or print all information that does not require a signature)

Existing or New or Expanded (please circle one)

General Information:

Permit No: AWG100000

Name of Farm: 8531

Facility No: 46--9

Owner(s) Name: Murphy-Brown, LLC

Phone No: (910) 293-3434

Mailing Address: P.O. Box 856 Warsaw, NC 28398

Farm Location:

County Farm is located in: Hertford

Latitude and Longitude: 36 18' 21" / 77 08' 55"

Integrator: Murphy-Brown, LLC

Please attach a copy of a county road map with location identified and describe below (Be specific: road names, directions, milepost, etc.): From Rich Square, take NC Hwy 561 north approx. 8.50 miles and turn left onto SR 1152 (Jim Hardy Rd.) and go approx. 0.70 miles to farm entrance on the left.

Operation Description:

Type of Swine	*No. of Animals*	*Type of Poultry*	*No. of Animals*	*Type of Dairy*	*No. of Animals*
Wean to Feeder		Layer		Milking	
Feeder to Finish		Non-Layer		Dry	
Farrow to Wean	3272	*Type of Beef*	*No. of Animals*	Heifers	
Farrow to Feeder		Brood		Calves	
Farrow to Finish		Feeders			
Gilts		Stockers			
Boars		*Other Type of Livestock:*		*Number of Animals:*	

Expanding Operation Only

Previous Design Capacity: *Additional Design Capacity:* *Total Design Capacity:*

Acreage Available for Application: 283.45 Required Acreage: 81.12

Number of waste structures: 2 Total Capacity: 3,165,509 Cubic Feet (ft^3)

Are subsurface drains present on the farm: **YES** or **NO** (please circle one)

If YES: are subsurface drains present in the area of the waste structures (please circle one or both as applicable)

****

Owner / Manager Agreement

I (we) verify that all the above information is correct and will be updated upon changing. I (we) understand the operation and maintenance procedures established in the approved animal waste management plan for the farm named above and will implement these procedures. I (we) know that any expansion to the existing design capacity of the waste treatment and storage system or construction of new facilities will require a permit application and a new certification to be submitted to the Division of Water Quality (DWQ) and permit approval received before the new animals are stocked. I (we) understand that there must be no discharge of animal waste from the storage system to surface waters of the state unless specifically allowed under a permit from DWQ and there must not be run-off from the application of animal waste. I (we) understand that run-off of pollutants from lounging and heavy use areas must be minimized using technical standards developed by the USDA-Natural Resources Conservation Service (NRCS). The approved plan will be filed at the farm and at the DWQ Regional Office and the office of the local Soil and Water Conservation District (SWCD). I (we) know that any modification must be approved by a technical specialist and submitted to the DWQ Regional Office and local SWCD and required approvals received from DWQ prior to implementation. A change in farm ownership requires a permit application to be sent to DWQ along with a new certification (if the approved plan is changed).

Name of Land Owner: Murphy-Brown, LLC

Signature: _____ **Date:** _____

Name of Manager (if different from owner): _____

Signature: _____ **Date:** 7-11-11

Technical Specialist Certification

I. As a technical specialist designated by the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 6H .0104, I certify that the animal waste management system for the farm named above has an animal waste management plan that meets or exceeds standards and specifications of the Division of Water Quality as specified in 15A NCAC 2T .1300 (formerly 2H .0217) and the USDA-Natural Resources Conservation Service and/or the North Carolina Soil and Water Conservation Commission pursuant to 15A NCAC 2T .1300 (formerly 2H .0217) and 15A NCAC 6F .0101-.0105. The following elements are included in the plan as applicable. While each category designates a technical specialist who may sign each certification (SD, SI, WUP, RC, I), the technical specialist should only certify parts for which they are technically competent.

II. Certification of Design

A) Collection, Storage, Treatment System
Check the appropriate box

✱ **Existing facility without retrofit (SD or WUP)**
Storage volume is adequate for operation capacity; storage capability consistent with waste utilization requirements.

New, expanded or retrofitted facility (SD)
Animal waste storage and treatment structures, such as but not limited to collection systems, lagoons and ponds, have been designed to meet or exceed the minimum standards and specifications.

Name of Technical Specialist (Please Print): M. Kevin Weston
Affiliation Murphy-Brown, LLC Date Work Completed: _____
Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434
Signature: M. Kevin Weston Date: 7/7/2011

B) Land Application Site (WUP)
The plan provides for minimum separations (buffers); adequate amount of land for waste utilization; chosen crop is suitable for waste management; and the hydraulic and nutrient loading rates are appropriate for the site and receiving crop.

Name of Technical Specialist (Please Print): M. Kevin Weston
Affiliation Murphy-Brown, LLC Date Work Completed: _____
Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434
Signature: M. Kevin Weston Date: 7/7/2011

C) Runoff Controls from Exterior Lots
Check the appropriate box

X **Facility without exterior lots (SD or WUP or RC)**
This facility does not contain any exterior lots.

Facility with exterior lots (RC)
Methods to minimize the run off of pollutants from lounging and heavy use areas have been designed in accordance with technical standards developed by NRCS.

Name of Technical Specialist (Please Print): M. Kevin Weston
Affiliation Murphy-Brown, LLC Date Work Completed: _____
Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434
Signature: M. Kevin Weston Date: 7/7/2011

D). Application and Handling Equipment

Check the appropriate box

X Existing or expanding facility with existing waste application equipment (WUP or I)
Animal waste application equipment specified in the plan has been either field calibrated or evaluated in accordance with existing design charts and tables and is able to apply waste as necessary to accommodate the waste management plan: (existing application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates, a schedule for timing of applications has been established; required buffers can be maintained and calibration and adjustment guidance are contained as part of the plan).

New, expanded, or existing facility without existing waste application equipment for spray irrigation. (I)
Animal waste application equipment specified in the plan has been designed to apply waste as necessary to accommodate the waste management plan; (proposed application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates; a schedule for timing of applications has been established; required buffers can be maintained; calibration and adjustment guidance are contained as part of the plan).

New, expanded, or existing facility without existing waste application equipment for land spreading not using spray irrigation. (WUP or I)
Animal waste application equipment specified in the plan has been selected to apply waste as necessary to accommodate the waste management plan; (proposed application equipment can cover the area required by the plan at rates not to exceed either the specified hydraulic or nutrient loading rates; a schedule for timing of applications has been established; required buffers can be maintained; calibration and adjustment guidance are contained as part of the plan).

Name of Technical Specialist (Please Print): M. Kevin Weston

Affiliation Murphy-Brown, LLC Date Work Completed: _____

Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434

Signature: M. Kevin Weston Date: 7/7/2011

E) Odor Control, Insect Control, Mortality Management and Emergency Action Plan (SD, SI, WUP, RC or I)

The waste management plan for this facility includes a Waste Management Odor Control Checklist, an Insect Control Checklist, a Mortality Management Checklist and an Emergency Action Plan. Sources of both odors and insects have been evaluated with respect to this site and Best Management Practices to Minimize Odors and Best Management Practices to Control Insects have been selected and included in the waste management plan. Both the Mortality Management Plan and the Emergency Action Plan are complete and can be implemented by this facility.

Name of Technical Specialist (Please Print): M. Kevin Weston

Affiliation Murphy-Brown, LLC Date Work Completed: _____

Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434

Signature: M. Kevin Weston Date: 7/7/2011

F) Written Notice of New or Expanding Swine Farm

The following signature block is only to be used for new or expanding swine farms that begin construction after June 21, 1996. If the facility was built before June 21, 1996, when was it constructed or last expanded ____.

I (we) certify that I (we) have attempted to contact by certified mail all adjoining property owners and all property owners who own property located across a public road, street, or highway from this new or expanding swine farm. The notice was in compliance with the requirements of NCGS 106-805. A copy of the notice and a list of the property owners notified are attached.

Name of Land Owner: _____

Signature: _____ **Date:** _____

Name of Manager (if different from owner): _____

Signature: _____ **Date:** _____

III. Certification of Installation

A) Collection, Storage, Treatment Installation

New, expanded or retrofitted facility (SI)

Animal waste storage and treatment structures, such as but not limited to lagoons and ponds, have been installed in accordance with the approved plan to meet or exceed the minimum standards and specifications.

For existing facilities without retrofits, no certification is necessary.

Name of Technical Specialist (Please Print):_____

Affiliation_____ Date Work Completed:_____

Address (Agency):_____ Phone No.:_____

Signature:_____ Date:_____

B) Land Application Site (WUP)

The cropping system is in place on all land as specified in the animal waste management plan.

Name of Technical Specialist (Please Print): M. Kevin Weston

Affiliation Murphy-Brown, LLC Date Work Completed:_____

Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No.(910) 293-3434

Signature: M. Kevin Weston Date: 7/7/2011

C) Runoff Controls from Exterior Lots (RC)

Facility with exterior lots

Methods to minimize the run off of pollutants from lounging and heavy use areas have been installed as specified in the plan.

For facilities without exterior lots, no certification is necessary.

Name of Technical Specialist (Please Print):_____

Affiliation_____ Date Work Completed:_____

Address (Agency):_____ Phone No.:_____

Signature:_____ Date:_____

D) Application and Handling Equipment Installation (WUP or I)

X Animal waste application and handling equipment specified in the plan is on site and ready for use; calibration and adjustment materials have been provided to the owners and are contained as part of the plan.

