APPENDIX A

Nutrient

Management Plan

For

Wulf Cattle Depot

Corson County, SD

Prepared by DeHaan, Grabs & Associates, LLC,
Mandan, ND

October 2020

Nutrient Management Plan
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Section A: Narrative

1. Introduction for Wulf Cattle Depot Nutrient Management Plan

This Nutrient Management Plan was developed for Wulf Cattle Depot, which was Corson County Feeders and the relevant parts of the Corson County Feeders CNMP plan have been used in this NMP. The site is located on the east side of McLaughlin, South Dakota, from the intersection of US Highway 12 & State Highway 63, go 1/2 mile north & 1/2 mile east. The feedlot is located on the south side of the road. The facility is an open lot beef feedlot that has a maximum capacity of 12,400 head of livestock. This Nutrient Management Plan was developed as a joint effort between Wulf Cattle Depot, the Natural Resources Conservation Service (Items from old CNMP plan were used), and DeHaan, Grabs & Associates, LLC.

The total available for crop uptake of N (231,426 lbs) and available P_2O_5 (735,475 lbs) produced annually by the livestock was determined by DeHaan, Grabs & Associates, LLC using SD-CPA-63A. The Holding Ponds have capacity of 22,763,595 gallons (this includes a small portion of the basins) within the freeboard level. The Holding Ponds have capacity at the Maximum Operating Elevation of 11,218,511 gallons. The volume between the Freeboard and the Maximum Operating Elevation is 11,545,084 gallons. This will be applied through center pivot irrigation. The rate will be calculated in accordance to the crop needs using the SD-CPA-63. The NMP includes 7,551.9 acres of agricultural land, most of which is available for manure application. After excluded acres the land available on a nitrogen basis is approximately 7,312.3 acres. The typical crops grown will be rotated in various sequences to complete a sound agronomic rotation. It is important to remember that the rotation will be adjusted based off of market forces, weather, feed requirements, economic influences, etc. When calculating projected land base requirements and RUSLE 2 calculations, Corson County average yields x 110% was used. When calculating annual nutrient application needs, actual yields on a per field basis will used. P_2O_5 is in excess of removal. At this rate, it will take approximately 8 years to build all listed fields up to 50 ppm P_2O_5 (Olsen).

The record keeping section is important for the proper application of nutrients from the facility. Records of commercial fertilizer will also be maintained. The facility will maintain the following documentation from each application of manure or wastewater: current soil sample analysis, current manure or wastewater analysis, records showing equipment calibration, a Water Quality Risk Assessment (WQRA) map showing actual area application, and a completed SD-CPA 63 summary showing calculated application rate based on South Dakota State University (SDSU) recommendations.

Comprehensive Nutrient Management Plan

The Comprehensive Nutrient Management Plan (CNMP) is an important part of the conservation management system (CMS) for your Animal Feeding Operation (AFO). This CNMP documents the planning decisions and operation and maintenance for the animal feeding operation. It includes background information and provides guidance, reference information and Web-based sites where up-to-date information can be obtained. Refer to the Producer Activity document for information about day-to-day management activities and recordkeeping. Both this document and the Producer Activity document shall remain in the possession of the producer/landowner.

Farm contact information: Wulf Cattle Depot, (Lucas Sutherland) 605-823-4467
PO Box 560
McLaughlin, SD 57642

Latitude/Longitude: 45.816N & 100.8069W
Plan Period: 2020-2024
Animal Type: Beef

Animal Units: 12,400

Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: _____ Date: 10/3/2020
Name: Riverview, LLP, Dba Wulf Cattle Depot

Conservation Planner

As a Conservation Planner, I certify that I have reviewed both the Comprehensive Nutrient Management Plan and Producer Nutrient Management Activities documents for technical adequacy and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: Nathan Pesta Date: 10/3/2020
Name: Nathan A. Pesta, P.E.
Title: Senior Project Engineer

Manure and Wastewater Handling and Storage

Signature: Nathan Pesta Date: 10/3/2020
Name: Nathan A. Pesta, P.E.
Title: Senior Project Engineer

Nutrient Management

The Nutrient Management component of this plan meets the SD Nutrient Management 590 Practice Standard.

Signature: Nathan Pesta Date: 10/3/2020
Name: Nathan A. Pesta, P.E.
Title: Senior Project Engineer

Nutrient Management Plan Contact Information

a. Facility:

NAME:	Wulf Cattle Depot
ADDRESS:	PO Box 659 400 Sale Barn Road McLaughlin, SD 57642
PHONE NUMBER:	(605) 823-4467
EMAIL:	lucas@wulflimousin.com
MANAGER:	Lucas Sutherland

b. Owners:

NAME:	Riverview LLP, Dba Wulf Cattle Depot
ADDRESS:	26406 470th Ave Morris, MN 56267
PHONE NUMBER:	(320) 392-5319

c.	**NMP Developed by:**	DeHaan, Grabs & Associates, LLC
	NAME:	Nathan A. Pesta
	ADDRESS:	4200 21st St SE #101 Mandan, ND 58554
	PHONE NUMBER:	(701) 663-1116
	CELL NUMBER:	(701) 400-3950

d. Legal Location of Facility
NE-1/2, Section 5, T-21-N, R-27-E, Corson County, SD

e. NUTRIENT MANAGEMENT PLAN INFORMATION

Type of Livestock:…… Beef
Number of head: …… 12,400
Average Weight:……650 lbs

Total Number of
Acres Included in NMP after excluded acres:…….7,312.3 acres
Is this Permitted:……Permitted by EPA

References

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

☒ **South Dakota State General Water Pollution Control Permit for concentrated animal feeding operations dated** *October 20, 2003*

☒ **USDA, Natural Resources Conservation Service (NRCS) conservation practice standard** *Nutrient Management ("590")* **dated** *December 2007*

☒ *Fertilizer Recommendations Guide, EC750, September 2005* **Fertilizer Recommendations Guide, using SD-CPA-63**

☒ *Interpreting a Soil Test Report, AGF-514-12* **Determining the Nutrient Balance**

Land Base

The nutrient management plan includes a sufficient land base to meet the Nitrogen (N)-based and/or Phosphorus (P)-based manure application requirements. P-based levels for spreading manure generally requires a significantly greater land base the N-based. When necessary, fields targeted for phosphorus-based manure application are identified in the **Manure Application Planning** section of this plan.

5. Site Specific Information

a) Operation Description

Wulf Cattle Depot is a typical open lot feedlot that has been in operation for many years. The facility currently consists of approximately 98.5 acres of open lots for the confined feeding of 12,400 head of cattle weighing greater an average of 650 lbs. There are four separate drainage areas which include a combination of sediment basins, diversions and holding ponds. The feed storage area is also contained in Area 3. The Irrigation center pivot is located to the southeast of the facility. The Holding Ponds are connected by 8" crossover pipes that are un-gated.

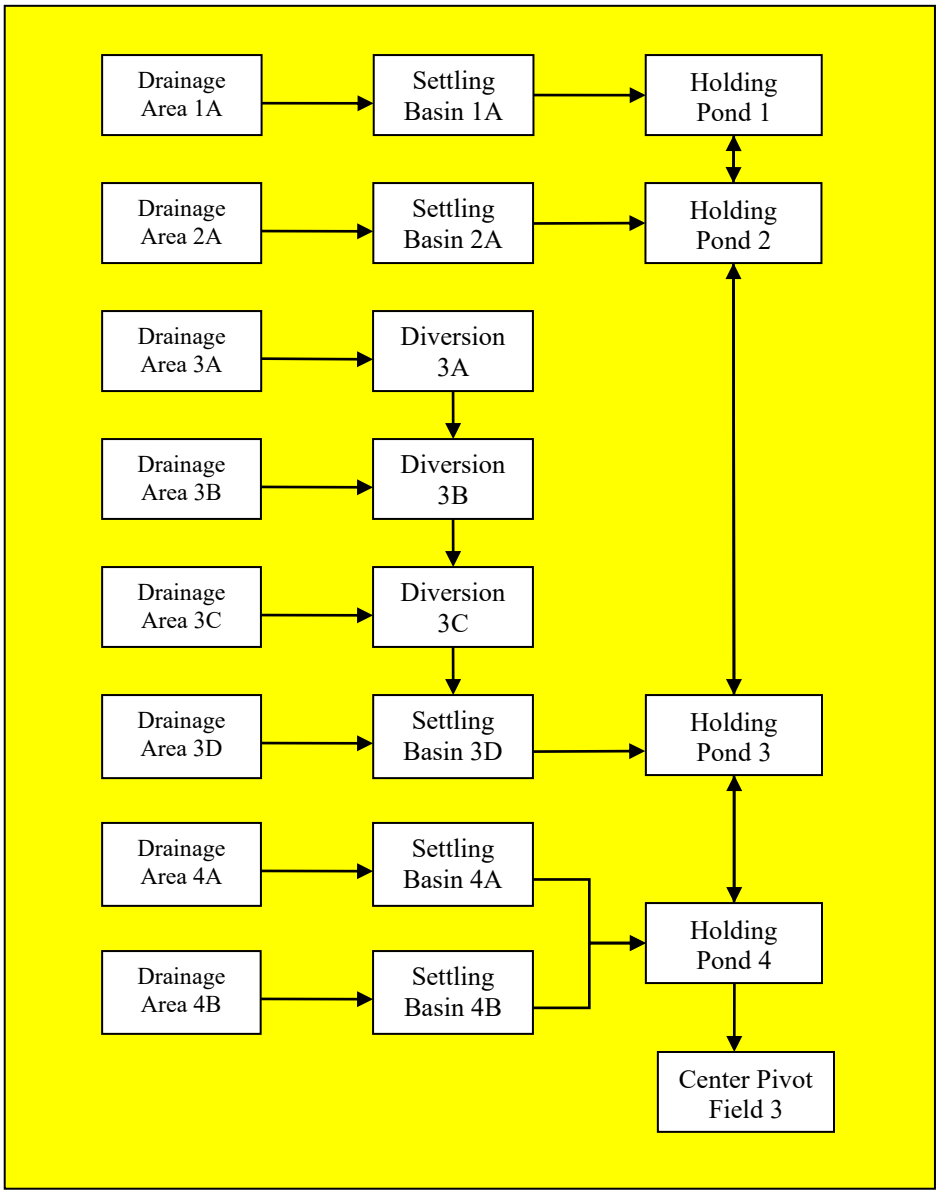
Area 1 utilizes one pen diversion to direct the flow to Settling Basin 1A before discharging into Holding Pond 1. Settling Basin 1 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 1 into Holding Pond 2 through gravity.

Area 2 will utilize three pen diversions and two basins (Basin 2A and Basin 2B) to direct the flow before discharging into Holding Pond 2. Settling Basin 2 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 2 into Holding Pond 3 through gravity.

Area 3 will utilize four diversions to direct the flow to Settling Basin 3D before discharging into Holding Pond 3. Included in this area is the working facility and half of the feed storage area. Settling Basin 3 is designed with a perforated riser to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. The basin outlet utilizes concrete splash-pads to discharge the runoff into the pond. An 8" crossover pipe connects the effluent from Holding Pond 3 into Holding Pond 4 through gravity.

Area 4 will utilize two diversions direct the flow to Settling Basin 4B, before discharging into Holding Pond 4. In addition Settling Basin 4A collects the runoff from pen 100 before discharging into Holding Pond 4. The settling basins are designed with perforated risers to slow down the runoff, store the annual amount of solids and pass the 25-year, 24-hour storm into the holding pond. A floating pump is used to pump the effluent to a center pivot on Field 3.

The following is a drainage flow description for the feedlot:



The facility operates within the *Lake Oahe* watershed. The Hydrologic Unit Code(s) and corresponding Water Quality Impairment(s) for the production area and land application fields include: *Huc8 – 10130102. Impairment type is 303D.*

b) Manure Management Description

The storage period as shown below is 365 days.

c) Estimated Solid Manure:

Estimates of solid waste was used based off historical data from the feedyard.

12,400 hd beef cattle X 8.4 lbs/hd/day ÷ 2,000 lbs/ton X 365 days/year = 19,000 tons/year

d) Estimated Liquid Manure:

Wastewater estimates were determined by developing hydrologic balances using expected annual rainfall, evaporation, and runoff values from The Climatography of the US no 81, 1971-2000, NRCS Figure 10C-8, and AWM Datatabase, McLaughlin Station).

Total Area
Total Area (153.3 acres) X Annual Runoff (CN 86) (2.7") + Annual Rainfall on Pond (17.4") X Area of Pond @FB (375,222 ft^2) –Evaporation (33.7") X Average Evaporation Area (219,917 ft^2) = **10,688,702 gallons = 1,428,971 ft^3**

Estimated Annual Manure Generation for Land Application (based on records for solids)

Type	Amount
Solid Manure	*19,000* Tons
Liquid Manure	*10,688,702* Gallons

e) Manure Management

100% of the waste generated at the facility will be land applied. Wulf Cattle Depot owns, leases or has manure application agreements of land of 7,551.9 acres for manure solids application. Wulf Cattle Depot has a lease or owns land for 223.6 acres for application of liquid from the runoff holding ponds. (Manure Easements in Section H) Please refer to the facility maps to see exact location of these fields and their descriptions. The solid waste will be land applied to include the sludge from the runoff holding ponds.

The liquid will be applied through two center pivot systems on crop land. Liquid will be pumped to these fields using an existing underground pipeline going to Field 3, 12B and 47B.
A floating electrical pump is located in Holding Pond 4. All effluent can gravity drain to Holding Pond 4 with crossover pipes.

f) Equipment Available

Equipment Description (55 hp tractor, pto driven pump, honey wagon, center pivot, traveling gun, etc.)	Equipment Purpose (transport, collection, land application, agitate manure in basin, etc.)	Capacity (gallons per minute, gallons, bushels, acres, cubic yards, etc.)	Owned (O), Leased (L), or Contracted (C)
Holding Pond 4 Pump	Transport to Pivot on Field 3, 12B & 47B	450 GPM	(L)
Side Dump	Transport to Field	16 Cubic Yards	(O)
Pay Loader	Transport to Side Dump & Spreader	6.5 Cubic Yards	(O)
Manure Spreader	Land Applied to field	16.5 Ton Spreader	(C)

6. Land Application Rate Methodology

This facility chooses the "narrative" rate approach for expressing nutrient application rates. Thus, the methodology outlined in this Section will be adhered to each year for determining nutrient application rates, as a term of the permit. Intended crop rotations are listed for each field in Section C. SD-CPA-63; however, any crop may be planted, if necessary.

Limitations on application rates, as determined in accordance with the Nutrient Management Code 590, Table 1 and are shown in Section D, Table D.1. Maximum nutrient application rates are determined based on the following assumptions:

- The amount of N and P in the manure that will be plant available is determined based on manure nutrient sampling results.

- Nitrogen application rates (commercial fertilizer + plant available manure N) will not exceed crop N requirements minus N credits:

  Crop N Uptake
  – Organic Matter N Mineralization
  – Past Year Legume N Credit
  – Past Year Manure N Credit
  – Soil Residual N

  Total N Application
  (Manure + Commercial Fertilizer)

  Nitrogen credits include organic matter mineralization, past year legume credits, past year manure credits, and soil residual N, are based on South Dakota State University) (SDSU) recommendations, using the SDSU EC 750 "Fertilizer Recommendations Guide" that is established in the SD-CPA 63 program. If allowable application rates are P based, P application rates from both commercial fertilizer and plant available manure P will be based on the crop P uptake listed in SD-CPA 63.

Examples of the above calculations are included in SD-CPA-63, Section C. Included in SD-CPA-63 are maximum application rates of manure per field. Also included are projections of manure applications and field nutrient balances for the next five years.

7. Nine Minimum Standards

a) Adequate Storage Verification

Manure, litter, and process wastewater storage structures shall be designed, operated, and maintained as described in Sections A and B of the permit to ensure no discharges to waters of the State.

All of the control structures were designed and built to control the runoff from a *25*-year, *24*-

hour storm event (*3.9* inches) and annual rainfall and runoff as shown in the Appendix for Calculations. The maximum volume that was calculated was 2,942,090 ft^3 and the volume provided as shown in Section M.2 is 3,043,261 ft^3

b) Management of Mortalities

Mortalities shall not be disposed of in any liquid manure, storm water, or process wastewater system and shall be handled in such a way as to prevent the discharge of pollutants to surface or groundwater.

Mortalities will not be disposed of in any liquid manure, store water or process wastewater system and will be handled in such a way as to prevent the discharge of pollutants to surface or groundwater. The method for disposing of routine mortalities is cremation. Prior to disposal to the cremator these animals will be hauled to and kept in a specified area, within the facility footprint, that is easily accessible to the truck used for transport to the cremator and is not open to public view. In the case of the cremator not working, burial is the secondary method. The burial site will have soils that shall provide an adequate clay liner to protect groundwater, ensure biosecurity, and avoid creating nuisance conditions. Burial location is shown in Section R.1.

Catastrophic mortalities due to natural disasters may be handled differently than catastrophic mortalities due to foreign animal disease. In either case, the EPA Region 8 will be contacted for assistance prior to any disposal at 303-312-6312. In case of a catastrophic mortality event, Wulf Cattle Depot will contact EPA to help select a proper burial site. This site will have soils that shall provide an adequate clay liner to protect groundwater, ensure biosecurity, and avoid creating nuisance conditions. The incineration location is shown in Burial location is shown in the Burial location is shown in Section R.2.

c) Diversion of Clean Water from Production Area

Clean water shall be diverted, as appropriate, from the production area.

Freshwater runoff is diverted from the production by natural topography, diversion berms, channels, and/or waterways. Any runoff that is not diverted is retained by retention structures.

Various inspections will be conducted by the facility operator in order to ensure compliance. Storm water diversion devices, runoff diversion structures, and devices channeling contaminated storm water to the wastewater and manure storage and containment structure will be inspected weekly. Water lines, including drinking and water or cooling lines will be visually inspected daily. These inspections will be documented on the Monthly Operations Reports. Corrective action taken during any inspections will be documented on the Monthly Operations and Annual Report as well. Natural topography and Diversion locations are shown in Section R.1.

d) Prevention of Direct Contact between Livestock and Surface Waters

Confined animals shall be prevented from having direct contact with waters of the United States.

Wulf Cattle Depot will limit the potential for contact of livestock with surface water by making

sure all livestock are kept fenced in. The facility does not have any surface water flowing through any of the pens where livestock are kept.

e) Chemical Handling

Chemicals and other contaminants shall not be disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.

Wulf Cattle Depot will ensure that chemicals (including but not limited to herbicides, insecticides, pharmaceuticals, petroleum products, and cleaners) handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system. The facility will also work towards minimizing the use of potentially harmful chemicals/contaminants and ensure these products are used according to their labels and disposed of properly. Chemicals are stored in the shop as shown R.1.

f) Conservation Practices to Reduce Nutrient Loss

Site-specific conservation practices shall be implemented to control runoff of pollutants to waters of the United States.

Liquid livestock wastes will not be land applied during a precipitation event, or when the ground is frozen, snow covered, or saturated. Manure, litter, and process wastewater will not be applied closer than 100 feet to any down-gradient surface water, open tile line intake structure, sinkhole, agricultural well head or other conduits to surface water unless an approved compliance alternative is in place. Table D.1 identifies site-specific setbacks, buffers, and/or other waste application limitations for each field. Maps included in Section F, identify the locations of all setbacks. Section I includes all conservation practices in detail.

g) Protocols for Manure and Soil Testing

Manure, litter, process wastewater, and soils shall be tested following protocols as shown in Section O: Manure Application Planning.

Soil samples will be collected and prepared according to the FS 935, "Recommended Soil Sampling Methods for South Dakota". Testing will be conducted by an Agvise Laboratories using analytical procedures. Agvise Laboratories is located at 902 13 Street North, P.O. Box 187, Benson, MN 56215. Soil sampling areas will be taken from uniform areas. A certification of the location and number of representative cores collected from the field will be submitted with each soil test. A representative number of cores will be taken from each area by either of the following methods:

- Soil sample cores will be taken to a depth of 24 inches. The top 6 to 8 inches of each core will be combined to obtain a surface sample. The remaining portions of each core will be combined to obtain a profile sample. The surface sample will be tested for organic matter, pH, phosphorus, potassium, and nitrate-N. The profile sample will be tested for nitrate-N.

- Surface and profile samples will be obtained from separate cores. Surface sample cores will be taken to a depth of 6 to 8 inches and will be tested for organic matter, pH, phosphorus, and potassium. Profile soil sample cores will be taken to a depth of 24 inches and will be tested for nitrate-N.

Each field will have a surface soil test taken within 12 months prior to the first year of a new plan, and thereafter a minimum of every three years, when used for land application of manure, litter, or process wastewater. Annual testing will be conducted during the permit cycle if manure, litter, or process wastewater is applied two or more consecutive years. Profile soil samples will be taken within 12 months prior to any land application of manure, litter, or process wastewater.

Manure, litter, compost, and process wastewater will be analyzed a minimum of once annually for total nitrogen, organic nitrogen, ammonium-nitrogen, phosphorus, and moisture content. Manure samples will be collected, prepared, stored and shipped in accordance with Fact Sheet SD-NRCS-FS-36, "Sampling Manure for Nutrient Management"; this can be found in Section O. Testing will be conducted by either "Minnesota Valley Testing Laboratories, Inc, South Dakota State University testing lab or Dairyland Laboratories, Inc. A form for the SDSU testing lab is located in Section O.

H) Protocols for Land Application of Manure and Wastewater

Manure, litter, and process wastewater shall be land applied at agronomic rates, in accordance with the South Dakota State University,(SDSU) recommendations, using the SDSU EC 750, on fields specified in the approved Nutrient Management Plan as calculated and shown in the SD-CPA-63 planner. It is to note that SD-CPA-63 planner, mineralization and legume rates were planned by Ron Gelderman, soil testing program manager SDSU Plant science Department

Table D.1 lists fields under control of the facility that may potentially receive livestock waste applications during the course of the five-year NMP period. The spreadable acres listed for each field take into account any setbacks or buffers that would reduce the field acres. The Nitrate Index assesses the potential risk for loss of N from the field.

All waste application equipment will be calibrated annually to ensure that application rates are accurate. All equipment and components of the waste management systems will be checked on a regular basis. Certain items such as holding pond operating levels will be monitored weekly. Other items such as pipelines and application equipment will be monitored during application periods.

I) Recordkeeping

Records shall be maintained which document the implementation and management of this NMP. Guidelines are shown in Section N of this plan and are documented Section C. SD CPA 63 planner.

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Form Approved
OMB No. 2040-0250

EPA I.D. NUMBER (*copy from Item 1 of Form 1)*

FORM 2B NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATIONS FOR PERMIT TO DISCHARGE WASTEWATER
CONCENTRATED ANIMAL FEEDING OPERATIONS AND AQUATIC ANIMAL PRODUCTION FACILITIES

I. GENERAL INFORMATION Applying for: Individual Permit ☐ Coverage Under General Permit ☐

A. TYPE OF BUSINESS	B. CONTACT INFORMATION	C. FACILITY OPERATION STATUS
☐ 1. Concentrated Animal Feeding Operation (complete items B, C, D, and section II) ☐ 2. Concentrated Aquatic Animal Production Facility (complete items B, C, and section III)	Owner/or Operator Name: Riverview LLP dba Wulf Cattle Telephone: (320) 392-5802 Address: 26406 470th Ave Facsimile: (320) 392-5504 City: Morris State: MN Zip Code: 56267	☐ 1. Existing Facility ☐ 2. Proposed Facility

D. FACILITY INFORMATION

Name: Wulf Cattle Depot Telephone: (605) 823-4467
Address: PO Box 659, 400 Sale Barn Road Facsimile: (605) 823-4467
City: McLaughlin State: SD Zip Code: 57642
County: Corson Latitude: 45.816590 Longitude: -100.8069

If contract operation: Name of Integrator: _____
Address of Integrator: _____

II. CONCENTRATED ANIMAL FEEDING OPERATION CHARACTERISTICS

A. TYPE AND NUMBER OF ANIMALS

1. TYPE	2. ANIMALS: NO. IN OPEN CONFINEMENT	2. ANIMALS: NO. HOUSED UNDER ROOF
☐ Mature Dairy Cows		
☐ Dairy Heifers		
☐ Veal Calves		
☒ Cattle (not dairy or veal calves)	12400	0
☐ Swine (55 lbs. or over)		
☐ Swine (under 55 lbs.)		
☐ Horses		
☐ Sheep or Lambs		
☐ Turkeys		
☐ Chickens (Broilers)		
☐ Chickens (Layers)		
☐ Ducks		
☐ Other: Specify _____		
3. TOTAL ANIMALS	12,400	0

B. MANURE, LITTER, AND/OR WASTEWATER PRODUCTION AND USE

1. How much manure, litter, and wastewater is generated annually by the facility? 19,000 tons 10,688,702 gallons
2. If land applied how many acres of land under the control of the applicant are available for applying the CAFOs manure/litter/wastewater? 7,312.3 acres
3. How many tons of manure or litter, or gallons of waste-water produced by the CAFO will be transferred annually to other persons? 10,000 tons 0 gallons

C. ☒ TOPOGRAPHIC MAP

D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY

1. Type of Containment	Total Capacity (in gallons)
☐ Lagoon	
☒ Holding Pond	22,763,595
☐ Evaporation Pond	
☐ Other: Specify _____	

2. Report the total number of acres contributing drainage: _153.3_____ acres

3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)
☐ Anaerobic Lagoon		
☐ Storage Lagoon		
☐ Evaporation Pond		
☐ Aboveground Storage Tanks		
☐ Belowground Storage Tanks		
☐ Roofed Storage Shed		
☐ Concrete Pad		
☐ Impervious Soil Pad		
☒ Other: Specify Holding Pond	365	22,763,595

E. NUTRIENT MANAGEMENT PLAN

Note: Effective February 27, 2009, a permit application is not complete until a nutrient management plan is submitted to the Permitting Authority.

1. Please indicate whether a nutrient management plan has been included with this permit application. ☐ Yes ☐ No

2. If no, please explain:

3. Is a nutrient management plan being implemented for the facility? ☐ Yes ☐ No

4. The date of the last review or revision of the nutrient management plan. Date: 10/02/20

5. If not land applying, describe alternative use(s) of manure, litter, and/or wastewater:

F. LAND APPLICATION BEST MANAGEMENT PRACTICES

Please check any of the following best management practices that are being implemented at the facility to control runoff and protect water quality:

☐ Buffers ☒ Setbacks ☐ Conservation tillage ☐ Constructed wetlands ☐ Infiltration field ☐ Grass filter ☐ Terrace

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III. CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY CHARACTERISTICS

A. For each outfall give the maximum daily flow, maximum 30-day flow, and the long-term average flow.

B. Indicate the total number of ponds, raceways, and similar structures in your facility.

1. Outfall No.	2. Flow (*gallons per day*)			B. 1. Ponds	B. 2. Raceways	B. 3. Other
	a. Maximum. Daily	b. Maximum 30 Day	c. Long Term Average			
[redacted]						

C. Provide the name of the receiving water and the source of water used by your facility.

1. Receiving Water	2. Water Source

D. List the species of fish or aquatic animals held and fed at your facility. For each species, give the total weight produced by your facility per year in pounds of harvestable weight, and also give the maximum weight present at any one time.