Animal waste application and handling equipment specified in the plan has not been installed but the owner has proposed leasing or third party application and has provided a signed contract; equipment specified in the contract agrees with the requirements of the plan; required buffers can be maintained; calibration and adjustment guidance have been provided to the owners and are contained as part of the plan.

Name of Technical Specialist (Please Print): M. Kevin Weston

Affiliation Murphy-Brown, LLC Date Work Completed:_____

Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No.(910) 293-3434

Signature: M. Kevin Weston Date: 7/7/2011

E) Odor Control, Insect Control and Mortality Management (SD, SI, WUP, RC or I)

Methods to control odors and insects as specified in the Plan have been installed and are operational. The mortality management system as specified in the Plan has also been installed and is operational.

Name of Technical Specialist (Please Print): M. Kevin Weston

Affiliation Murphy-Brown, LLC Date Work Completed: _____

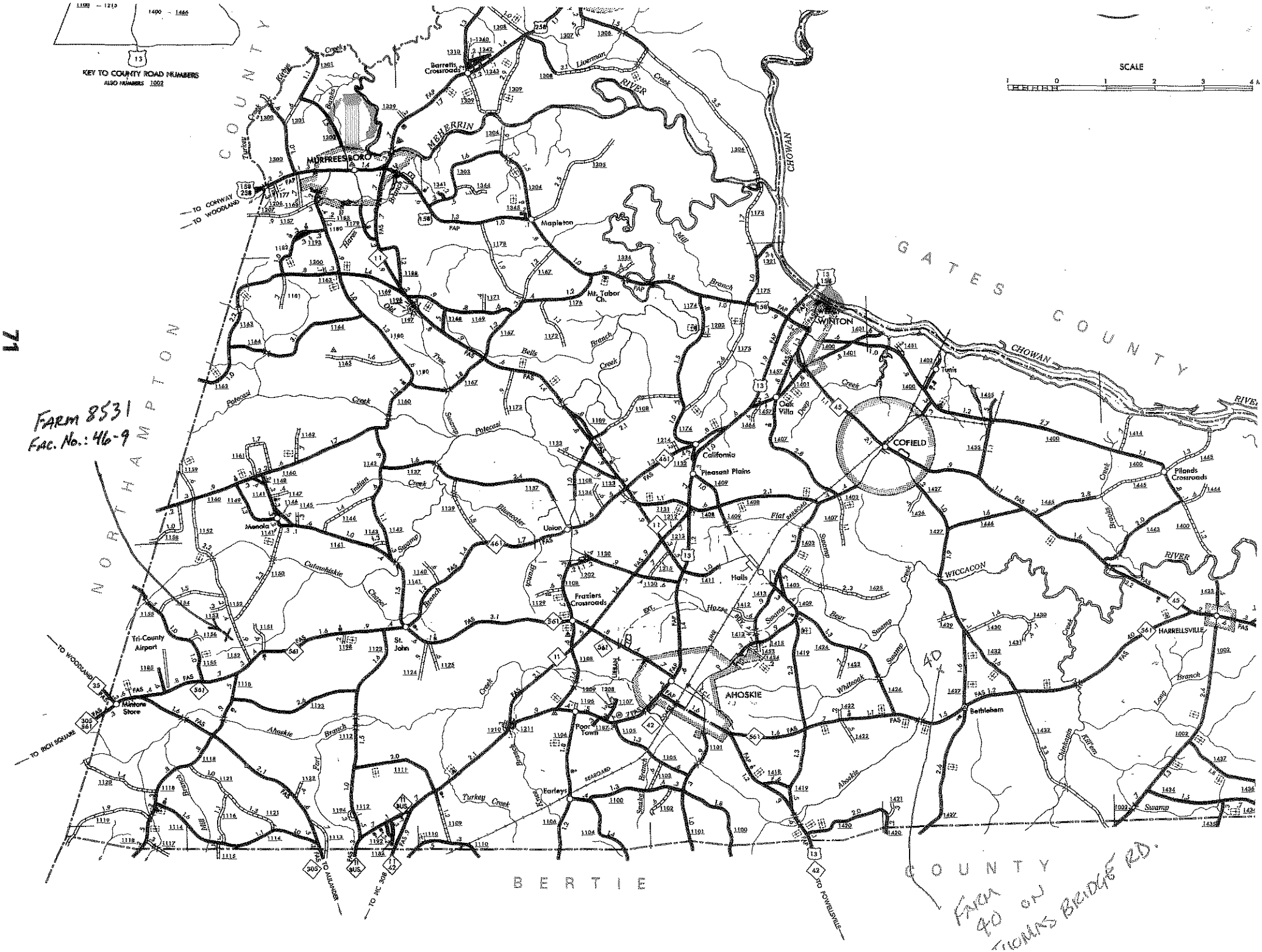
Address (Agency): P.O. Box 856 Warsaw, NC 28398 Phone No. (910) 293-3434

Signature: M. Kevin Weston Date: 7/7/2011

Please return the completed form to the Division of Water Quality at the following address:

Department of Environment and Natural Resources
Division of Water Quality
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636

Please also remember to submit a copy of this form along with the complete Animal Waste Management Plan to the DWQ Regional Office and the local Soil and Water Conservation District Office and to keep a copy in your files with your Animal Waste Management Plan.


KEY TO COUNTY ROAD NUMBERS
ALSO NUMBERS 1002
SCALE
NORTHAMPTON COUNTY
GATES COUNTY
BERTIE COUNTY
MURFREESBORO
WINTON
COFIELD
AHOSKIE
HARRELLSVILLE
Barretts Crossroads
Mapleton
Mt. Tabor Ch.
Oak Villa
California
Pleasant Plains
Union
Menola
Fraziers Crossroads
St. John
Tri-County Airport
Mebane Store
Poor Town
Earleys
Halls
Bethlehem
Pilands Crossroads
Tunis
MEHERRIN RIVER
CHOWAN RIVER
WICCACON
TO CONWAY
TO WOODLAND
TO RICH SQUARE
TO AULANDER
TO WC 308
TO POWELLSVILLE
FARM 8531
FAC. No.: 46-9
FARM 40 ON THOMAS BRIDGE RD.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Coleen H. Sullins
Director

Dee Freeman
Secretary

October 1, 2009

Existing COC

Murphy-Brown, LLC
Farm 31
PO Box 856
Warsaw, NC 283980856

Subject: Certificate of Coverage No. AWS460009
Farm 31
Swine Waste Collection, Treatment,
Storage and Application System
Hertford County

Dear Murphy-Brown, LLC:

In accordance with your renewal request, we are hereby forwarding to you this Certificate of Coverage (COC) issued to Murphy-Brown, LLC, 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 Farm 31, located in Hertford County, with a swine animal capacity of no greater than the following annual averages:

Wean to Finish:	Feeder to Finish:	Boar/Stud:
Wean to Feeder:	Farrow to Wean:	Gilts:
Farrow to Finish: **1000**	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 AWS460009 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.

1636 Mail Service Center, Raleigh, North Carolina 27699-1636
Location: 2728 Capital Blvd., Raleigh, North Carolina 27604
Phone: 919-733-3221 \ FAX: 919-715-0588 \ Customer Service: 1-877-623-6748
Internet: www.ncwaterquality.org
An Equal Opportunity \ Affirmative Action Employer

One NorthCarolina Naturally

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 Wakefield, VA National Weather Service office at (757) 899-4200, or by visiting their website at: www.erh.noaa.gov/er/akq/

This facility is located in a county covered by our Washington Regional Office. The Regional Office Aquifer Protection Staff may be reached at (252) 946-6481. 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)
Washington Regional Office, Aquifer Protection Section
Hertford County Health Department
Hertford County Soil and Water Conservation District
APS Central Files (Permit No. AWS460009)
AFO Notebooks
Murphy-Brown, LLC

Murphy-Brown LLC

PO Drawer 856
2822 Hwy. 24 West
Warsaw, NC 28398
Tel: 910-293-3434
Fax: 910-293-3138

August 9, 2011

North Carolina Division of Water Quality
Aquifer Protection Section
Animal Feeding Operations Unit
1636 Mail Service Center
Raleigh, NC 27699-1636
Attn.: J.R. Joshi

Subject: Additional Information for NPDES Permit for
8531
Facility Number: 46-9
Hertford County

Please find enclosed a revised copy of the Nutrient Utilization Plan for the above-mentioned facility. The PLAT information for this facility was recently sent to you by Toni King. This revised NUP shows that the leased fields are optional. These fields have been optional for some time, and since only a few of them have actually been applied to from this facility in the past, there is limited current soils analysis information , especially for the fields that have never been applied to. Murphy-Brown, LLC would like to keep these fields as optional application fields, realizing that no applications can or will be made to these fields until a phosphorus assessment (PLAT) has been completed and the results submitted to your office. Any applications will be made in accordance with the findings of the assessment.

If you have any questions regarding this matter, please do not hesitate to call me at (910) 293-5363, or e-mail me at kevinweston@murphybrownllc.com.