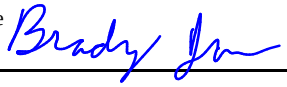
1. Cold Water Species			2. Warm Water Species		
a. Species	b. Harvestable Weight *(pounds)*		a. Species	b. Harvestable Weight *(pounds)*	
	(1) Total Yearly	(2) Maximum		(1) Total Yearly	(2) Maximum

E. Report the total pounds of food during the calendar month of maximum feeding.

1. Month	2. Pounds of Food

IV. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. Name and Official Title (*print or type*)	B. Telephone (320) 392-6764
Brady Janzen	
C. Signature 	D. Date Signed 10/2/2020

Please print or type in the unshaded areas only. Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY
GENERAL INFORMATION
Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F			D
1	2 — 13	14	15

LABEL ITEMS	
I. EPA I.D. NUMBER	PLEASE PLACE LABEL IN THIS SPACE
III. FACILITY NAME	
V. FACILITY MAILING ADDRESS	
VI. FACILITY LOCATION	

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)	16	X 17	18	B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)	19	X 20	21
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	22	X 23	24	D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)	25	X 26	27
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	28	X 29	30	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	31	X 32	33
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	34	X 35	36	H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	37	X 38	39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	40	X 41	42	J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)	43	X 44	45

III. NAME OF FACILITY

C	SKIP	
1		Wulf Cattle Depot
15	16 – 29	30 — 69

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
C 2 Sutherland, Lucas, Manager	(605) 823-4467
15 — 16 — 45	46 — 48 — 49 — 51 — 52- — 55

V. FACILTY MAILING ADDRESS

A. STREET OR P.O. BOX
C 3 PO Box 659, 400 Sale Barn Road
15 — 16 — 45

B. CITY OR TOWN	C. STATE	D. ZIP CODE
C 4 McLaughlin	SD	57642
15 — 16 — 40	41 — 42	47 — 51

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER
C 5 PO Box 659, 400 Sale Barn Road
15 — 16 — 45

B. COUNTY NAME
Corson
46 — 70

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
C 6 McLaughlin	SD	57642	
15 — 16 — 40	41 — 42	47 — 51	52 — -54

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 *(specify)*	7 *(specify)*
C. THIRD	**D. FOURTH**
7 *(specify)*	7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME: 8 Lucas Sutherland

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☑ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other," specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P *(specify)*

D. PHONE *(area code & no.)*: A (605) 823-4467

E. STREET OR P.O. BOX: PO Box 659, 400 Sale Barn Road

F. CITY OR TOWN: B McLaughlin

G. STATE: SD

H. ZIP CODE: 57642

IX. INDIAN LAND

Is the facility located on Indian lands? ☑ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*
9 N SD-0034606	9 P
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
9 U	9 *(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
9 R	9 *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

This is a 12,400 head beef feedlot. The runoff from the feedlot is contained within four lined holding ponds. Nutrients generated from the site both liquid and solids are land applied in accordance with the Nutrient Mangagement Plan.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
Brady Janzen, ~~Part Owner~~ Limited Liability Partner	Brady Janzen	10/31/2020

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (8-90)

Section B: Initial Nutrient Management Plan

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

INITIAL NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63A
4/08

1. **Operator:** Wulf Cattle Depot 2. **County:** Corson 3. **Prepared By:** Nathan Pesta 4. **Date:** 27-Dec-11

Total Nitrogen And Phosphorus Produced From Livestock Operation(s)

5.	6.	7.	8.	9.		10.		11.	12.	13.		14.	15.		16.	
Animal Type:	No. of animals	Avg. weight (lbs.)	Days of Confine-ment	N	P_2O_5	N retained		Total N available for application (lbs.)	Time of applic-ation	N Retained		Total N retained in field (lbs.)	3-Yr. Mineralization Rate		N	P_2O_5
				Total Manure as Excreted (lbs.)		Handling/Storage	%			Application Method	%		Manure Handling	%	Available for the crop (lbs.)	
Beef	12,400	650	365	911,989	735,475	Solid - open lot	52	474,234	Spring/Fall/Summer	Broadcast (no incorp.)	80	379,387	Solid without bedding	61	231,426	735,475
Other Animals																

Total Manure as Excreted: 475,540 **OR** 173,572,100 lbs/year **Total lbs. of N and P2O5 available for the crop:** 231,426 735,475

Section C: SD-CPA-63, Nutrient Management Planning Tool

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63B
4/08

Part 1: Field Information

Operator: Wulf Cattle Depot

County: Corson

Actual or Yield
Yields indexed by soil productivity
County Average Yields (SD Agriculture)

Date: 11/14/12

Part 2: Estimated Nutrient Requirement

Operator: Wulf Cattle Depot

County: Corson

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	18. Date added to Plan	19. Beginning acres in field	20. County	21. Soil map unit symbol	22. Field Location: (1/4 Section, Township, Range)					23. Predicted soil loss - RUSLE2 (T/ac/yr)	24. Control of Land	25. 60' Vegetated Buffer	26. Excluded acres	27. Irrigated	28. No-Till	Current Soil Test Levels: N lb/ac 0-2'	N lb/ac 2-4'	Phosphorus (ppm) 0-6"	Phosphorus (ppm) P Test	K (ppm)	Soil Sample Date	29. Crops in Rotation and Average Yield: Additional 10% is added to yields for nutrient management purposes. Previous Year: Crop	Previous Year: County Yield	Previous Year: Actual Yield	Year 1: Crop	Year 1: County Yield	Year 1: Yield Goal	Year 2: Crop	Year 2: County Yield	Year 2: Yield Goal	Year 3: Crop	Year 3: County Yield	Year 3: Yield Goal	Year 4: Crop	Year 4: County Yield	Year 4: Yield Goal	Year 5: Crop	Year 5: County Yield
1	T1631 F1	1	3/10/10	67.1	Corson	DaA	NW 1/4	Sec 3	T 21N	R 26E		0.6	Owned	X	3.1		X	67		26	Olsen	492	09/19/11	Wheat, Sp (bu)		55	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		55	Oats (bu)	65
2	T1631 F2	2	3/10/10	89.0	Corson	RnB	NW 1/4	Sec 3	T 21N	R 26E		1.1	Owned	X			X	67		26	Olsen	492	09/19/11	Wheat, Sp (bu)		55	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		55	Oats (bu)	65
3	T11198 F8	3	3/10/10	103.0	Corson	ShB	SW 1/4	Sec 4	T 21N	R 27E		0.1	Owned			X	X	38		10	Olsen	318	02/15/11	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Corn (bu)	63
4	T1637 F2	4	3/10/10	228.0	Corson	RcC	E 1/2	Sec 5	T 21	R 26		0.1	Owned	X	20.0		X	25		9	Olsen	288	01/23/12	Corn (bu)		120	Oats (bu)		61	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)	65
5	T11199 F3	5	3/10/10	61.0	Corson	An	SW 1/4	Sec 5	T 21N	R 27E		0.1	Owned	X	5.5		X	29		9	Olsen	348	02/15/10	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
6	T11199 F6	6	3/10/10	125.0	Corson	RaB	SE 1/4	Sec 5	T 21N	R 27E		0.1	Leased	X	5.1		X	29		9	Olsen	373	02/15/10	Wheat, Sp (bu)		55	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)		29	Corn (bu)	63
7	T1764 F1	7	3/10/10	129.4	Corson	ShB	NW 1/4	Sec 6	T 21N	R 27E		0.1	Leased	X	6.5		X	17		14	Olsen	350	01/17/12	Corn (bu)		120	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)	1492
8	T11329 F1	8	3/10/10	72.4	Corson	ShB	SE 1/4	Sec 6	T 21N	R 27E		0.1	Owned	X	12.2		X	17		13	Olsen	357	07/15/11	Barley (bu)		68	Corn (bu)		75	Oats (bu)		61	Wheat, Sp (bu)		29	Barley (bu)		34	Corn (bu)	63
9	T11329 F2	9	3/10/10	295.6	Corson	ShB	W 1/2	Sec 7	T 21N	R 27E		0.1	Owned	X	16.2		X	28		17	Olsen	289	09/08/11	Wheat, Sp (bu)		55	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)	63
10	T1898 F1	10	3/10/10	139.8	Corson	ShB	NW 1/4	Sec 8	T 21N	R 27E		0.5	Leased	X			X	60		19	Olsen	342	02/15/10	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
11	T1426 F1	11	3/10/10	147.7	Corson	An	NE 1/4	Sec 8	T 21N	R 27E		0.1	Owned	X	2.0		X	60		19	Olsen	342	02/15/10	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
12	T1930 F1	12A	6/5/13	80.9	Corson	ShB	NE 1/4	Sec 9	T 21N	R 27E		1.5	Owned	X			X	65		11	Olsen	248	09/08/11	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
13	T1929 F1	13	3/10/10	89.0	Corson	ShB	SW 1/4	Sec 9	T 21N	R 27E		0.1	Leased	X	2.0		X	65		11	Olsen	248	09/08/11	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
14	T11460 F1	14	3/10/10	150.0	Corson	RsB	NE 1/4	Sec 9	T 22	R 27		0.2	Owned	X	18.0		X	36		8	Olsen	381	12/12/11	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
15	T1894 F3	15	3/10/10	133.0	Corson	RaA	SE 1/4	Sec 9	T 22	R 27		0.1	Leased	X			X	36		8	Olsen	381	12/12/11	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
16	T1900 F1	16	3/10/10	315.0	Corson	RsB	E 1/2	Sec 10	T 22N	R 27E		0.2	Leased	X			X	68		42	Olsen	600	02/24/10	Corn (bu)		120	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
17	T1763 F1	17	3/10/10	155.5	Corson	RaB	SE 1/4	Sec 13	T 21N	R 26E		1.0	Leased	X	6.5		X	60		20	Olsen	376	02/15/10	Corn (bu)		120	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
18	T1892 F2	18	3/10/10	176.7	Corson	DaA	N 1/2	Sec 15	T 22N	R 27E		1.0	Leased	X			X	30		14	Olsen	294	02/24/10	Corn (bu)		120	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		147	Corn (bu)	63
19	T1892 F3	19	3/10/10	143.0	Corson	SgA	N 1/2	Sec 15	T 22N	R 27E		1.0	Leased	X			X	30		14	Olsen	294	02/24/10	Corn (bu)		120	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
20	T1901 F1	20	3/10/10	292.0	Corson	RsB	E 1/2	Sec 16	T 22N	R 27E		0.5	Leased	X	3.5		X	44		22	Olsen	389	02/24/10	Corn (bu)		120	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
21	T10091 F4	21	3/10/10	131.5	Corson	StA	N 1/2	Sec 19	T 22N	R 27E		0.1	Leased	X			X	28		9	Olsen	296	02/15/10	Corn (bu)		120	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
22	T1767 F2	22	3/10/10	120.0	Corson	StA	E 1/2	Sec 30	T 22N	R 27E		0.1	Leased	X	10.7		X	28		19	Olsen	347	07/21/11	Oats (bu)		80	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
23	T1767 F5	23	3/10/10	105.1	Corson	Gr	N 1/2	Sec 31	T 22N	R 27E		1.0	Leased	X	15.8		X	24		24	Olsen	332	07/21/11	Oats (bu)		80	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
24	T1767 F6	24	3/10/10	61.0	Corson	ShA	SE 1/4	Sec 31	T 22N	R 27E		0.1	Leased	X	5.6		X	85		38	Olsen	332	02/19/10	Oats (bu)		80	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
25	T1638 F1A	25	3/10/10	156.4	Corson	RsB	S 1/2	Sec 34	T 22N	R 26E		0.3	Owned	X	7.0		X	28		7	Olsen	395	01/19/12	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
26	T1638 F1B	26	3/10/10	154.0	Corson	DaA	S 1/2	Sec 34	T 22N	R 26E		0.1	Owned	X	4.0		X	28		7	Olsen	395	01/19/12	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
27	T1770 F1	27	3/10/10	155.5	Corson	ShA	NW 1/4	Sec 34	T 22N	R 27E		0.1	Leased	X	7.4		X	25		8	Olsen	274	07/25/11	Oats (bu)		80	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
28	T1766 F1	28	3/10/10	99.2	Corson	An	NE 1/4	Sec 34	T 22N	R 27E		0.1	Leased	X	0.0		X	51		32	Olsen	572	09/08/11	Oats (bu)		80	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)		29	Oats (bu)		61	Sunflowers (lbs)	1492
29		29	12/29/11	229.4	Corson	VhB	N 1/2	Sec 4	T 20N	R 25E		0.3	Leased	X			X	20		12	Olsen	280	12/14/11	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
30		30	12/29/11	155.7	Corson	RaC	NW 1/4	Sec 4	T 21N	R 26E		0.1	Owned	X	5.7		X	32		7	Olsen	333	09/19/11	Wheat, Sp. (bu)		55	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
31		31	12/29/11	68.4	Corson	RnB	N 1/2	Sec 4	T 21N	R 26E		0.0	Owned	X	4.3		X	32		7	Olsen	333	09/19/11	Wheat, Sp. (bu)		55	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
32		32	12/29/11	70.4	Corson	RpC	NE 1/4	Sec 4	T 21N	R 26E		0.4	Owned	X	5.3		X	32		7	Olsen	333	09/19/11	Wheat, Sp. (bu)		55	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
33		33	12/29/11	183.0	Corson	RaB	N 1/2	Sec 7	T 21N	R 26E		0.1	Leased	X	24.7		X	85		10	Olsen	339	09/19/11	Wheat, Sp. (bu)		55	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
34		34	12/29/11	38.0	Corson	RcB	NE 1/4	Sec 7	T 21N	R 26E		0.2	Leased	X			X	85		10	Olsen	339	09/19/11	Wheat, Sp. (bu)		55	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
35		35	12/29/11	317.7	Corson	RnB	W 1/2	Sec 10	T 21N	R 25E		0.3	Leased	X			X	63		8	Olsen	424	09/19/11	Wheat, Sp. (bu)		55	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
36		36	12/29/11	159.1	Corson	VeB	SE 1/4	Sec 10	T 21N	R 25E		0.2	Leased	X	6.1		X	14		23	Olsen	576	01/19/12	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
37		37	12/29/11	157.0	Corson	Gr	S 1/2	Sec 11	T 21N	R 25E		0.1	Leased	X			X	56		13	Olsen	516	09/19/11	Wheat, Sp. (bu)		55	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
38		38	12/29/11	67.0	Corson	RnB	W 1/2	Sec 12	T 21N	R 25E		0.1	Leased	X			X	12		8	Olsen	334	10/21/10	Wheat, Sp. (bu)		55	Wheat, Sp. (bu)		29	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
39		39	12/29/11	254.2	Corson	RnB	E 1/2	Sec 14	T 21N	R 25E		0.1	Leased	X	3.1		X	16		13	Olsen	376	12/14/11	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
40		40	12/29/11	156.5	Corson	SgB	NE 1/4	Sec 23	T 21N	R 25E		0.1	Leased	X			X	16		13	Olsen	376	12/14/11	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
41		41	12/29/11	85.1	Corson	An	SE 1/4	Sec 24	T 21N	R 26E		0.0	Leased	X			X	39		17	Olsen	257	09/08/11	Wheat, Sp. (bu)		55	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
42		42	12/29/11	73.7	Corson	ShB	SE 1/4	Sec 24	T 21N	R 26E		0.1	Leased	X			X	39		17	Olsen	257	09/08/11	Wheat, Sp. (bu)		55	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
43		43	12/29/11	316.3	Corson	RnB	W 1/2	Sec 26	T 21N	R 25E		0.2	Leased	X	6.8		X	18		12	Olsen	275	12/14/11	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
44		44	12/29/11	308.7	Corson	VeB	S 1/2	Sec 32	T 21N	R 25E		0.2	Leased	X	0.8		X	20		12	Olsen	280	12/14/11	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
45		45	12/29/11	160.0	Corson	RcB	NE 1/4	Sec 32	T 22N	R 26E		0.5	Owned	X	17.4		X	14		2	Olsen	214	12/14/11	Alfalfa (ton) <1 plant/sq.ft.		2	Alfalfa (ton) >1 plant/sq.ft		2	Wheat, Sp. (bu)		29	Corn (bu)		75	Alfalfa (ton) >1 plant/sq.ft.		2	Alfalfa (ton) >1 plant/sq.ft	2
46		46	12/29/11	317.1	Corson	RaB	W 1/2	Sec 35	T 21N	R 25E		0.2	Leased	X			X	18		12	Olsen	275	12/14/11	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
47		12B	6/5/13	44.7	Corson	ShB	NE 1/4	Sec 9	T 21N	R 27E		1.9	Leased	X			X	65		11	Olsen	248	09/08/11	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
48		47A	6/5/13	44.5	Corson	ShA	NW 1/4	Sec 9	T 21N	R 27E		1.9	Owned	X			X	30		10	Olsen	334	04/02/13	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
49		47B	6/5/13	75.9	Corson	ShB	NW 1/4	Sec 9	T 21N	R 27E		1.3	Owned	X			X	30		10	Olsen	334	04/02/13	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
50		48	6/5/13	293.7	Corson	VhB	E 1/2	Sec 16	T 21N	R 27E		0.4	Owned	X	16.3		X	12		6	Olsen	358	04/02/13	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28

Total: 7,551.9

Comments:

Previous Year = 2012
Year 1 = 2013

Tota
Total lbs of N and P2
Total lbs of N and P
Adequate a
However, P2O5 is in excess of removal. At this rate, it will take approximately 8 years

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 3: Planned Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson

Yields indexed by soil productivity
County Average Yields (SD Agricultu

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	Yield Goal	30. Initial Nutrient Mgt. Plan - N based fields (acres)	31. Nutrient Recommendation - *SDSU Extension Service EC-750* N	P_2O_5	K_2O	32. Manure application based on:	34. Manure Application and Incorporation: Type of Manure (Year of Application)	Type of Application (Time of incorporation)	Manure Test: Total N	Inorganic N	Total P2O5	Total K2O	Date Tested	35. Available N (First crop year) lbs/Ton or lbs/1,000 gal	36. Maximum Manure Application Rate: To meet N needs	Quantity of Manure per Field	37. Acres of Actual Nutrient Application
1	T1631 F1	1	61	64.0	42	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	320 Tons	64.0
2	T1631 F2	2	61	89.0	42	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	445 Tons	89.0
3	T11198 F8	3	147	103.0	168	38	0	Nitrogen need	Livestock (1st Year)	Liquid Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	96,700 Gal/ac	9,960,100 Gal	78.0
4	T1637 F2	4	61	208.0	84	17	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	2,288 Tons	208.0
5	T11199 F3	5	29	55.5	74	70	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	500 Tons	55.5
6	T11199 F6	6	75	119.9	91	23	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,319 Tons	119.9
7	T1764 F1	7	1,822	122.9	104	11	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	13 Tons/ac	1,598 Tons	122.9
8	T11329 F1	8	75	60.2	103	10	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	13 Tons/ac	783 Tons	60.2
9	T11329 F2	9	75	279.4	92	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,073 Tons	279.4
10	T1898 F1	10	29	139.8	42	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	699 Tons	139.8
11	T1426 F1	11	29	145.7	42	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	729 Tons	145.7
12	T1930 F1	12A	29	80.9	38	50	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	405 Tons	80.9
13	T1929 F1	13	29	87.0	38	50	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	435 Tons	87.0
14	T11460 F1	14	29	132.0	66	75	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	8 Tons/ac	1,056 Tons	132.0
15	T1894 F3	15	29	133.0	66	75	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	8 Tons/ac	1,064 Tons	133.0
16	T1900 F1	16	75	315.0	52	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	7 Tons/ac	2,205 Tons	315.0
17	T1763 F1	17	29	149.0	42	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	745 Tons	149.0
18	T1892 F2	18	75	176.7	90	6	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,944 Tons	176.7
19	T1892 F3	19	75	143.0	90	6	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,573 Tons	143.0
20	T1901 F1	20	75	288.5	76	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,597 Tons	288.5
21	T10091 F4	21	29	131.5	74	70	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,184 Tons	131.5
22	T1767 F2	22	34	109.3	53	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	7 Tons/ac	765 Tons	109.3
23	T1767 F5	23	34	89.3	57	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	7 Tons/ac	625 Tons	89.3
24	T1767 F6	24	34	57.4	0	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	57.4
25	T1638 F1A	25	61	149.4	81	22	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,494 Tons	149.4
26	T1638 F1B	26	61	150.0	81	22	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,500 Tons	150.0
27	T1770 F1	27	34	148.1	56	13	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	7 Tons/ac	1,037 Tons	148.1
28	T1766 F1	28	1,822	99.2	70	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	893 Tons	99.2
29		29	29	229.4	82	40	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	2,294 Tons	229.4
30		30	61	150.0	77	22	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,500 Tons	150.0
31		31	61	64.1	77	22	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	641 Tons	64.1
32		32	61	65.1	77	22	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	651 Tons	65.1
33		33	1,822	158.3	18	60	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	2 Tons/ac	317 Tons	158.3
34		34	1,822	38.0	18	60	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	2 Tons/ac	76 Tons	38.0
35		35	1,822	317.7	40	75	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	1,589 Tons	317.7
36		36	61	153.0	95	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	153.0
37		37	1,822	157.0	46	30	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	157.0
38		38	29	67.0	90	75	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	67.0
39		39	1,822	251.1	105	13	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	251.1
40		40	1,822	156.5	105	13	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	156.5
41		41	75	85.1	81	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	85.1
42		42	75	73.7	81	0	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	73.7
43		43	29	309.5	84	40	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	309.5
44		44	29	307.9	82	40	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	307.9
45		45	2	142.6	96	32	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	142.6
46		46	29	317.1	84	40	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	317.1
47		12B	29	44.7	38	50	0	Nitrogen need	Livestock (1st Year)	Liquid Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	16,700 Gal/ac	746,490 Gal	44.7
48		47A	29	44.5	72	60	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	44.5
49		47B	29	75.9	72	60	0	Nitrogen need	Livestock (1st Year)	Liquid Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	31,600 Gal/ac	2,398,440 Gal	75.9
50		48	29	277.4	90	95	0	Nitrogen need	Livestock (1st Year)	Solid Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	277.4

	Acres: 7,312.3	N	P_2O_5
	O5 available for crops:	231,426	735,475
	2O5 required by fields:	361,550	144,261

cres are available based on Nitrogen analysis
s) to build all listed fields up to 50 ppm P (Olsen).

Comments:

Part 4: Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson **Date:** 11/14/12

Line #	38. Manure Application: Actual Manure Rate Applied		Date Manure Applied	Time Period When Manure Applied	39. Nutrients Applied: Commercial lbs/acre N	P_2O_5	K_2O	Manure lbs/acre N	P_2O_5	K_2O	Total lbs/acre N	P_2O_5	K_2O	40. Estimated years to reapplication based on P_2O_5 rate
1	5	Tons/ac	October	Fall	20			20	42	65	40	42	65	N/A
2	5	Tons/ac	October	Fall	20			20	42	65	40	42	65	N/A
3	96,700	Gal/ac	July	Summer	58			110	48	580	168	48	580	N/A
4	11	Tons/ac	October	Fall	40			45	92	143	85	92	143	N/A
5	9	Tons/ac	October	Fall	37			37	76	117	74	76	117	N/A
6	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
7	13	Tons/ac	October	Fall	50			53	109	169	103	109	169	N/A
8	13	Tons/ac	October	Fall	50			53	109	169	103	109	169	N/A
9	11	Tons/ac	October	Fall	46			45	92	143	91	92	143	N/A
10	5	Tons/ac	October	Fall	20			20	42	65	40	42	65	N/A
11	5	Tons/ac	October	Fall	20			20	42	65	40	42	65	N/A
12	5	Tons/ac	October	Fall	18			20	42	65	38	42	65	N/A
13	5	Tons/ac	October	Fall	18			20	42	65	38	42	65	N/A
14	8	Tons/ac	October	Fall	33			33	67	104	66	67	104	N/A
15	8	Tons/ac	October	Fall	33			33	67	104	66	67	104	N/A
16	7	Tons/ac	October	Fall	25			28	59	91	53	59	91	N/A
17	5	Tons/ac	October	Fall	20			20	42	65	40	42	65	N/A
18	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
19	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
20	9	Tons/ac	October	Fall	38			37	76	117	75	76	117	N/A
21	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
22	7	Tons/ac	October	Fall	25			28	59	91	53	59	91	N/A
23	7	Tons/ac	October	Fall	28			28	59	91	56	59	91	N/A
24		Tons/ac	October	Fall	0						0			N/A
25	10	Tons/ac	October	Fall	40			41	84	130	81	84	130	N/A
26	10	Tons/ac	October	Fall	40			41	84	130	81	84	130	N/A
27	7	Tons/ac	October	Fall	27			28	59	91	55	59	91	N/A
28	9	Tons/ac	October	Fall	35			37	76	117	72	76	117	N/A
29	10	Tons/ac	October	Fall	41			41	84	130	82	84	130	N/A
30	10	Tons/ac	October	Fall	38			41	84	130	79	84	130	N/A
31	10	Tons/ac	October	Fall	38			41	84	130	79	84	130	N/A
32	10	Tons/ac	October	Fall	38			41	84	130	79	84	130	N/A
33	2	Tons/ac	October	Fall	9	43		8	17	26	17	60	26	N/A
34	2	Tons/ac	October	Fall	9	43		8	17	26	17	60	26	N/A
35	5	Tons/ac	October	Fall	20	42		20	42	65	40	84	65	N/A
36		Tons/ac			95	0					95	0		N/A
37		Tons/ac			46	30					46	30		N/A
38		Tons/ac			90	75					90	75		N/A
39		Tons/ac			105	13					105	13		N/A
40		Tons/ac			105	13					105	13		N/A
41		Tons/ac			81	0					81	0		N/A
42		Tons/ac			81	0					81	0		N/A
43		Tons/ac			84	40					84	40		N/A
44		Tons/ac			82	40					82	40		N/A
45		Tons/ac			96	32					96	32		N/A
46		Tons/ac			84	40					84	40		N/A
47	16,700	Gal/ac	July	Summer	19	0		19	8	100	38	8	100	N/A
48		Tons/ac			72	0					72	0		N/A
49	31,600	Gal/ac	July	Summer	36	0		36	16	190	72	16	190	N/A
50		Tons/ac			90	0					90	0		N/A