Sincerely,

Kevin Weston
Environmental Compliance

Murphy-Brown, LLC

8/8/2011

2822 Hwy 24 West
P.O. Box 856
Warsaw, NC 28398

NUTRIENT UTILIZATION PLAN

Grower(s):	Murphy-Brown, LLC
Farm Name:	Farm 8531; Fac. No.: 46-9
County:	Hertford
Farm Capacity:	
Farrow to Wean	3272
Farrow to Feeder	
Farrow to Finish	
Wean to Feeder	
Feeder to Finish	
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^3, tons, etc.):

Capacity	Type	Waste Produced per Animal	Total
3272	Farrow to Wean	3212 gal/yr	10,509,664 gal/yr
	Farrow to Feeder	4015 gal/yr	gal/yr
	Farrow to Finish	10,585 gal/yr	gal/yr
	Wean to Feeder	223 gal/yr	gal/yr
	Feeder to Finish	986 gal/yr	gal/yr
		Total	**10,509,664 gal/yr**

AMOUNT OF PLANT AVAILABLE NITROGEN PRODUCED PER YEAR (lbs): ****Based on 25% reduction from 2 stage lagoon system**

Capacity	Type	Nitrogen Produced per Animal	Total
3272	Farrow to Wean	5.4 lbs/yr	17,669 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
		Total	**13,252 lbs/yr** **

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.

Total Irrigated Acreage:	**81.12**
Total N Required 1st Year:	**19727.47**
Total N Required 2nd Year:	**13502.68**

Average Annual Nitrogen Requirement of Crops:	**16,615.07**
Total Nitrogen Produced by Farm:	**13,251.60**
Nitrogen Balance for Crops:	**(3,363.47)**

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 Year 1 of a 2 year rotation

Tract	Field	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop Yield	1st Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop Yield	2nd Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	Total Lbs N/Ac	Total lbs N Utilized
3735	D	18.88	Craven	D	Feb15-June	115.0	1.25	15	128.75	2430.8	N	Sept-Apr	60	2.4		144	2718.72	272.75	5149.52
3735	1	3.32	Craven	D	Feb15-June	115.0	1.25	15	128.75	427.45	N	Sept-Apr	60	2.4		144	478.08	272.75	905.53
3735	2	4.41	Craven	D	Feb15-June	115.0	1.25	15	128.75	567.7875	N	Sept-Apr	60	2.4		144	635.04	272.75	1202.828
3735	3	3.54	Craven	D	Feb15-June	115.0	1.25	15	128.75	455.775	N	Sept-Apr	60	2.4		144	509.76	272.75	965.535
3735	4	3.6	Craven	D	Feb15-June	115.0	1.25	15	128.75	463.5	N	Sept-Apr	60	2.4		144	518.4	272.75	981.9
3735	5	4.78	Craven	D	Feb15-June	115.0	1.25	15	128.75	615.425	N	Sept-Apr	60	2.4		144	688.32	272.75	1303.745
3735	6	5.11	Lenoir	D	Feb15-June	110.0	1.25	15	122.5	625.975	N	Sept-Apr	50	2.4		120	613.2	242.5	1239.175
3735	7	4.56	Craven	H	Aug-Jul	3.5	50		175	798	*					0	0	175	798
3735	8	2.71	Craven	H	Aug-Jul	3.5	50		175	474.25	*					0	0	175	474.25
3735	9	1.56	Craven	H	Aug-Jul	3.5	50		175	273	*					0	0	175	273
3735	10	3.05	Lenoir	H	Aug-Jul	4.0	50		200	610	*					0	0	200	610
3735	11	4.25	Craven	H	Aug-Jul	3.5	50		175	743.75	*					0	0	175	743.75
3735	12	3.2	Lenoir	H	Aug-Jul	4.0	50		200	640	*					0	0	200	640
3735	Sub1	6.99	Craven	D	Feb15-June	115.0	1.25	15	128.75	899.9625	N	Sept-Apr	60	2.4		144	1006.56	272.75	1906.523
3735	Sub2	1.9	Lenoir	H	Aug-Jul	4.0	50		200	380	*					0	0	200	380
3735	Sub3	2.77	Craven	H	Aug-Jul	3.5	50		175	484.75	*					0	0	175	484.75
3735	Sub4	4.64	Craven	D	Feb15-June	115.0	1.25	15	128.75	597.4	N	Sept-Apr	60	2.4		144	668.16	272.75	1265.56
3735	Sub5	1.18	Lenoir	D	Feb15-June	110.0	1.25	15	122.5	144.55	N	Sept-Apr	50	2.4		120	141.6	242.5	286.15
3735	Sub6	0.67	Craven	H	Aug-Jul	3.5	50		175	117.25	*					0	0	175	117.25
Totals:		*81.12*								*11749.63*							*7977.84*		*19727.47*

D = Corn grain

H = Fescue Hay

O = Soybeans

Reception Area Specifications

Year 2 of a 2 year rotation

Tract	Field	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop Yield	1st Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop Yield	2nd Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	Total Lbs N/Ac	Total lbs N Utilized
3735	D	18.88	Craven	O	Apr-Sept15	40.0	4		160	3020.8	*					0	0	160	3020.8
3735	1	3.32	Craven	O	Apr-Sept15	40.0	4		160	531.2	*					0	0	160	531.2
3735	2	4.41	Craven	O	Apr-Sept15	40.0	4		160	705.6	*					0	0	160	705.6
3735	3	3.54	Craven	O	Apr-Sept15	40.0	4		160	566.4	*					0	0	160	566.4
3735	4	3.6	Craven	O	Apr-Sept15	40.0	4		160	576	*					0	0	160	576
3735	5	4.78	Craven	O	Apr-Sept15	40.0	4		160	764.8	*					0	0	160	764.8
3735	6	5.11	Lenoir	O	Apr-Sept15	38.0	4		152	776.72	*					0	0	152	776.72
3735	7	4.56	Craven	H	Aug-Jul	3.5	50		175	798	*					0	0	175	798
3735	8	2.71	Craven	H	Aug-Jul	3.5	50		175	474.25	*					0	0	175	474.25
3735	9	1.56	Craven	H	Aug-Jul	3.5	50		175	273	*					0	0	175	273
3735	10	3.05	Lenoir	H	Aug-Jul	4.0	50		200	610	*					0	0	200	610
3735	11	4.25	Craven	H	Aug-Jul	3.5	50		175	743.75	*					0	0	175	743.75
3735	12	3.2	Lenoir	H	Aug-Jul	4.0	50		200	640	*					0	0	200	640
3735	Sub1	6.99	Craven	O	Apr-Sept15	40.0	4		160	1118.4	*					0	0	160	1118.4
3735	Sub2	1.9	Lenoir	H	Aug-Jul	4.0	50		200	380	*					0	0	200	380
3735	Sub3	2.77	Craven	H	Aug-Jul	3.5	50		175	484.75	*					0	0	175	484.75
3735	Sub4	4.64	Craven	O	Apr-Sept15	40.0	4		160	742.4	*					0	0	160	742.4
3735	Sub5	1.18	Lenoir	O	Apr-Sept15	38.0	4		152	179.36	*					0	0	152	179.36
3735	Sub6	0.67	Craven	H	Aug-Jul	3.5	50		175	117.25	*					0	0	175	117.25
Totals:		*81.12*								*13502.68*							*0*		*13502.68*

Reception Area Specifications

Brinkley Lease

Tract	Field	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop Yield	1st Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop Yield	2nd Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	Total Lbs N/Ac	Total lbs N Utilized
1368	1	10.67	Craven	D	Feb15-June	115.0	1.25		143.75	1533.813	CoverCrop	Sept-Apr	1	30		30	320.1	173.75	1853.913
1368	2	6.59	Craven	D	Feb15-June	115.0	1.25		143.75	947.3125	CoverCrop	Sept-Apr	1	30		30	197.7	173.75	1145.013
1368	3	9.6	Norfolk	D	Feb15-June	115.0	1.25		143.75	1380	CoverCrop	Sept-Apr	1	30		30	288	173.75	1668
1368	4	25.6	Craven	D	Feb15-June	115.0	1.25		143.75	3680	CoverCrop	Sept-Apr	1	30		30	768	173.75	4448
1368	1	10.67	Craven	O	Apr-Sept15	40.0	4		160	1707.2	N	Sept-Apr	60	2.4		144	1536.48	304	3243.68
1368	2	6.59	Craven	O	Apr-Sept15	40.0	4		160	1054.4	N	Sept-Apr	60	2.4		144	948.96	304	2003.36
1368	3	9.6	Norfolk	O	Apr-Sept15	42.0	4		168	1612.8	N	Sept-Apr	60	2.4		144	1382.4	312	2995.2
1368	4	25.6	Craven	O	Apr-Sept15	40.0	4		160	4096	N	Sept-Apr	60	2.4		144	3686.4	304	7782.4
1368	1	10.67	Craven	Peanuts	Pre-Plant	1.0	50		50	533.5	*					0	0	50	533.5
1368	2	6.59	Craven	Peanuts	Pre-Plant	1.0	50		50	329.5	*					0	0	50	329.5
1368	3	9.6	Norfolk	Peanuts	Pre-Plant	1.0	50		50	480	*					0	0	50	480
1368	4	25.6	Craven	Peanuts	Pre-Plant	1.0	50		50	1280	*					0	0	50	1280
		Leased land is optional for plan. Subtract 15 lbs. Residual from any crop																	
				following beans or peanuts.															
Totals:		*52.46*								*7541.125*							*1573.8*		*9114.925*