Comments:
Manure Application Estimate for 2013 Growing Season

Plan Year: 2013

Part 5: Nutrient Balance

41. Nutrient Balance						
Field #	Crop Yield, lb, bu, ton	Estimated Crop N Removal lb/ac	Estimated Crop P_2O_5 removal lb/ac	Nitrogen Balance lb/ac	P_2O_5 Balance ppm	Legume Credit (Table 2 of EC750)
1	61	79.3	15.3	28	29	
2	61	79.3	15.3	28	29	
3	147	176.4	31.9	30	11	
4	61	79.3	15.3	31	15	
5	29	72.5	16.2	31	14	
6	75	90.0	26.3	29	15	
7	1822	91.1	20.0	32	21	
8	75	90.0	26.3	29	20	
9	75	90.0	26.3	32	23	
10	29	72.5	16.2	29	22	
11	29	72.5	16.2	29	22	
12A	29	72.5	16.2	30	14	
13	29	72.5	16.2	30	14	
14	29	72.5	16.2	29	13	
15	29	72.5	16.2	29	13	
16	75	90.0	26.3	31	45	
17	29	72.5	16.2	29	23	
18	75	90.0	26.3	30	20	
19	75	90.0	26.3	30	21	
20	75	90.0	26.3	30	27	
21	29	72.5	16.2	30	18	
22	34	51.0	13.9	30	20	
23	34	51.0	13.9	30	23	
24	34	51.0	13.9	34	37	
25	61	79.3	15.3	30	7	
26	61	79.3	15.3	30	7	
27	34	51.0	8.5	30	8	
28	1822	91.1	20.0	30	31	
29	29	72.5	16.2	30	13	
30	61	79.3	15.3	30	7	
31	61	79.3	15.3	30	7	
32	61	79.3	15.3	30	7	
33	29	72.5	16.2	31	12	
34	29	72.5	16.2	31	12	
35	29	72.5	16.2	31	11	
36	61	79.3	15.3	30	22	
37	29	72.5	16.2	30	14	
38	29	72.5	16.2	30	11	
39	1822	91.1	20.0	30	13	
40	1822	91.1	20.0	30	13	
41	75	90.0	26.3	30	16	
42	75	90.0	26.3	30	16	
43	29	72.5	16.2	30	13	
44	29	72.5	16.2	30	13	
45	2	110.0	24.0	14	2	
46	29	72.5	16.2	30	13	
12B	29	72.5	16.2	31	11	
47A	29	72.5	16.2	30	9	
47B	29	72.5	16.2	30	10	
48	29	72.5	16.2	30	5	

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63B
4/08

Part 1: Field Information

Operator: Wulf Cattle Depot **County:** Corson **Date:** 12/27/11

Line #	17 Field ID (Include maps to illustrate location) Name or Tract	Field #	18. Date added to Plan	19 Beginning acres in field	20 County	21. Soil map unit symbol	22. Field Location: (1/4 Section, Township, Range)				23 Predicted soil loss - RUSLE2 (T/ac/yr)	24 Control of Land	25 100' Vegetated Buffer	25 Excluded acres	26. Irrigated	27 No-Till	28 Current Soil Test Levels: N lb/ac 0-2'	N lb/ac 2-4'	Phosphorus (ppm) 0-6"	Phosphorus (ppm) P Test	K (ppm)	Soil Sample Date
1	T1631 F1	1	3/10/10	67.1	Corson	DaA	NW 1/4	Sec	3	T 21N	R 26E	0.6	Owned	X	3.1		X	28		29	Olsen	492	10/01/13
2	T1631 F2	2	3/10/10	89.0	Corson	RnB	NW 1/4	Sec	3	T 21N	R 26E	1.1	Owned	X			X	28		29	Olsen	492	10/01/13
3	T11198 F8	3	3/10/10	103.0	Corson	ShB	SW 1/4	Sec	4	T 21N	R 27E	0.1	Owned			X	X	30		11	Olsen	318	10/01/13
4	T1637 F2	4	3/10/10	228.0	Corson	ReC	E 1/2	Sec	5	T 21	R 26	0.1	Owned	X	20.0		X	31		15	Olsen	288	10/01/13
5	T11199 F3	5	3/10/10	61.0	Corson	An	SW 1/4	Sec	5	T 21N	R 27E	0.1	Owned	X	5.5		X	31		14	Olsen	348	10/01/13
6	T11199 F6	6	3/10/10	125.0	Corson	RaB	SE 1/4	Sec	5	T 21N	R 27E	0.1	Leased	X	5.1		X	29		15	Olsen	373	10/01/13
7	T1764 F1	7	3/10/10	129.4	Corson	ShB	NW 1/4	Sec	6	T 21N	R 27E	0.1	Leased	X	6.5		X	32		21	Olsen	350	10/01/13
8	T11329 F1	8	3/10/10	72.4	Corson	ShB	SE 1/4	Sec	6	T 21N	R 27E	0.1	Owned	X	12.2		X	29		20	Olsen	357	10/01/13
9	T11329 F2	9	3/10/10	295.6	Corson	ShB	W 1/2	Sec	7	T 21N	R 27E	0.1	Owned	X	16.2		X	32		23	Olsen	389	10/01/13
10	T1898 F1	10	3/10/10	139.8	Corson	ShB	NW 1/4	Sec	8	T 21N	R 27E	0.5	Leased	X			X	29		22	Olsen	342	10/01/13
11	T1426 F1	11	3/10/10	147.7	Corson	An	NE 1/4	Sec	8	T 21N	R 27E	0.1	Owned	X	2.0		X	29		22	Olsen	342	10/01/13
12	T1930 F1	12A	3/10/10	80.9	Corson	ShB	NE 1/4	Sec	9	T 21N	R 27E	0.1	Leased	X			X	30		14	Olsen	248	10/01/13
13	T1929 F1	13	3/10/10	89.0	Corson	ShB	SW 1/4	Sec	9	T 21N	R 27E	0.1	Leased	X	2.0		X	30		14	Olsen	248	10/01/13
14	T11460 F1	14	3/10/10	150.0	Corson	RsB	NE 1/4	Sec	9	T 22	R 27	0.2	Owned	X	18.0		X	29		13	Olsen	381	10/01/13
15	T1894 F3	15	3/10/10	133.0	Corson	RaA	SE 1/4	Sec	9	T 22	R 27	0.1	Leased	X			X	29		13	Olsen	381	10/01/13
16	T1900 F1	16	3/10/10	315.0	Corson	RsB	E 1/2	Sec	10	T 22N	R 27E	0.2	Leased	X			X	31		45	Olsen	600	10/01/13
17	T1763 F1	17	3/10/10	155.5	Corson	RaB	SE 1/4	Sec	13	T 21N	R 26E	1.0	Leased	X	6.5		X	29		23	Olsen	376	10/01/13
18	T1892 F2	18	3/10/10	176.7	Corson	DaA	N 1/2	Sec	15	T 22N	R 27E	1.0	Leased	X			X	30		20	Olsen	294	10/01/13
19	T1892 F3	19	3/10/10	143.0	Corson	SgA	N 1/2	Sec	15	T 22N	R 27E	1.0	Leased	X			X	30		21	Olsen	294	10/01/13
20	T1901 F1	20	3/10/10	292.0	Corson	RsB	E 1/2	Sec	16	T 22N	R 27E	0.5	Leased	X	3.5		X	30		27	Olsen	389	10/01/13
21	T10091 F4	21	3/10/10	131.5	Corson	StA	N 1/2	Sec	19	T 22N	R 27E	0.1	Leased	X			X	30		18	Olsen	296	10/01/13
22	T1767 F2	22	3/10/10	120.0	Corson	StA	E 1/2	Sec	30	T 22N	R 27E	0.1	Leased	X	10.7		X	30		20	Olsen	347	10/01/13
23	T1767 F5	23	3/10/10	105.1	Corson	Gr	N 1/2	Sec	31	T 22N	R 27E	1.0	Leased	X	15.8		X	30		23	Olsen	332	10/01/13
24	T1767 F6	24	3/10/10	61.0	Corson	ShA	SE 1/4	Sec	31	T 22N	R 27E	0.1	Leased	X	3.6		X	34		37	Olsen	332	10/01/13
25	T1638 F1A	25	3/10/10	156.4	Corson	RsB	S 1/2	Sec	34	T 22N	R 26E	0.3	Owned	X	7.0		X	30		7	Olsen	395	10/01/13
26	T1638 F1B	26	3/10/10	154.0	Corson	DaA	S 1/2	Sec	34	T 22N	R 26E	0.1	Owned	X	4.0		X	30		7	Olsen	395	10/01/13
27	T1770 F1	27	3/10/10	155.5	Corson	ShA	NW 1/4	Sec	34	T 22N	R 27E	0.1	Leased	X	7.4		X	30		8	Olsen	274	10/01/13
28	T1766 F1	28	3/10/10	99.2	Corson	An	NE 1/4	Sec	34	T 22N	R 27E	0.1	Leased	X	0.0		X	30		31	Olsen	572	10/01/13
29		29	12/29/11	229.4	Corson	VhB	N 1/2	Sec	4	T 20N	R 25E	0.3	Leased	X			X	30		13	Olsen	280	10/01/13
30		30	12/29/11	155.7	Corson	RaC	NW 1/4	Sec	4	T 21N	R 26E	0.1	Owned	X	5.7		X	30		7	Olsen	333	10/01/13
31		31	12/29/11	68.4	Corson	RnB	N 1/2	Sec	4	T 21N	R 26E	0.0	Owned	X	4.3		X	30		7	Olsen	333	10/01/13
32		32	12/29/11	70.4	Corson	RpC	NE 1/4	Sec	4	T 21N	R 26E	0.4	Owned	X	5.3		X	30		7	Olsen	333	10/01/13
33		33	12/29/11	183.0	Corson	RaB	N 1/2	Sec	7	T 21N	R 26E	0.1	Leased	X	24.7		X	31		12	Olsen	339	10/01/13
34		34	12/29/11	38.0	Corson	ReB	NE 1/4	Sec	7	T 21N	R 26E	0.2	Leased	X			X	31		12	Olsen	339	10/01/13
35		35	12/29/11	317.7	Corson	RnB	W 1/2	Sec	10	T 21N	R 25E	0.3	Leased	X			X	31		11	Olsen	424	10/01/13
36		36	12/29/11	159.1	Corson	VeB	SE 1/4	Sec	10	T 21N	R 25E	0.2	Leased	X	6.1		X	30		22	Olsen	576	10/01/13
37		37	12/29/11	157.0	Corson	Gr	S 1/2	Sec	11	T 21N	R 25E	0.1	Leased	X			X	30		14	Olsen	516	10/01/13
38		38	12/29/11	67.0	Corson	RnB	W 1/2	Sec	12	T 21N	R 25E	0.1	Leased	X			X	30		11	Olsen	334	10/01/13
39		39	12/29/11	254.2	Corson	RnB	E 1/2	Sec	14	T 21N	R 25E	0.1	Leased	X	3.1		X	30		13	Olsen	376	10/01/13
40		40	12/29/11	156.5	Corson	SgB	NE 1/4	Sec	23	T 21N	R 25E	0.1	Leased	X			X	30		13	Olsen	376	10/01/13
41		41	12/29/11	85.1	Corson	An	SE 1/4	Sec	24	T 21N	R 26E	0.0	Leased	X			X	30		16	Olsen	257	10/01/13
42		42	12/29/11	73.7	Corson	ShB	SE 1/4	Sec	24	T 21N	R 26E	0.1	Leased	X			X	30		16	Olsen	257	10/01/13
43		43	12/29/11	316.3	Corson	RnB	W 1/2	Sec	26	T 21N	R 25E	0.2	Leased	X	6.8		X	30		13	Olsen	275	10/01/13
44		44	12/29/11	308.7	Corson	VeB	S 1/2	Sec	32	T 21N	R 25E	0.2	Leased	X	0.8		X	30		13	Olsen	260	10/01/13
45		45	12/29/11	160.0	Corson	ReB	NE 1/4	Sec	32	T 22N	R 26E	0.5	Owned	X	17.4		X	14		2	Olsen	214	10/01/13
46		46	12/29/11	317.1	Corson	RaB	W 1/2	Sec	35	T 21N	R 25E	0.2	Leased	X			X	30		13	Olsen	275	10/01/13
47		12B	6/5/13	44.7	Corson	ShB	NE 1/4	Sec	9	T 21N	R 27E	1.9	Leased	X			X	31		11	Olsen	248	10/01/13
48		47A	6/5/13	44.5	Corson	ShA	NW 1/4	Sec	9	T 21N	R 27E	1.9	Leased	X			X	30		9	Olsen	334	10/01/13
49		47B	6/5/13	75.9	Corson	ShB	NW 1/4	Sec	9	T 21N	R 27E	1.3	Owned	X			X	30		10	Olsen	334	10/01/13
72		48	6/5/13	293.7	Corson	VhB	E 1/2	Sec	16	T 21N	R 27E	0.4	Owned	X	16.3		X	30		5	Olsen	358	10/01/13

Total: 7,551.9

Comments:
Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied

Part 2: Estimated Nutrient Requirement

Operator: Wulf Cattle Depot County: Corson

29
- (●) Actual or Yield Goal
- ( ) Yields indexed by soil productivity (Productivity Index)
- ( ) County Average Yields (SD Agricultural Statistics Service)

Crops in Rotation and Average Yield:
Additional 10% is added to yields for nutrient management purposes.

Line #	Previous Year Crop	Previous Year County Yield	Previous Year Actual Yield	Year 1 Crop	Year 1 County Yield	Year 1 Yield Goal	Year 2 Crop	Year 2 County Yield	Year 2 Yield Goal	Year 3 Crop	Year 3 County Yield	Year 3 Yield Goal	Year 4 Crop	Year 4 County Yield	Year 4 Yield Goal	Year 5 Crop	Year 5 County Yield
1	Oats (bu)		61	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		55	Oats (bu)	65
2	Oats (bu)		61	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		55	Oats (bu)	65
3	Wheat, Sp (bu)		57	Corn (bu)		147	Corn (bu)		147	Sunflowers (lbs)		2,915	Corn (bu)		147	Wheat, Sp (bu)	28
4	Oats (bu)		61	Barley, Malting (bu)		34	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)	65
5	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
6	Corn (bu)		75	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Corn (bu)		1,822	Wheat, Sp (bu)		29	Corn (bu)	63
7	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)		75	Sunflowers (lbs)	1492
8	Corn (bu)		75	Oats (bu)		61	Oats (bu)		61	Wheat, Sp (bu)		29	Barley (bu)		34	Corn (bu)	63
9	Corn (bu)		75	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)	63
10	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
11	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
12	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
13	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
14	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
15	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	28
16	Corn (bu)		75	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
17	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
18	Corn (bu)		75	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		147	Corn (bu)	63
19	Corn (bu)		75	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
20	Corn (bu)		75	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
21	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp (bu)	28
22	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
23	Barley, Malting (bu)		34	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
24	Wheat, Sp (bu)		29	Corn (bu)		75	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
25	Oats (bu)		61	Barley, Malting (bu)		34	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)	1,822		Oats (bu)	65
26	Oats (bu)		61	Barley, Malting (bu)		34	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)	1,822		Oats (bu)	65
27	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
28	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Wheat, Sp (bu)		29	Oats (bu)		61	Sunflowers (lbs)	1492
29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1,822		Wheat, Sp (bu)	28
30	Corn (bu)		61	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Oats (bu)	65
31	Corn (bu)		61	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Oats (bu)	65
32	Oats (bu)		61	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Oats (bu)	65
33	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1492
34	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1492
35	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1492
36	Oats (bu)		61	Barley, Malting (bu)		34	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)	1,822		Oats (bu)	65
37	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Sunflowers (lbs)	1,822		Sunflowers (lbs)	1492
38	Wheat, Sp (bu)		29	Barley, Malting (bu)		34	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Wheat, Sp (bu)	28
39	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
40	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
41	Corn (bu)		75	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)	63
42	Corn (bu)		75	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Corn (bu)	63
43	Wheat, Sp (bu)		29	Corn (bu)		75	Wheat, Sp (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)	1,822		Wheat, Sp (bu)	28
44	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1,822		Wheat, Sp (bu)	28
45	Alfalfa (ton) >1 plant/sq ft		2	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Corn (bu)		75	Alfalfa (ton) >1 plant/sq ft	2		Alfalfa (ton) >1 plant/sq ft	2
46	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Wheat, Sp (bu)		29	Sunflowers (lbs)	1,822		Wheat, Sp (bu)	28
47	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)	75		Wheat, Sp (bu)	28
48	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)	75		Wheat, Sp (bu)	28
49	Wheat, Sp (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)	29		Oats (bu)	65
72	Wheat, Sp (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp (bu)		29	Oats (bu)	65

Tota
Total lbs of N and P2
Total lbs of N and P
Adequate a

However, P2O5 is in excess of removal. At this rate, it will take approximately 8 year(

Previous Year = 2013
Year 1 = 2014

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 3: Planned Nutrient Application

Date: 12/27/11 **Operator:** Wulf Cattle Depot **County:** Corson

Part 4: Nutrient Application

Date: 12/27/11 **Operator:** Wulf Cattle Depot **County:** Corson **Date:** 12/27/11

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	Yield Goal	30. Initial Nutrient Mgt. Plan - N based fields (acres)	31. Nutrient Recommendation - *SDSU Extension Service EC-750* N	P_2O_5	K_2O	32. Manure application based on:	33. Manure Application and Incorporation: Type of Manure (Year of Application)	Type of Application (Time of incorporation)	34. Manure Test: Total N	Inorganic N	Total P2O5	Total K2O	Date Tested	35. Actual or Yield Goal / Nutrient Indexed by soil productivity (Productivity Index) / County Average Yields (SD Agricultural Statistics Service): lbs/Ton or lbs/1,000 gal	36. Maximum Manure Application Rate: To meet N needs	Quantity of Manure per Field	37. Acres of Actual Nutrient Application	38. Manure Application: Actual Manure Rate Applied		Date Manure Applied	Time Period When Manure Applied	39. Nutrients Applied: Commercial lbs/acre N	P_2O_5	K_2O	Manure lbs/acre N	P_2O_5	K_2O	Total lbs/acre N	P_2O_5	K_2O	40. Estimated years to reapplication based on P_2O_5 rate
1	T1631 F1	1	61	64.0	92	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	12 Tons/ac	768 Tons	64.0	12	Tons/ac	October	Fall	43		0	49	101	156	92	101	156	N/A
2	T1631 F2	2	61	89.0	92	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	12 Tons/ac	1,068 Tons	89.0	12	Tons/ac	October	Fall	43	0		49	101	156	92	101	156	N/A
3	T11198 F8	3	57	103.0	176	32	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	96,700 Gal/ac	9,960,100 Gal	78.0	96,700	Gal/ac	July	Summer	66	0		110	48	580	176	48	580	N/A
4	T1637 F2	4	61	208.0	50	1	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	1,248 Tons	208.0	6	Tons/ac	October	Fall	26	0		24	50	78	50	50	78	N/A
5	T11199 F3	5	29	55.5	89	6	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	611 Tons	55.5	11	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N/A
6	T11199 F6	6	75	119.9	92	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,319 Tons	119.9	11	Tons/ac	October	Fall	47	0		45	92	143	92	92	143	N/A
7	T1764 F1	7	1,822	122.9	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,352 Tons	122.9	11	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N/A
8	T11329 F1	8	75	60.2	80	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	602 Tons	60.2	10	Tons/ac	October	Fall	39	0		41	84	130	80	84	130	N/A
9	T11329 F2	9	75	279.4	88	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,073 Tons	279.4	11	Tons/ac	October	Fall	43	0		45	92	143	88	92	143	N/A
10	T1898 F1	10	29	139.8	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,538 Tons	139.8	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
11	T1426 F1	11	29	145.7	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,603 Tons	145.7	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
12	T1930 F1	12A	29	80.9	90	6	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	890 Tons	80.9	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
13	T1929 F1	13	29	87.0	90	6	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	957 Tons	87.0	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
14	T11460 F1	14	29	132.0	91	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,452 Tons	132.0	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
15	T1894 F3	15	29	133.0	91	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,463 Tons	133.0	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
16	T1900 F1	16	75	315.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	7 Tons/ac	2,205 Tons	315.0	7	Tons/ac			44	0		28	59	91	72	59	91	N/A
17	T1763 F1	17	29	149.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	149.0		Tons/ac			91	0					91	0		N/A
18	T1892 F2	18	75	176.7	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	176.7		Tons/ac			72	0					72	0		N/A
19	T1892 F3	19	75	143.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	143.0		Tons/ac			72	0					72	0		N/A
20	T1901 F1	20	75	288.5	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	288.5		Tons/ac			72	0					72	0		N/A
21	T10091 F4	21	29	131.5	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	131.5		Tons/ac			90	0					90	0		N/A
22	T1767 F2	22	34	109.3	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	109.3		Tons/ac			72	0					72	0		N/A
23	T1767 F5	23	34	89.3	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	89.3		Tons/ac			72	0					72	0		N/A
24	T1767 F6	24	34	57.4	68	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	57.4		Tons/ac			68	0					68	0		N/A
25	T1638 F1A	25	61	149.4	51	15	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	149.4		Tons/ac			51	15					51	15		N/A
26	T1638 F1B	26	61	150.0	51	15	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	150.0		Tons/ac			51	15					51	15		N/A
27	T1770 F1	27	34	148.1	72	75	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	148.1		Tons/ac			72	75					72	75		N/A
28	T1766 F1	28	1,822	99.2	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	99.2		Tons/ac			90	0					90	0		N/A
29		29	29	229.4	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	229.4		Tons/ac			72	30					72	30		N/A
30		30	61	150.0	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	150.0		Tons/ac			90	29					90	29		N/A
31		31	61	64.1	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	64.1		Tons/ac			90	29					90	29		N/A
32		32	61	65.1	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	65.1		Tons/ac			90	29					90	29		N/A
33		33	1,822	158.3	90	15	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	158.3		Tons/ac			90	15					90	15		N/A
34		34	1,822	38.0	90	15	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	38.0		Tons/ac			90	15					90	15		N/A
35		35	1,822	317.7	90	16	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	317.7		Tons/ac			90	16					90	16		N/A
36		36	61	153.0	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	918 Tons	153.0	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
37		37	1,822	157.0	91	11	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,727 Tons	157.0	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
38		38	29	67.0	51	8	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	402 Tons	67.0	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
39		39	1,822	251.1	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,260 Tons	251.1	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
40		40	1,822	156.5	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,409 Tons	156.5	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
41		41	75	85.1	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	936 Tons	85.1	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
42		42	75	73.7	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	811 Tons	73.7	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
43		43	29	309.5	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,786 Tons	309.5	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
44		44	29	307.9	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,771 Tons	307.9	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
45		45	2	142.6	64	135	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	8 Tons/ac	1,141 Tons	142.6	8	Tons/ac	October	Fall	31	0		33	67	104	64	67	104	N/A
46		46	29	317.1	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	3,171 Tons	317.1	10	Tons/ac	October	Fall	33	0		41	84	130	74	84	130	N/A
47		12B	29	44.7	89	16	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	16,700 Gal/ac	746,490 Gal	44.7	16,700	Gal/ac	July	Summer	70			19	8	100	89	8	100	N/A
48		47A	29	44.5	90	23	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	44.5		Tons/ac	October		90						90			N/A
49		47B	29	75.9	90	20	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	31,600 Gal/ac	2,398,440 Gal	75.9	31,600	Gal/ac	July	Summer	54			36	16	190	90	16	190	N/A
72		48	61	277.4	79	27	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	277.4		Tons/ac			79	0					79	0		N/A

l Acres:	7,312.3
O5 available for crops:	231,426
2O5 required by fields:	352,626

N	P_2O_5
231,426	735,475
352,626	144,614

cres are available based on Nitrogen analysis
s) to build all listed fields up to 50 ppm P (Olsen).

Comments:

Comments:
Manure application Estimate for 2014 Growing Season

Plan Year: 2014

Part 5: Nutrient Balance

41. Nutrient Balance						
Field #	Crop Yield, lb, bu, ton	Estimated Crop N Removal lb/ac	Estimated Crop P_2O_5 removal lb/ac	Nitrogen Balance lb/ac	*P_2O_5 Balance ppm	Legume Credit (Table 2 of EC750)
1	75	90.0	26.3	32	33	
2	75	90.0	26.3	32	31	
3	147	176.4	51.5	30	14	
4	34	51.0	13.9	29	16	
5	75	90.0	26.3	29	18	
6	1822	91.1	20.0	31	19	
7	1822	91.1	20.0	28	25	
8	61	79.3	15.3	31	23	
9	75	90.0	26.3	28	26	
10	75	90.0	26.3	30	25	
11	75	90.0	26.3	30	25	
12A	75	90.0	26.3	30	17	
13	75	90.0	26.3	30	17	
14	75	90.0	26.3	30	16	
15	75	90.0	26.3	30	17	
16	29	72.5	16.2	31	47	
17	75	90.0	26.3	30	22	
18	29	72.5	16.2	30	19	
19	29	72.5	16.2	30	20	
20	29	72.5	16.2	30	26	
21	75	90.0	26.3	30	17	
22	29	72.5	16.2	30	19	
23	29	72.5	16.2	30	22	
24	29	72.5	16.2	30	36	
25	34	51.0	13.9	30	7	
26	34	51.0	13.9	30	7	
27	29	72.5	16.2	30	10	
28	75	90.0	26.3	30	30	
29	29	72.5	16.2	30	13	
30	75	90.0	26.3	30	7	
31	75	90.0	26.3	30	7	
32	75	90.0	26.3	30	7	
33	1822	91.1	20.0	30	12	
34	1822	91.1	20.0	30	12	
35	1822	91.1	20.0	30	11	
36	34	51.0	13.9	30	23	
37	1822	91.1	20.0	30	18	
38	34	51.0	13.9	30	13	
39	29	72.5	16.2	30	16	
40	29	72.5	16.2	30	15	
41	75	90.0	26.3	30	19	
42	75	90.0	26.3	30	20	
43	29	72.5	16.2	30	16	
44	29	72.5	16.2	30	16	
45	29	72.5	16.2	32	5	25
46	29	72.5	16.2	32	15	
12B	75	90.0	26.3	30	10	
47A	75	90.0	26.3	30	8	
47B	75	90.0	26.3	30	10	
48	61	79.3	15.3	30	5	

*(Total Land Application of P_2O_5 in lb/acre - Total Crop Removal of P_2O_5 in lb/acre)/20 + Soil P_2O_5 in PPM