Reception Area Specifications

Jenkins Lease

Tract	Field	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop Yield	1st Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop Yield	2nd Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	Total Lbs N/Ac	Total lbs N Utilized
1374	1	52.28	Craven	D	Feb15-June	115.0	1.25		143.75	7516.25	Cover Crop	Sept-April	1	30		30	1568.4	173.75	9083.65
1374	3	12.32	Craven	D	Feb15-June	115.0	1.25		143.75	1771	Cover Crop	Sept-April	1	30		30	369.6	173.75	2140.6
1374	5	4.08	Caroline	D	Feb15-June	100.0	1.25		125	510	Cover Crop	Sept-April	1	30		30	122.4	155	632.4
1374	6	4.49	Craven	D	Feb15-June	115.0	1.25		143.75	645.4375	Cover Crop	Sept-April	1	30		30	134.7	173.75	780.1375
1374	7	4.46	Craven	D	Feb15-June	115.0	1.25		143.75	641.125	Cover Crop	Sept-April	1	30		30	133.8	173.75	774.925
1374	9	4.41	Craven	D	Feb15-June	115.0	1.25		143.75	633.9375	Cover Crop	Sept-April	1	30		30	132.3	173.75	766.2375
1374	10	2.23	Craven	D	Feb15-June	115.0	1.25		143.75	320.5625	Cover Crop	Sept-April	1	30		30	66.9	173.75	387.4625
1374	12	5.56	Lenoir	D	Feb15-June	110.0	1.25		137.5	764.5	Cover Crop	Sept-April	1	30		30	166.8	167.5	931.3
1374	13	7.38	Lenoir	D	Feb15-June	110.0	1.25		137.5	1014.75	Cover Crop	Sept-April	1	30		30	221.4	167.5	1236.15
1374	15	1.01	Craven	D	Feb15-June	115.0	1.25		143.75	145.1875	Cover Crop	Sept-April	1	30		30	30.3	173.75	175.4875
1374	16	1.19	Caroline	D	Feb15-June	100.0	1.25		125	148.75	Cover Crop	Sept-April	1	30		30	35.7	155	184.45
1374	17	11.61	Craven	D	Feb15-June	115.0	1.25		143.75	1668.938	Cover Crop	Sept-April	1	30		30	348.3	173.75	2017.238
1374	18	6.49	Craven	D	Feb15-June	115.0	1.25		143.75	932.9375	Cover Crop	Sept-April	1	30		30	194.7	173.75	1127.638
1374	19	17.97	Craven	D	Feb15-June	115.0	1.25		143.75	2583.188	Cover Crop	Sept-April	1	30		30	539.1	173.75	3122.288
1374	20	8.43	Lenoir	D	Feb15-June	110.0	1.25		137.5	1159.125	Cover Crop	Sept-April	1	30		30	252.9	167.5	1412.025
1374	21	2.3	Craven	D	Feb15-June	115.0	1.25		143.75	330.625	Cover Crop	Sept-April	1	30		30	69	173.75	399.625
1374	22	3.66	Craven	D	Feb15-June	115.0	1.25		143.75	526.125	Cover Crop	Sept-April	1	30		30	109.8	173.75	635.925
1374	1	52.28	Craven	O	Apr-Sept15	40.0	4		160	8364.8	N	Sept-April	60	2.4		144	7528.32	304	15893.12
1374	3	12.32	Craven	O	Apr-Sept15	40.0	4		160	1971.2	N	Sept-April	60	2.4		144	1774.08	304	3745.28
1374	5	4.08	Caroline	O	Apr-Sept15	38.0	4		152	620.16	N	Sept-April	50	2.4		120	489.6	272	1109.76
1374	6	4.49	Craven	O	Apr-Sept15	40.0	4		160	718.4	N	Sept-April	50	2.4		120	538.8	280	1257.2
1374	7	4.46	Craven	O	Apr-Sept15	40.0	4		160	713.6	N	Sept-April	60	2.4		144	642.24	304	1355.84
1374	9	4.41	Craven	O	Apr-Sept15	40.0	4		160	705.6	N	Sept-April	60	2.4		144	635.04	304	1340.64
1374	10	2.23	Craven	O	Apr-Sept15	40.0	4		160	356.8	N	Sept-April	60	2.4		144	321.12	304	677.92
1374	12	5.56	Lenoir	O	Apr-Sept15	38.0	4		152	845.12	N	Sept-April	50	2.4		120	667.2	272	1512.32
1374	13	7.38	Lenoir	O	Apr-Sept15	38.0	4		152	1121.76	N	Sept-April	50	2.4		120	885.6	272	2007.36
1374	15	1.01	Craven	O	Apr-Sept15	40.0	4		160	161.6	N	Sept-April	60	2.4		144	145.44	304	307.04
1374	16	1.19	Caroline	O	Apr-Sept15	38.0	4		152	180.88	N	Sept-April	50	2.4		120	142.8	272	323.68
1374	17	11.61	Craven	O	Apr-Sept15	40.0	4		160	1857.6	N	Sept-April	60	2.4		144	1671.84	304	3529.44
1374	18	6.49	Craven	O	Apr-Sept15	40.0	4		160	1038.4	N	Sept-April	60	2.4		144	934.56	304	1972.96
1374	19	17.97	Craven	O	Apr-Sept15	40.0	4		160	2875.2	N	Sept-April	60	2.4		144	2587.68	304	5462.88
1374	20	8.43	Lenoir	O	Apr-Sept15	38.0	4		152	1281.36	N	Sept-April	50	2.4		120	1011.6	272	2292.96
1374	21	2.3	Craven	O	Apr-Sept15	40.0	4		160	368	N	Sept-April	60	2.4		144	331.2	304	699.2
1374	22	3.66	Craven	O	Apr-Sept15	40.0	4		160	585.6	N	Sept-April	60	2.4		144	527.04	304	1112.64
		Leased land is optional for plan. Subtract 15 lbs. For residual																	
		from any crop following beans or peanuts.																	
Totals:		*149.87*								*21311.44*							*4496.1*		*25807.54*

Reception Area Specifications

Jenkins Lease

Tract	Field	Irrigated Acreage	Soil Type	1st Crop Code	Time to Apply	1st Crop Yield	1st Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	2nd Crop Code	Time to Apply	2nd Crop Yield	2nd Crop lbs N/Unit	Lbs N/Ac Residual	Lbs N /Ac	Total lbs N Utilized	Total Lbs N/Ac	Total lbs N Utilized
1374	1	52.28	Craven	F	Apr-Aug	775.0	0.12		93	4862.04	*					0	0	93	4862.04
1374	3	12.32	Craven	F	Apr-Aug	775.0	0.12		93	1145.76	*					0	0	93	1145.76
1374	5	4.08	Caroline	F	Apr-Aug	875.0	0.12		105	428.4	*					0	0	105	428.4
1374	6	4.49	Craven	F	Apr-Aug	775.0	0.12		93	417.57	*					0	0	93	417.57
1374	7	4.46	Craven	F	Apr-Aug	775.0	0.12		93	414.78	*					0	0	93	414.78
1374	9	4.41	Craven	F	Apr-Aug	775.0	0.12		93	410.13	*					0	0	93	410.13
1374	10	2.23	Craven	F	Apr-Aug	775.0	0.12		93	207.39	*					0	0	93	207.39
1374	12	5.56	Lenoir	F	Apr-Aug	700.0	0.12		84	467.04	*					0	0	84	467.04
1374	13	7.38	Lenoir	F	Apr-Aug	700.0	0.12		84	619.92	*					0	0	84	619.92
1374	15	1.01	Craven	F	Apr-Aug	775.0	0.12		93	93.93	*					0	0	93	93.93
1374	16	1.19	Caroline	F	Apr-Aug	875.0	0.12		105	124.95	*					0	0	105	124.95
1374	17	11.61	Craven	F	Apr-Aug	775.0	0.12		93	1079.73	*					0	0	93	1079.73
1374	18	6.49	Craven	F	Apr-Aug	775.0	0.12		93	603.57	*					0	0	93	603.57
1374	19	17.97	Craven	F	Apr-Aug	775.0	0.12		93	1671.21	*					0	0	93	1671.21
1374	20	8.43	Lenoir	F	Apr-Aug	700.0	0.12		84	708.12	*					0	0	84	708.12
1374	21	2.3	Craven	F	Apr-Aug	775.0	0.12		93	213.9	*					0	0	93	213.9
1374	22	3.66	Craven	F	Apr-Aug	775.0	0.12		93	340.38	*					0	0	93	340.38
Totals:		*149.87*								*13808.82*							*0*		*13808.82*

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
3272 Farrow to Wean	0.84	2748.48
Farrow to Feeder	1	
Farrow to Finish	4.1	
Wean to Feeder	0.072	
Feeder to Finish	0.36	

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 2748.48 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 13742.4 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 45 acreas of land. If you apply the sludge to corn at a rate of 125 pounds per acre, you will need 109.9392 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
3735	D	Craven	D	0.45	1
3735	1	Craven	D	0.45	1
3735	2	Craven	D	0.45	1
3735	3	Craven	D	0.45	1
3735	4	Craven	D	0.45	1
3735	5	Craven	D	0.45	1
3735	6	Lenoir	D	0.65	1
3735	7	Craven	H	0.45	1
3735	8	Craven	H	0.45	1
3735	9	Craven	H	0.45	1
3735	10	Lenoir	H	0.65	1
3735	11	Craven	H	0.45	1
3735	12	Lenoir	H	0.65	1
3735	Sub1	Craven	D	0.45	1
3735	Sub2	Lenoir	H	0.65	1
3735	Sub3	Craven	H	0.45	1
3735	Sub4	Craven	D	0.45	1
3735	Sub5	Lenoir	D	0.65	1
3735	Sub6	Craven	H	0.45	1

Additional Comments:

This plan revised to show a change in animal type from Farrow-Finish to Farrow-Wean, the addition of pivot D, which replaces pivots A, B & C, and the 35' ditch buffers as required by the NPDES permit.