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63B
4/08

Part 1: Field Information

Operator: Wulf Cattle Depot **County:** Corson **Date:** 12/27/11

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	18. Date added to Plan	19. Beginning acres in field	20. County	21. Soil map unit symbol	22. Field Location: (1/4 Section, Township, Range)	23. Predicted soil loss - RUSLE2 (T/ac/yr)	24. Control of Land	25. 100' Vegetated Buffer	Excluded acres	26. Irrigated	27. No-Till	28. Current Soil Test Levels: N lb/ac 0-2'	N lb/ac 2-4'	Phosphorus (ppm) 0-6"	P Test	K (ppm)	Soil Sample Date
1	T1631 F1	1	3/10/10	67.1	Corson	DaA	NW 1/4 Sec. 3, T 21N, R 26E	0.6	Owned	X	3.1		X	32		33	Olsen	492	10/01/14
2	T1631 F2	2	3/10/10	89.0	Corson	RnB	NW 1/4 Sec. 3, T 21N, R 26E	1.1	Owned	X			X	32		31	Olsen	492	10/01/14
3	T11198 F8	3	3/10/10	103.0	Corson	ShB	SW 1/4 Sec. 4, T 21N, R 27E	0.1	Owned			X	X	30		14	Olsen	318	10/01/14
4	T1637 F2	4	3/10/10	228.0	Corson	RcC	E 1/2 Sec. 5, T 21, R 26	0.1	Owned	X	20.0		X	29		16	Olsen	288	10/01/14
5	T11199 F3	5	3/10/10	61.0	Corson	An	SW 1/4 Sec. 5, T 21N, R 27E	0.1	Owned	X	5.5		X	29		18	Olsen	348	10/01/14
6	T11199 F6	6	3/10/10	125.0	Corson	RaB	SE 1/4 Sec. 5, T 21N, R 27E	0.1	Leased	X	5.1		X	31		19	Olsen	373	10/01/14
7	T1764 F1	7	3/10/10	129.4	Corson	ShB	NW 1/4 Sec. 6, T 21N, R 27E	0.1	Leased	X	6.5		X	28		25	Olsen	350	10/01/14
8	T11329 F1	8	3/10/10	72.4	Corson	ShB	SE 1/4 Sec. 6, T 21N, R 27E	0.1	Owned	X	12.2		X	31		23	Olsen	357	10/01/14
9	T11329 F2	9	3/10/10	295.6	Corson	ShB	W 1/2 Sec. 7, T 21N, R 27E	0.1	Owned	X	16.2		X	28		26	Olsen	289	10/01/14
10	T1898 F1	10	3/10/10	139.8	Corson	ShB	NW 1/4 Sec. 8, T 21N, R 27E	0.5	Leased	X			X	30		25	Olsen	342	10/01/14
11	T1426 F1	11	3/10/10	147.7	Corson	An	NE 1/4 Sec. 8, T 21N, R 27E	0.1	Owned	X	2.0		X	30		25	Olsen	342	10/01/14
12	T1930 F1	12A	3/10/10	80.9	Corson	ShB	NE 1/4 Sec. 9, T 21N, R 27E	0.1	Owned	X			X	30		17	Olsen	248	10/01/14
13	T1929 F1	13	3/10/10	89.0	Corson	ShB	SW 1/4 Sec. 9, T 21N, R 27E	0.1	Leased	X	2.0		X	30		17	Olsen	248	10/01/14
14	T11460 F1	14	3/10/10	150.0	Corson	RsB	NE 1/4 Sec. 9, T 22, R 27	0.2	Owned	X	18.0		X	30		16	Olsen	381	10/01/14
15	T1894 F3	15	3/10/10	133.0	Corson	RaA	SE 1/4 Sec. 9, T 22, R 27	0.1	Leased	X			X	30		17	Olsen	381	10/01/14
16	T1900 F1	16	3/10/10	315.0	Corson	RsB	E 1/2 Sec. 10, T 22N, R 27E	0.2	Leased	X			X	31		47	Olsen	600	10/01/14
17	T1763 F1	17	3/10/10	155.5	Corson	RaB	SE 1/4 Sec. 13, T 21N, R 26E	1.0	Leased	X	6.5		X	30		22	Olsen	376	10/01/14
18	T1892 F2	18	3/10/10	176.7	Corson	DaA	N 1/2 Sec. 15, T 22N, R 27E	1.0	Leased	X			X	30		19	Olsen	294	10/01/14
19	T1892 F3	19	3/10/10	143.0	Corson	SgA	N 1/2 Sec. 15, T 22N, R 27E	1.0	Leased	X			X	30		20	Olsen	294	10/01/14
20	T1901 F1	20	3/10/10	292.0	Corson	RsB	E 1/2 Sec. 16, T 22N, R 27E	0.5	Leased	X	3.5		X	30		26	Olsen	389	10/01/14
21	T10091 F4	21	3/10/10	131.5	Corson	StA	N 1/2 Sec. 19, T 22N, R 27E	0.1	Leased	X			X	30		17	Olsen	296	10/01/14
22	T1767 F2	22	3/10/10	120.0	Corson	StA	E 1/2 Sec. 30, T 22N, R 27E	0.1	Leased	X	10.7		X	30		19	Olsen	347	10/01/14
23	T1767 F5	23	3/10/10	105.1	Corson	Gr	N 1/2 Sec. 31, T 22N, R 27E	1.0	Leased	X	15.8		X	30		22	Olsen	332	10/01/14
24	T1767 F6	24	3/10/10	61.0	Corson	ShA	SE 1/4 Sec. 31, T 22N, R 27E	0.1	Leased	X	3.6		X	30		36	Olsen	332	10/01/14
25	T1638 F1A	25	3/10/10	156.4	Corson	RsB	S 1/2 Sec. 34, T 22N, R 26E	0.3	Owned	X	7.0		X	30		7	Olsen	395	10/01/14
26	T1638 F1B	26	3/10/10	154.0	Corson	DaA	S 1/2 Sec. 34, T 22N, R 26E	0.1	Owned	X	4.0		X	30		7	Olsen	395	10/01/14
27	T1770 F1	27	3/10/10	155.5	Corson	ShA	NW 1/4 Sec. 34, T 22N, R 27E	0.1	Leased	X	7.4		X	30		10	Olsen	274	10/01/14
28	T1766 F1	28	3/10/10	99.2	Corson	An	NE 1/4 Sec. 34, T 22N, R 27E	0.1	Leased	X	0.0		X	30		30	Olsen	572	10/01/14
29		29	12/29/11	229.4	Corson	VhB	N 1/2 Sec. 4, T 20N, R 25E	0.3	Leased	X			X	30		13	Olsen	280	10/01/14
30		30	12/29/11	155.7	Corson	RaC	NW 1/4 Sec. 4, T 21N, R 26E	0.1	Owned	X	5.7		X	30		7	Olsen	333	10/01/14
31		31	12/29/11	68.4	Corson	RnB	N 1/2 Sec. 4, T 21N, R 26E	0.0	Owned	X	4.3		X	30		7	Olsen	333	10/01/14
32		32	12/29/11	70.4	Corson	RpC	NE 1/4 Sec. 4, T 21N, R 26E	0.4	Owned	X	5.3		X	30		7	Olsen	333	10/01/14
33		33	12/29/11	183.0	Corson	RaB	N 1/2 Sec. 7, T 21N, R 26E	0.1	Leased	X	24.7		X	30		12	Olsen	339	10/01/14
34		34	12/29/11	38.0	Corson	RcB	NE 1/4 Sec. 7, T 21N, R 26E	0.2	Leased	X			X	30		12	Olsen	339	10/01/14
35		35	12/29/11	317.7	Corson	RnB	W 1/2 Sec. 10, T 21N, R 25E	0.3	Leased	X			X	30		11	Olsen	424	10/01/14
36		36	12/29/11	159.1	Corson	VeB	SE 1/4 Sec. 10, T 21N, R 25E	0.2	Leased	X	6.1		X	30		23	Olsen	576	10/01/14
37		37	12/29/11	157.0	Corson	Gr	S 1/2 Sec. 11, T 21N, R 25E	0.1	Leased	X			X	30		18	Olsen	516	10/01/14
38		38	12/29/11	67.0	Corson	RnB	W 1/2 Sec. 12, T 21N, R 25E	0.1	Leased	X			X	30		13	Olsen	334	10/01/14
39		39	12/29/11	254.2	Corson	RnB	E 1/2 Sec. 14, T 21N, R 25E	0.1	Leased	X	3.1		X	30		16	Olsen	376	10/01/14
40		40	12/29/11	156.5	Corson	SgB	NE 1/4 Sec. 23, T 21N, R 25E	0.1	Leased	X			X	30		15	Olsen	376	10/01/14
41		41	12/29/11	85.1	Corson	An	SE 1/4 Sec. 24, T 21N, R 26E	0.0	Leased	X			X	30		19	Olsen	257	10/01/14
42		42	12/29/11	73.7	Corson	ShB	SE 1/4 Sec. 24, T 21N, R 26E	0.1	Leased	X			X	30		20	Olsen	257	10/01/14
43		43	12/29/11	316.3	Corson	RnB	W 1/2 Sec. 26, T 21N, R 25E	0.2	Leased	X	6.8		X	30		16	Olsen	275	10/01/14
44		44	12/29/11	308.7	Corson	VeB	S 1/2 Sec. 32, T 21N, R 25E	0.2	Leased	X	0.8		X	30		16	Olsen	280	10/01/14
45		45	12/29/11	160.0	Corson	RcB	NE 1/4 Sec. 32, T 22N, R 26E	0.5	Owned	X	17.4		X	32		5	Olsen	214	10/01/14
46		46	12/29/11	317.1	Corson	RaB	W 1/2 Sec. 35, T 21N, R 25E	0.2	Leased	X			X	32		17	Olsen	275	10/01/14
58		12B	6/5/13	44.7	Corson	ShB	NE 1/4 Sec. 9, T 21N, R 27E	1.9	Leased	X		X	X	30		10	Olsen	248	10/01/14
59		47A	6/5/13	44.5	Corson	ShA	NW 1/4 Sec. 9, T 21N, R 27E	1.9	Owned	X			X	30		8	Olsen	334	10/01/14
60		47B	6/5/13	75.9	Corson	ShB	NW 1/4 Sec. 9, T 21N, R 27E	1.3	Owned	X		X	X	30		10	Olsen	334	10/01/14
72		48	6/5/13	293.7	Corson	VhB	E 1/2 Sec. 16, T 21N, R 27E	0.4	Owned	X	16.3		X	30		5	Olsen	358	10/01/14

Total: 7,551.9

Comments:
Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied.

Part 2: Estimated Nutrient Requirement

Operator: Wulf Cattle Depot **County:** Corson

29.
◉ Actual or Yield Goal
○ Yields indexed by soil productivity (Productivity Index)
○ County Average Yields (SD Agricultural Statistics Service)

Crops in Rotation and Average Yield:
Additional 10% is added to yields for nutrient management purposes.

Line #	Previous Year Crop	County Yield	Actual Yield	Year 1 Crop	County Yield	Yield Goal	Year 2 Crop	County Yield	Yield Goal	Year 3 Crop	County Yield	Yield Goal	Year 4 Crop	County Yield	Yield Goal	Year 5 Crop	County Yield
1	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
2	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
3	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Sunflowers (lbs)		2,915	Corn (bu)		147	Wheat, Sp. (bu)	28
4	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)	65
5	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
6	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)	63
7	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)	1492
8	Oats (bu)		61	Wheat, Sp. (bu)		29	Oats (bu)		61	Wheat, Sp. (bu)		29	Barley (bu)		34	Corn (bu)	63
9	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
10	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
11	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
12	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
13	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
14	Corn (bu)		75	Oats (bu)		61	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
15	Corn (bu)		75	Oats (bu)		61	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
16	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
17	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
18	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		147	Corn (bu)	63
19	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
20	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
21	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
22	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
23	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
24	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
25	Barley, Malting (bu)		34	Corn (bu)		75	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
26	Barley, Malting (bu)		34	Corn (bu)		75	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
27	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
28	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Oats (bu)		61	Sunflowers (lbs)	1492
29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
30	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
31	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
32	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
33	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
34	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
35	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
36	Barley, Malting (bu)		34	Corn (bu)		75	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
37	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
38	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)	28
39	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
40	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
41	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
42	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
43	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
44	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
45	Wheat, Sp. (bu)		29	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Alfalfa (ton) >1 plant/sq.ft.		2	Alfalfa (ton) >1 plant/sq.ft	2
46	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
58	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
59	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
60	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
72	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)	63

Previous Year = 2014
Year 1 = 2015

Tota
Total lbs of N and P2
Total lbs of N and P
Adequate a
However, P2O5 is in excess of removal. At this rate, it will take approximately 7 year(