Fields 1, 4 & 5 are shown to be in a corn, wheat and soybean rotation and these fields may be planted in a small grain cover crop if desired. The application window shall be Sept-Apr with a rate of 30 lbsN/ac. If this cover crop is not harvested, subtract the total amount of N applied to the cover crop from the following crops starting PAN rate.

Millet may be planted in field 1 if desired. The application window shall be Apr-Sept 15 with a rate of 258.5 lbsN/ac. And shall be removed as hay.

Sub-field acreage is the balance of the total field acres minus the wetted acres. This acreage is claimed when making applications with an aerway machine.

Grain sorghum may be substituted for soybeans if desired. The application window shall be Mar 15-Aug with the following rates:

Soil Type	Yield	lbsN/unit	lbsN/ac
Craven	55	2.5	137.5
Lenoir	50	2.5	125
Norfolk	55	2.5	137.5
Caroline	45	2.5	112.5

Note: The leased land is optional. Before applications can be made to these fields, a phosphorus assessment must be completed. Applications may be made in accordance with the findings of the assessment. A "Low or Medium" rating means N based applications. A "High" rating means applications based upon P removal rates of the crops. A "Very High" rating means no application.

NUTRIENT UTILIZATION PLAN CERTIFICATION

Name of Farm: **Farm 8531; Fac. No.: 46-9**
Owner: **Murphy-Brown, LLC**
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: **Murphy-Brown, LLC**

Signature: David Nordini
Date

Name of Manager (if different from owner): _____

Signature: _____
Date

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

Signature: M. Kevin Weston 8/8/2011
Date

NUTRIENT UTILIZATION PLAN

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, recieving 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

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.

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.

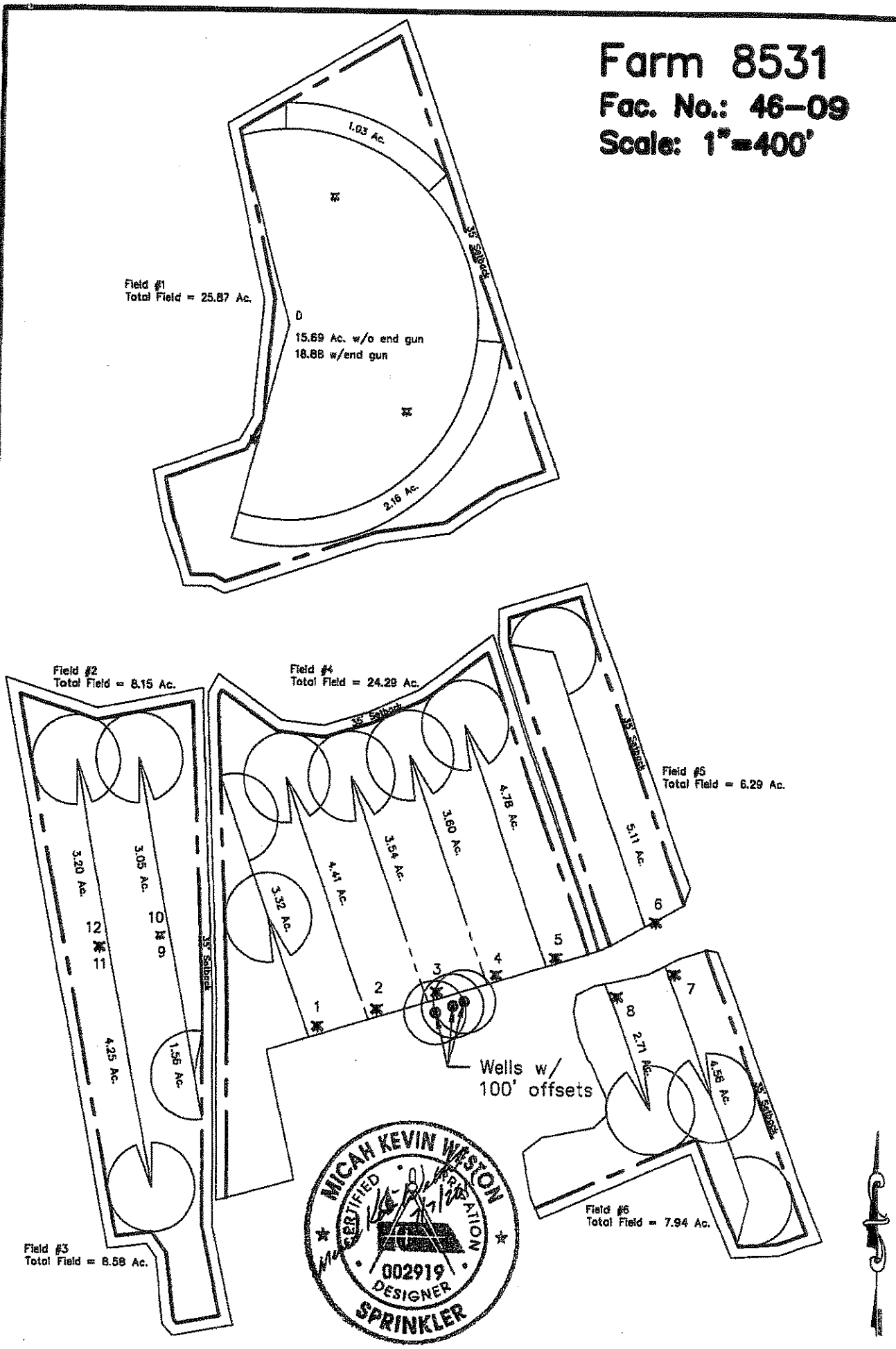
22 Waste shall be tested within 60 days of utilization and soil shall be tested at least annually at crop sites where waste products are applied. Nitrogen shall be the rate-determining nutrient, unless other restrictions require waste to be applied based on other nutrients, resulting in a lower application 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 years.

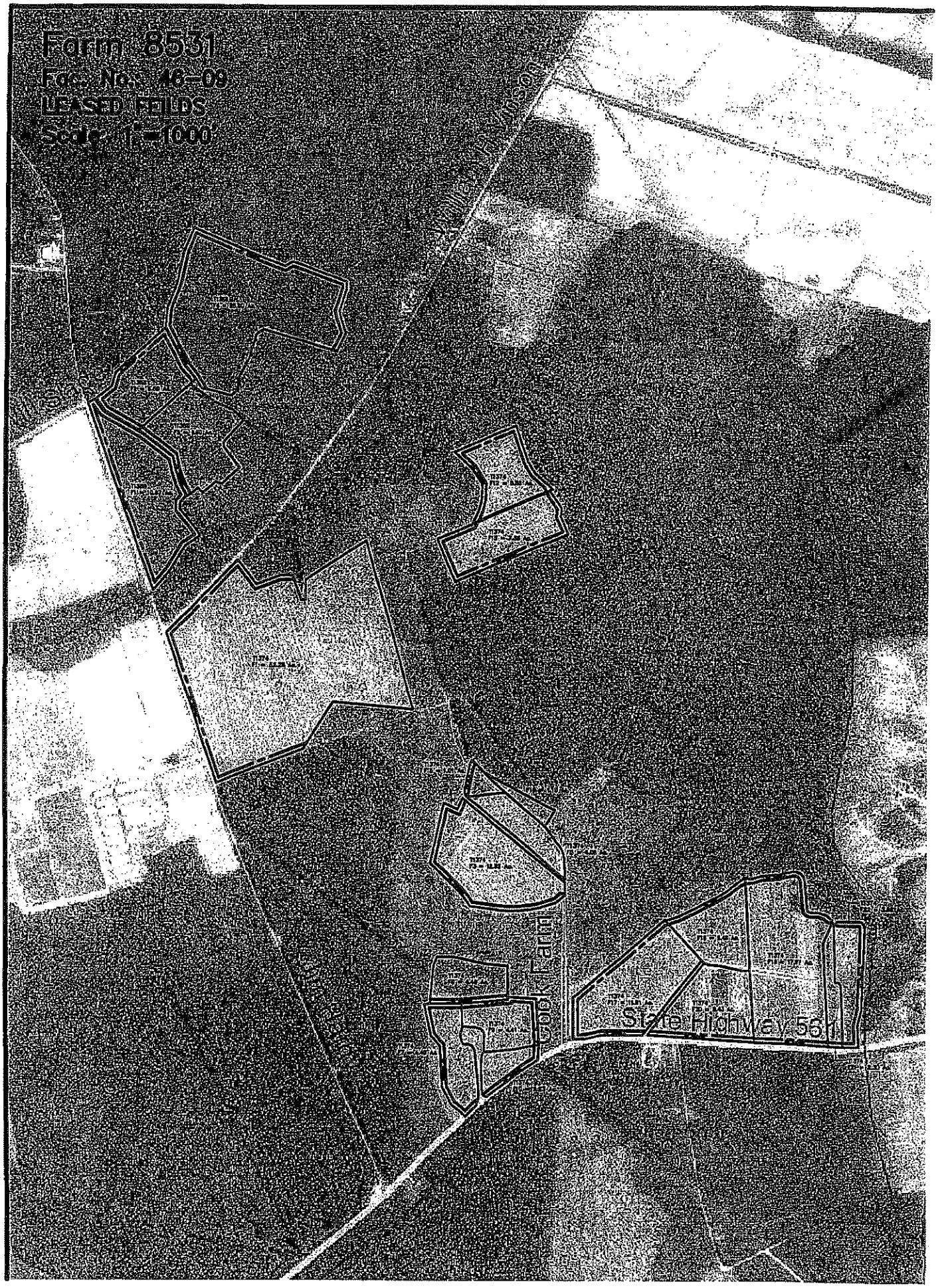
23 Dead animals will be disposed of in a manner that meets North Carolina regulations.

Farm 8531

Fac. No.: 46-09

Scale: 1"=400'



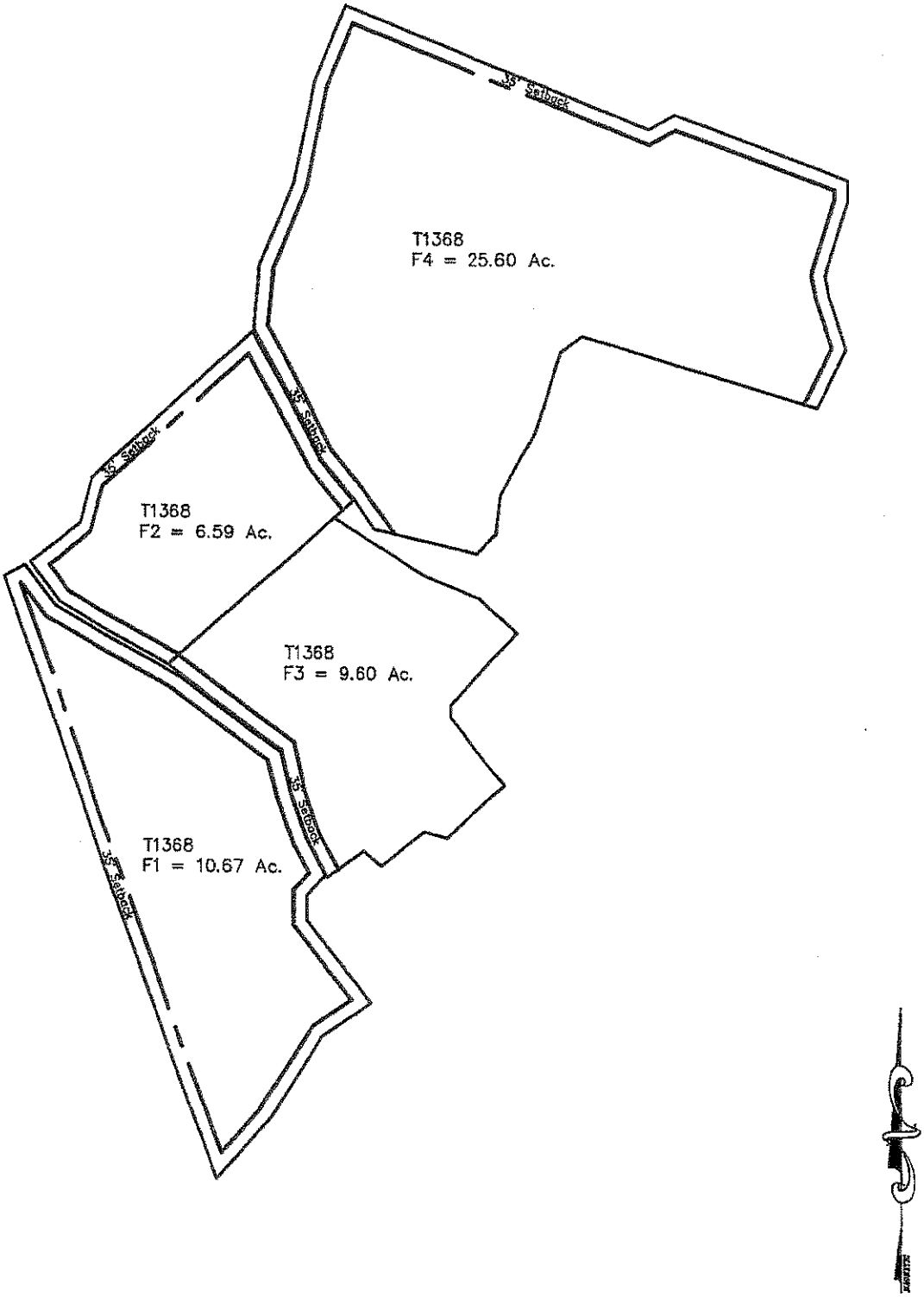

Farm 8531
Fac. No.: 46-09
LEASED FEILDS
Scale: 1"=1000'
Cook Farm
State Highway 561

Farm 8531

Fac. No.: 46-09

LEASED FIELDS

Scale: 1"=400'

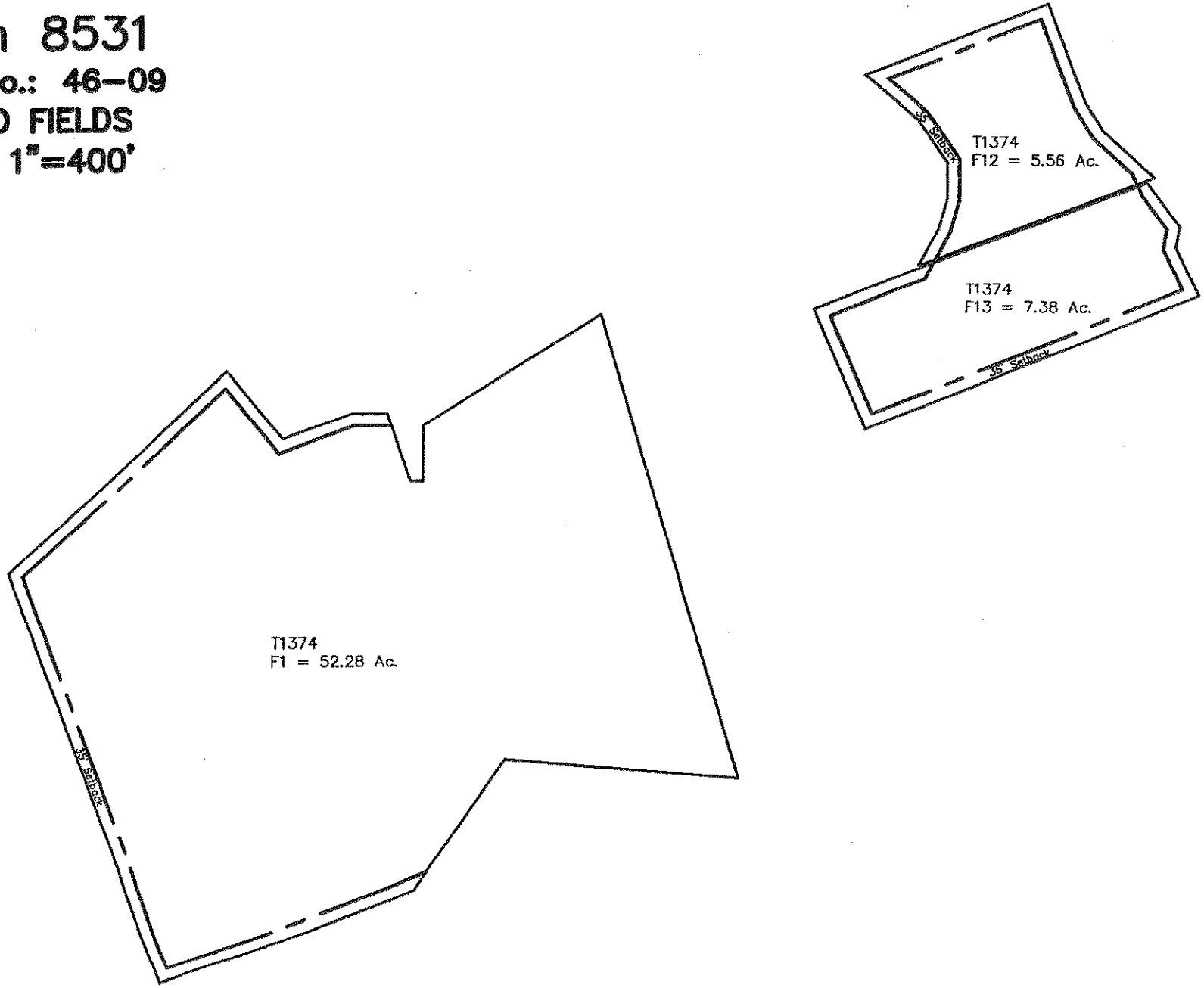


Farm 8531

Fac. No.: 46-09

LEASED FIELDS

Scale: 1"=400'

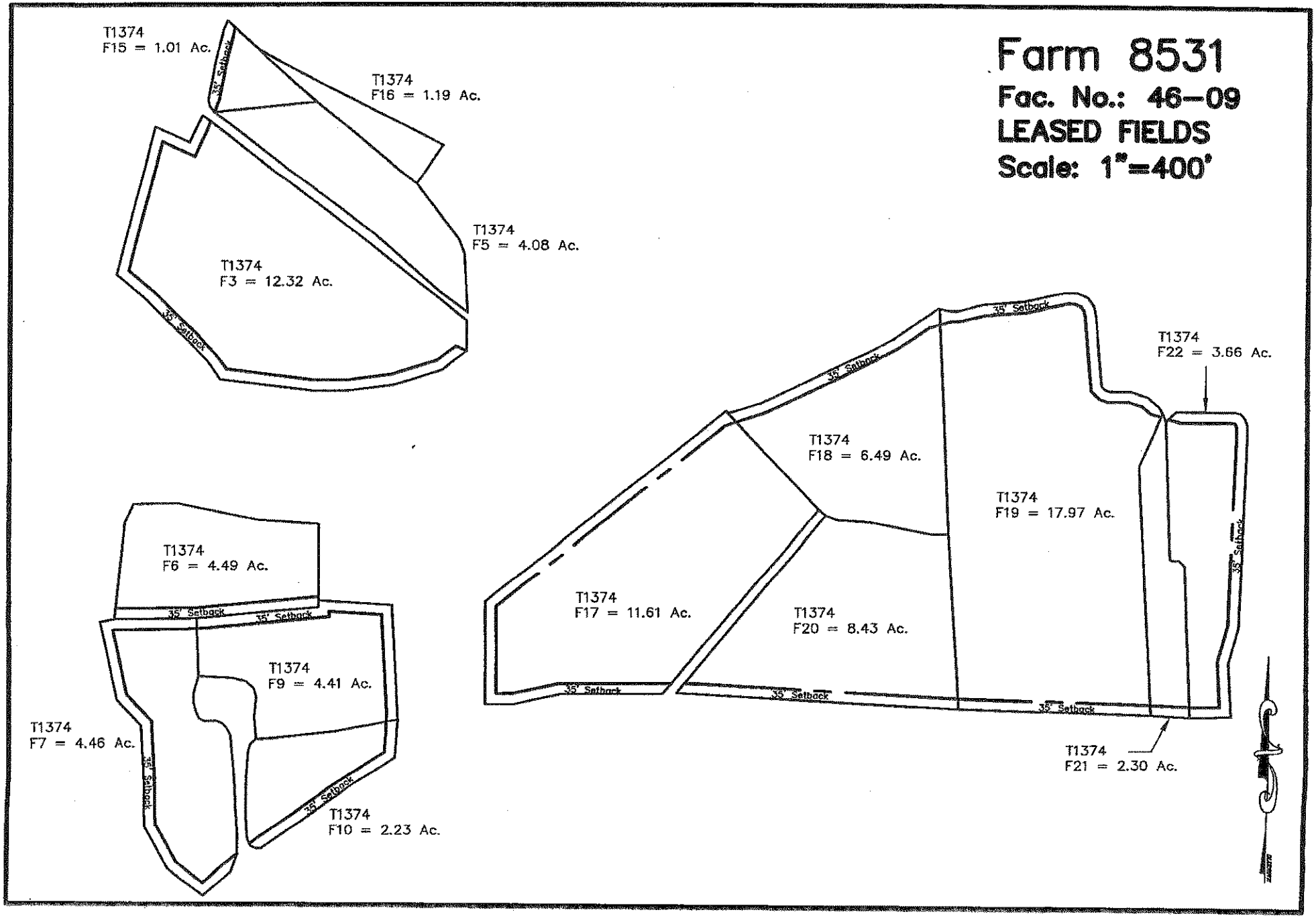


Farm 8531

Fac. No.: 46-09

LEASED FIELDS

Scale: 1"=400'



IRRIGATION SYSTEM DESIGN PARAMETERS

Landowner/Operator Name: Murphy-Brown, LLC - Farm 8531
Address: Waverly Division

County: Hertford

Date: 7/7/2011

Telephone:

Table 1 - Field Specifications

Field Number	Approximate Maximum Useable Size of Field (acres)	Soil Type	Slope %	Crop(s)	Maximum Application Rate (In/hr)	Maximum Application per Irrigation Cycle (inches)	Comments
1	18.88	Craven	0-3	Row Crops	0.5	1	Pivot D
2	6.25	Lenoir	0-3	Fescue	0.5	1	Pulls 10 & 12
3	5.81	Craven	0-3	Fescue	0.5	1	Pulls 9 & 11
4	19.65	Craven	0-3	Row Crops	0.5	1	Pulls 1 - 5
5	5.11	Lenoir	0-3	Row Crops	0.5	1	Pull 6
6	7.27	Craven	0-3	Fescue	0.5	1	Pulls 7 & 8
	62.97						

RECEIVED / DENR / DWQ
Aquifer Protection Section
JUL 12 2011

TABLE 2 - Travelling Irrigation Gun Settings

Make, Model and Type of Equipment: Hobbs Reel Rain travelers, 3.31"x850' hose w/Nelson 150 gun & Valley Center Pivot

Field No. and Hydrant No.	Travel Speed (ft/min)	Application Rate (in/hr.)	TRAVEL LANE Effective Width(ft.)	TRAVEL LANE Effective Length(ft)	Wetted Diameter (feet)	Nozzle Diameter (Inches)	Operating Pressure at Gun(psi)	Operating Pressure at reel(psi)	Arc Pattern	Comments - Acres per pull
1	6.32/3.45	.76/.41	100/240	325/256	280	1.08	70	90	180/330	3.32
2	3.45	0.41	200	734	280	1.08	70	90	330	4.41
3	3.45	0.41	200	544	280	1.08	70	90	330	3.54
4	3.45	0.41	200	557	280	1.08	70	90	330	3.60
5	3.45	0.41	240	665	280	1.08	70	90	330	4.78
6	3.45	0.41	249	763	280	1.08	70	90	330	5.11
7	5.06/3.45	0.62/0.41	222/240	343/298	280	1.08	70	90	220/330	4.56
8	3.45	0.41	240	280	280	1.08	70	90	330	2.71
9	6.32	0.76	150	453	280	1.08	70	90	180	1.56
10	3.45	0.41	240	553	280	1.08	70	90	330	3.05
11	3.45	0.41	240	772	280	1.08	70	90	330	4.25
12	3.45	0.41	240	581	280	1.08	70	90	330	3.20
D	Center Pivot - acreage computer calculated - 609.2' w/81.9' end gun radius									18.88
								TOTAL		**62.97**

TABLE 3 - Solid Set Irrigation Gun Settings

Make, Model and Type of Equipment N/A

Field No and Line No.	Number of Hydrants	Wetted Diameter (feet)	Hydrant Spacing(ft) Along Pipelines	Hydrant Spacing(ft) Between Pipelines	Application Rate (in/hr)	Operating Parameters: Nozzle Diameter (inches)	Operating Parameters: Operating Pressure at Gun(psi)	Operating Parameters: Operating Time at Hydrant(hr.)	Comments-Acres per zone
	0								
								TOTAL	**0.00**

TABLE 4 - Irrigation System Specifications

	Traveling Irrigation Gun	Solid Set Irrigation
Flow Rate of Sprinkler (gpm)	197	0
Operating Pressure at Pump (psi)	114.5	#DIV/0!
Design Precipitation Rate (in/hr)	0.38	0.00
Hose Length (feet)	850	XXXXXXXX
Type of Speed Compensation	Mechanical	XXXXXXXX
Pump Type (PTO, Engine, Electric)	Engine	Engine
Pump Power Requirement (hp)	26.3	#DIV/0!

TABLE 5 - Thrust Block Specifications			
	6"	4"	2"
	THRUST BLOCK	THRUST BLOCK	THRUST BLOCK
LOCATION	AREA (sq. ft.)	AREA (sq. ft.)	AREA (sq. ft.)
90 degree bend	8.8	4.3	1.1
Dead End	6.2	3.0	0.8
Tee	4.4	2.1	0.5
Gate Valve	6.2	3.0	0.8
45 degree bend	4.7	2.3	0.6

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

MICAH KEVIN WESTON
CERTIFIED IRRIGATION
002919
DESIGNER
SPRINKLER

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 redesign of the pulls, an addition of a new center pivot, and a "wetted 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. The new Valley center pivot replaces the Zimmatic towable pivot (hyds A, B & C). Benchmark Buildings & Irrigation, Inc. designed and installed this pivot.

This irrigation system is designed with six inch, Class 200 PVC and schedule 80 fittings. The system is designed to accommodate the flow velocities, flow rates and pressure requirements associated with a Hobbs Reel Rain traveler and a Zimmatic towable pivot. Air vents and thrust blocks are to be installed as indicated on the drawings. Air vents will consist of using a 6"x2" saddle with a 2" galvanized threaded pipe and an AV 150. The thrust block areas have been calculated and are listed in Table 4 of this design. The design of the traveler system requires the use of a 1.08" ring nozzle in the gun. Each pull has a specific arc setting and travel speed which must be used to achieve the desired application. This information is given in Table 2 of this design. A detail of the hydrant layout is also included. All pipe shall be installed with a minimum of 30" of cover and shall be backfilled in no less than three passes, leaving enough soil material above original grade to allow for settling. The suction assembly for the pump to be used should be a minimum of 6" aluminum. A pressure gauge should be installed on the discharge side of the pump where it can be seen during start up of the system.

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

This revision, 5/10/2011, is due to the inclusion of 35' buffers from ditches as required by the NPDES permit, and revised on 7/7/2011 to include the addition of the new Valley Center Pivot.

CALCULATIONS

Sprinkler Specifications

Sprinkler Type:	Nelson 150	
Nozzle Size:	1.08 inches	
Sprinkler Pressure:	70 psi	
Flowrate(GPM):	197 gpm	
Wetted Diameter:	280 feet	* Reflects a 10% reduction from chart

Lane Spacings

Desired Spacing (%):	70 %	
Design Spacing(feet):	196	*PVC irrigation pipe normally comes in 20' pieces, so round to the nearest multiple of 20.
Actual Spacing (feet):	200 feet	
Actual Spacing (%):	71 %	

Application Rate

Application Rate = (96.3xFlowrate)/(3.1415x(.9xradius)squared)

Design App. Rate = 0.38 in/hr

300 degree arc =	0.46 in/hr	330 degree arc =	0.41 in/hr
220 degree arc =	0.62 in/hr		
180 degree arc =	0.76 in/hr		

Traveller Speed

Travel speed = 1.605 x Flowrate / Desired application amount x Lane Spacing

Desired app. (in.) =	0.5 inches	360 degree arc =	3.16 ft/min
300 degree arc =	3.79 ft/min	330 degree arc =	3.45 ft/min
220 degree arc =	5.06 ft/min		
180 degree arc =	6.32 ft/min		

Mainline Velocity

Velocity = .408 x Flowrate / pipe diameter squared feet/sec.**
**For buried pipelines, velocity should be below 5 feet per second

Pipe size: 6 inches

Velocity= 2.23 ft/sec.

Maximum Mainline Friction Loss

Most distant hydrant:
Total distance: 2000 feet

Friction Loss is figured using Hazen/William's Equation

Friction Loss= 0.28 feet/100 feet

Max. Mainline Loss = 5.6 feet or 2.4 psi

Total Dynamic Head

Sprinkler Pressure:	70 psi		
Loss through traveller:	30 psi		
Elevation head:	4.3 psi		
Mainline loss:	2.4 psi		
Suction head and lift:	2.3 psi		
5% fitting loss:	5.5 psi		
TOTAL(TDH) =	114.5 psi	or	264.5 feet

Horsepower Required

Horsepower = Flowrate x TDH(feet) / 3960 / Pump effeciency

Pump Description:
Pump Efficiency: 50 %

Horsepower Required: 26.3 Hp

Thrust Blocking

Thrust Block Area = Thrust / Soil Bearing Strength

Thrust: 7460 feet
Soil Bearing Strength: 1200 feet

End Cap: 6.2 ft2
90 degree elbow: 8.8 ft2
Tee: 4.4 ft2
45 degree elbow: 4.7 ft2

Pipe Pressure Rating Check

Pressure Rating of Pipe to be Used: 200 psi
Max. Pressure on system when running: 114.5 psi
70% of Pressure Rating: 140 psi

If Max. Pressure on system is less than 70% of Pressure Rating, OK

Net Positive Suction Head Check

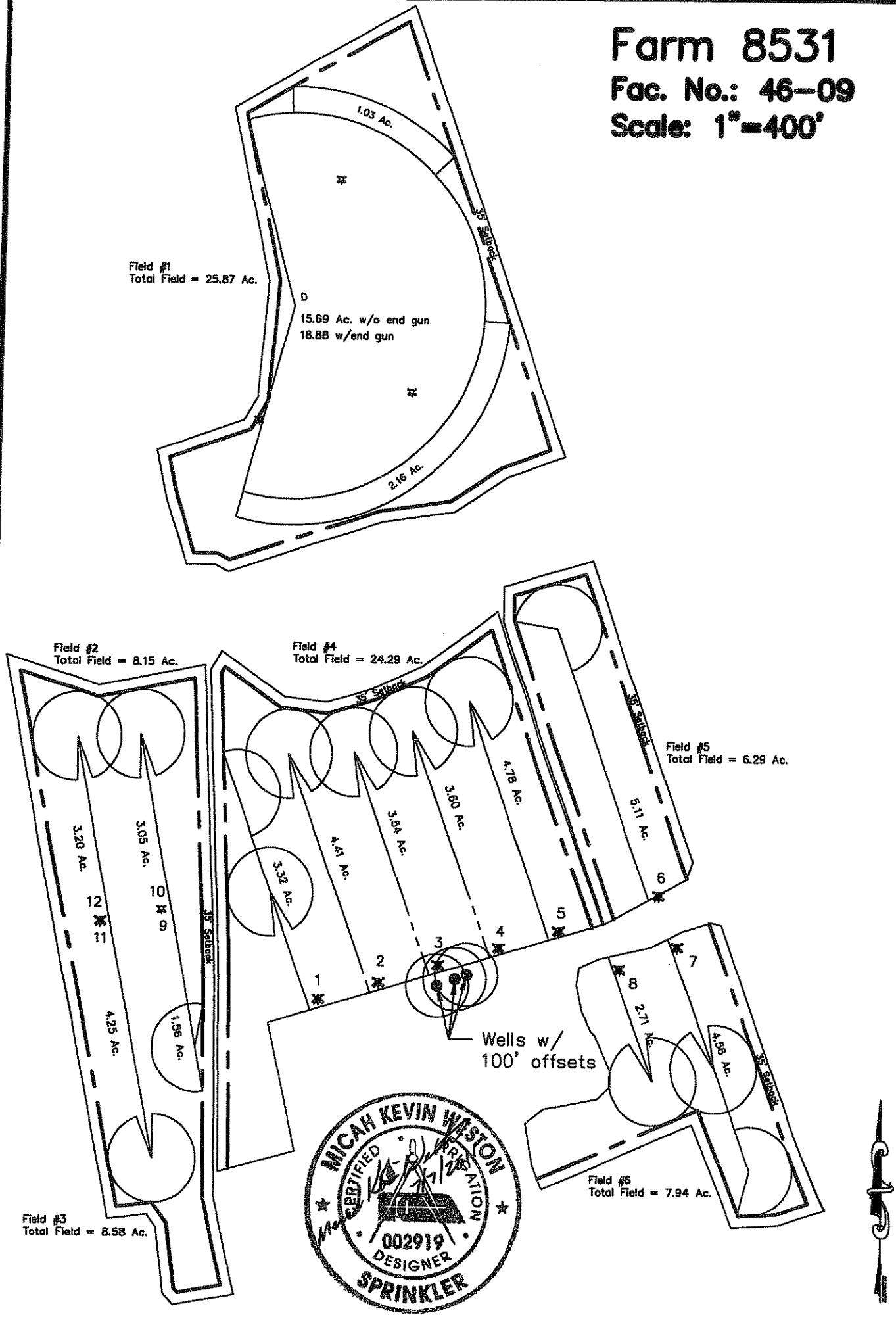
NPSHA:

NPSHR: *from pump curve

If NPSHA>NPSHR OK

			Farm 8531					
			Acreage Calculations - 5/10/2011					
	Width	Length	Acres	Total Acres	Start End	Stop End		Total
Pull #	(ft.)	(ft.)	(midsection)	(midsection)	(ac.)	(ac.)		Pull Acres
1	100	325	0.746	2.157	0.644	0.524		3.32
	240	256	1.410	0.000	0.000	0.000		0.00
2	200	734	3.370	3.370	0.576	0.466		4.41
3	200	544	2.498	2.498	0.576	0.466		3.54
4	200	557	2.557	2.557	0.576	0.466		3.60
5	240	655	3.609	3.609	0.644	0.524		4.78
6	249	763	4.362	4.362	0.513	0.240		5.11
7	222	343	1.748	3.390	0.644	0.524		4.56
	240	298	1.642	0.000	0.000	0.000		0.00
8	240	280	1.543	1.543	0.644	0.524		2.71
9	150	453	1.560	1.560	0.000	0.000		1.56
10	240	553	3.047	3.047	0.000	0.000		3.05
11	240	772	4.253	4.253	0.000	0.000		4.25
12	240	581	3.201	3.201	0.000	0.000		3.20
	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
	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
	0	0	0.000	0.000	0.000	0.000		0.00
						Total Acres		**44.09**

Farm 8531

Fac. No.: 46-09

Scale: 1"=400'