Developed by SD-DENR, SD-NRCS, and SDSU

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63B
4/08

Part 3: Planned Nutrient Application

Date: 12/27/11 **Operator:** Wulf Cattle Depot **County:** Corson

Part 4: Nutrient Application

Date: 12/27/11 **Operator:** Wulf Cattle Depot **County:** Corson

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	Yield Goal	30. Initial Nutrient Mgt. Plan - N based fields (acres)	31. Nutrient Recommendation - *SDSU Extension Service EC-750* N	P_2O_5	K_2O	32. Manure application based on:	33. Manure Application and Incorporation: Type of Manure (Year of Application)	Type of Application (Time of incorporation)	34. Manure Test: Total N	Inorganic N	Total P2O5	Total K2O	Date Tested	35. Actual or Yield Goal / Variable N (First indexed by soil productivity (Productivity Index)) / County Average Yields (SD Agricultural Statistics Service) lbs/Ton or lbs/1,000 gal	36. Maximum Manure Application Rate To meet N needs	Quantity of Manure per Field	37. Acres of Actual Nutrient Application	38. Manure Application: Actual Manure Rate Applied	Date Manure Applied	Time Period When Manure Applied	39. Nutrients Applied: Commercial lbs/acre N	P_2O_5	K_2O	Manure lbs/acre N	P_2O_5	K_2O	Total lbs/acre N	P_2O_5	K_2O	40. Estimated years to reapplication based on P_2O_5 rate
1	T1631 F1	1	61	64.0	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	64.0	0	Tons/ac			89		0	0	0	0	89	0	0	N/A
2	T1631 F2	2	61	89.0	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	89.0	0	Tons/ac			89			0	0	0	89	0	0	N/A
3	T11198 F8	3	57	103.0	176	12	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	87,000 Gal/ac	8,961,000 Gal	78.0	86,780	Gal/ac	July	Summer	77			99	43	521	176	43	521	N/A
4	T1637 F2	4	61	208.0	92	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	208.0	0	Tons/ac			92	7		0	0	0	92	7	0	N/A
5	T11199 F3	5	29	55.5	92	4	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	55.5	0	Tons/ac			92	4		0	0	0	92	4	0	N/A
6	T11199 F6	6	75	119.9	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	119.9	0	Tons/ac			89			0	0	0	89	0	0	N/A
7	T1764 F1	7	1,822	122.9	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	122.9	0	Tons/ac			74			0	0	0	74	0	0	N/A
8	T11329 F1	8	75	60.2	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	60.2	0	Tons/ac			72			0	0	0	72	0	0	N/A
9	T11329 F2	9	75	279.4	93	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	279.4	0	Tons/ac			93			0	0	0	93	0	0	N/A
10	T1898 F1	10	29	139.8	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	139.8	0	Tons/ac			91			0	0	0	91	0	0	N/A
11	T1426 F1	11	29	145.7	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	145.7	0	Tons/ac			91			0	0	0	91	0	0	N/A
12	T1930 F1	12A	29	80.9	91	5	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	80.9	0	Tons/ac			91	5		0	0	0	91	5	0	N/A
13	T1929 F1	13	29	87.0	91	5	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	87.0	0	Tons/ac			91	5		0	0	0	91	5	0	N/A
14	T11460 F1	14	29	132.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	132.0	0	Tons/ac			79			0	0	0	79	0	0	N/A
15	T1894 F3	15	29	133.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	133.0	0	Tons/ac			79			0	0	0	79	0	0	N/A
16	T1900 F1	16	75	315.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	315.0	0	Tons/ac			90			0	0	0	90	0	0	N/A
17	T1763 F1	17	29	149.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,639 Tons	149.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
18	T1892 F2	18	75	176.7	91	2	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,944 Tons	176.7	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
19	T1892 F3	19	75	143.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,573 Tons	143.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
20	T1901 F1	20	75	288.5	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,174 Tons	288.5	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
21	T10091 F4	21	29	131.5	91	5	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,447 Tons	131.5	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
22	T1767 F2	22	34	109.3	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,202 Tons	109.3	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
23	T1767 F5	23	34	89.3	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	982 Tons	89.3	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
24	T1767 F6	24	34	57.4	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	631 Tons	57.4	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
25	T1638 F1A	25	61	149.4	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,643 Tons	149.4	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
26	T1638 F1B	26	61	150.0	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,650 Tons	150.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
27	T1770 F1	27	34	148.1	90	20	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,629 Tons	148.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
28	T1766 F1	28	1,822	99.2	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	893 Tons	99.2	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
29		29	29	229.4	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,065 Tons	229.4	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
30		30	61	150.0	91	24	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,650 Tons	150.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
31		31	61	64.1	91	24	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	705 Tons	64.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
32		32	61	65.1	91	24	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	716 Tons	65.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
33		33	1,822	158.3	72	40	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,425 Tons	158.3	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
34		34	1,822	38.0	72	40	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	342 Tons	38.0	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
35		35	1,822	317.7	72	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,859 Tons	317.7	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
36		36	61	153.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,683 Tons	153.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
37		37	1,822	157.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,413 Tons	157.0	9	Tons/ac	October	Fall	36			37	76	117	73	76	117	N/A
38		38	29	67.0	91	13	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	737 Tons	67.0	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
39		39	1,822	251.1	91	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	2,762 Tons	251.1	11	Tons/ac	October	Fall	45			45	92	143	90	92	143	N/A
40		40	1,822	156.5	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	8 Tons/ac	1,252 Tons	156.5	8	Tons/ac	October	Fall	58			33	67	104	91	67	104	N/A
41		41	75	85.1	91	2	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	85.1		Tons/ac			91						91			N/A
42		42	75	73.7	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	73.7		Tons/ac			91						91			N/A
43		43	29	309.5	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	309.5		Tons/ac			72						72			N/A
44		44	29	307.9	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	307.9		Tons/ac			72						72			N/A
45		45	2	142.6	88	36	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	17 Tons/ac	2,424 Tons	142.6	17	Tons/ac	October	Fall	19			69	143	221	88	143	221	N/A
46		46	29	317.1	70	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	317.1		Tons/ac			72						72			N/A
58		12B	29	44.7	91	18	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	32,500 Gal/ac	1,452,750 Gal	44.7	32,500	Gal/ac	July	Summer	54			37	16	195	91	16	195	N/A
59		47A	29	44.5	91	22	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	44.5		Tons/ac			91						91			N/A
60		47B	29	75.9	91	18	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	32,500 Gal/ac	2,466,750 Gal	75.9	32,500	Gal/ac	July	Summer	54			37	16	195	91	16	195	N/A
72		48	75	277.4	90	36	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons	277.4		Tons/ac			90						90			N/A

	Acres:	N	P_2O_5
	7,312.3		
	O_5 available for crops:	231,426	735,475
	$2O_5$ required by fields:	358,338	143,872

cres are available based on Nitrogen analysis
s) to build all listed fields up to 50 ppm P (Olsen).

Comments:

Comments:
Manure application Estimate for 2015 Growing Season

Plan Year: 2015

Part 5: Nutrient Balance

41. Nutrient Balance						
Field #	Crop Yield, lb, bu, ton	Estimated Crop N Removal lb/ac	Estimated Crop P_2O_5 removal lb/ac	Nitrogen Balance lb/ac	*P_2O_5 Balance ppm	Legume Credit (Table 2 of EC750)
1	1822	91.1	20.0	28	32	
2	1822	91.1	20.0	28	28	
3	147	176.4	51.5	30	16	
4	1822	91.1	20.0	31	15	
5	1822	91.1	20.0	31	17	
6	75	90.0	26.3	29	18	
7	29	72.5	16.2	32	24	
8	29	72.5	16.2	30	22	
9	1822	91.1	20.0	32	25	
10	1822	91.1	20.0	30	24	
11	1822	91.1	20.0	30	24	
12A	1822	91.1	20.0	30	16	
13	1822	91.1	20.0	30	16	
14	61	79.3	15.3	30	15	
15	61	79.3	15.3	30	16	
16	1822	91.1	20.0	30	46	
17	1822	91.1	20.0	29	26	
18	1822	91.1	20.0	29	23	
19	1822	91.1	20.0	29	24	
20	1822	91.1	20.0	29	30	
21	1822	91.1	20.0	29	20	
22	75	90.0	26.3	30	22	
23	75	90.0	26.3	30	25	
24	75	90.0	26.3	30	39	
25	75	90.0	26.3	30	10	
26	75	90.0	26.3	30	10	
27	75	90.0	26.3	30	14	
28	29	72.5	16.2	31	33	
29	29	72.5	16.2	31	16	
30	1822	91.1	20.0	29	11	
31	1822	91.1	20.0	29	11	
32	1822	91.1	20.0	29	11	
33	29	72.5	16.2	31	15	
34	29	72.5	16.2	31	15	
35	29	72.5	16.2	31	13	
36	75	90.0	26.3	30	27	
37	29	72.5	16.2	31	21	
38	1822	91.1	20.0	29	17	
39	1822	91.1	20.0	29	20	
40	1822	91.1	20.0	30	17	
41	1822	91.1	20.0	30	19	
42	1822	91.1	0.0	30	19	
43	29	72.5	16.2	30	15	
44	29	72.5	16.2	30	15	
45	75	90.0	26.3	32	11	
46	29	72.5	16.2	32	16	
12B	1822	91.1	20.0	30	10	
47A	1822	91.1	20.0	30	7	
47B	1822	91.1	20.0	30	9	
48	75	90.0	26.3	30	5	

*(Total Land Application of P_2O_5 in lb/acre - Total Crop Removal of P_2O_5 in lb/acre)/20 + Soil P_2O_5 in PPM

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

SD-CPA-63B
4/08

Part 1: Field Information

Operator: Wulf Cattle Depot   County: Corson   Date: 11/14/12

Part 2: Estimated Nutrient Requirement

Operator: Wulf Cattle Depot   County: Corson

(29)
- ◉ Actual or Yield Goal
- ○ Yields indexed by soil productivity (Productivity Index)
- ○ County Average Yields (SD Agricultural Statistics Service)

Crops in Rotation and Average Yield:
Additional 10% is added to yields for nutrient management purposes.

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	18. Date added to Plan	19. Beginning acres in field	20. County	21. Soil map unit symbol	22. Field Location: (1/4 Section, Township, Range)	23. Predicted soil loss - RUSLE2 (T/ac/yr)	24. Control of Land	25. 100' Vegetated Buffer	Excluded acres	26. Irrigated	27. No-Till	28. Current Soil Test Levels: N lb/ac 0-2'	N lb/ac 2-4'	Phosphorus (ppm) 0-6"	Phosphorus (ppm) P Test	K (ppm)	Soil Sample Date	Previous Year Crop	Previous Year County Yield	Previous Year Actual Yield	Year 1 Crop	Year 1 County Yield	Year 1 Yield Goal	Year 2 Crop	Year 2 County Yield	Year 2 Yield Goal	Year 3 Crop	Year 3 County Yield	Year 3 Yield Goal	Year 4 Crop	Year 4 County Yield	Year 4 Yield Goal	Year 5 Crop	Year 5 County Yield
1	T1631 F1	1	3/10/10	67.1	Corson	DaA	NW 1/4 Sec 3, T 21N, R 26E	0.6	Owned	X	3.1		X	28		32	Olsen	492	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
2	T1631 F2	2	3/10/10	89.0	Corson	RnB	NW 1/4 Sec. 3, T 21N, R 26E	1.1	Owned	X			X	28		28	Olsen	492	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
3	T11198 F8	3	3/10/10	103.0	Corson	ShB	SW 1/4 Sec 4, T 21N, R 27E	0.1	Owned			X	X	30		16	Olsen	318	10/01/15	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Sunflowers (lbs)		2,915	Corn (bu)		147	Wheat, Sp. (bu)	28
4	T1637 F2	4	3/10/10	228.0	Corson	RcC	E 1/2 Sec 5, T 21, R 26	0.1	Owned	X	20.0		X	31		15	Olsen	288	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)	65
5	T11199 F3	5	3/10/10	61.0	Corson	An	SW 1/4 Sec 5, T 21N, R 27E	0.1	Owned	X	5.5		X	31		17	Olsen	348	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
6	T11199 F6	6	3/10/10	125.0	Corson	RaB	SE 1/4 Sec 5, T 21N, R 27E	0.1	Leased	X	5.1		X	29		18	Olsen	373	10/01/15	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)	63
7	T1764 F1	7	3/10/10	129.4	Corson	ShB	NW 1/4 Sec 6, T 21N, R 27E	0.1	Leased	X	6.5		X	32		24	Olsen	350	10/01/15	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)	1492
8	T11329 F1	8	3/10/10	72.4	Corson	ShB	SE 1/4 Sec 6, T 21N, R 27E	0.1	Owned	X	12.2		X	30		22	Olsen	357	10/01/15	Wheat, Sp. (bu)		29	Barley, Malting (bu)		34	Oats (bu)		61	Wheat, Sp. (bu)		29	Barley (bu)		34	Corn (bu)	63
9	T11329 F2	9	3/10/10	295.6	Corson	ShB	W 1/2 Sec 7, T 21N, R 27E	0.1	Owned	X	16.2		X	32		25	Olsen	289	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
10	T1898 F1	10	3/10/10	139.8	Corson	ShB	NW 1/4 Sec 8, T 21N, R 27E	0.5	Leased	X			X	30		24	Olsen	342	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
11	T1426 F1	11	3/10/10	147.7	Corson	An	NE 1/4 Sec 8, T 21N, R 27E	0.1	Owned	X	2.0		X	30		24	Olsen	342	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
12	T1930 F1	12A	3/10/10	80.9	Corson	ShB	NE 1/4 Sec 9, T 21N, R 27E	0.1	Owned	X			X	30		16	Olsen	248	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
13	T1929 F1	13	3/10/10	89.0	Corson	ShB	SW 1/4 Sec 9, T 21N, R 27E	0.1	Leased	X	2.0		X	30		16	Olsen	248	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
14	T11460 F1	14	3/10/10	150.0	Corson	RsB	NE 1/4 Sec 9, T 22, R 27	0.2	Owned	X	18.0		X	30		15	Olsen	381	10/01/15	Oats (bu)		61	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
15	T1894 F3	15	3/10/10	133.0	Corson	RaA	SE 1/4 Sec 9, T 22, R 27	0.1	Leased	X			X	30		16	Olsen	381	10/01/15	Oats (bu)		61	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
16	T1900 F1	16	3/10/10	315.0	Corson	RsB	E 1/2 Sec 10, T 22N, R 27E	0.2	Leased	X			X	30		46	Olsen	600	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
17	T1763 F1	17	3/10/10	155.5	Corson	RaB	SE 1/4 Sec 13, T 21N, R 26E	1.0	Leased	X	6.5		X	29		26	Olsen	376	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
18	T1892 F2	18	3/10/10	176.7	Corson	DaA	N 1/2 Sec 15, T 22N, R 27E	1.0	Leased	X			X	29		23	Olsen	294	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		147	Corn (bu)	63
19	T1892 F3	19	3/10/10	143.0	Corson	SgA	N 1/2 Sec 15, T 22N, R 27E	1.0	Leased	X			X	29		24	Olsen	294	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
20	T1901 F1	20	3/10/10	292.0	Corson	RsB	E 1/2 Sec 16, T 22N, R 27E	0.5	Leased	X	3.5		X	29		30	Olsen	389	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
21	T10091 F4	21	3/10/10	131.5	Corson	StA	N 1/2 Sec 19, T 22N, R 27E	0.1	Leased	X			X	29		20	Olsen	296	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
22	T1767 F2	22	3/10/10	120.0	Corson	StA	E 1/2 Sec. 30, T 22N, R 27E	0.1	Leased	X	10.7		X	30		22	Olsen	347	10/01/15	Corn (bu)		75	Oats (bu)		61	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
23	T1767 F5	23	3/10/10	105.1	Corson	Gr	N 1/2 Sec 31, T 22N, R 27E	1.0	Leased	X	15.8		X	30		25	Olsen	332	10/01/15	Corn (bu)		75	Oats (bu)		61	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
24	T1767 F6	24	3/10/10	61.0	Corson	ShA	SE 1/4 Sec 31, T 22N, R 27E	0.1	Leased	X	3.6		X	30		39	Olsen	332	10/01/15	Corn (bu)		75	Oats (bu)		61	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
25	T1638 F1A	25	3/10/10	156.4	Corson	RsB	S 1/2 Sec 34, T 22N, R 26E	0.3	Owned	X	7.0		X	30		10	Olsen	395	10/01/15	Corn (bu)		75	Sunflowers (lbs)		1,822	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
26	T1638 F1B	26	3/10/10	154.0	Corson	DaA	S 1/2 Sec 34, T 22N, R 26E	0.1	Owned	X	4.0		X	30		10	Olsen	395	10/01/15	Corn (bu)		75	Sunflowers (lbs)		1,822	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
27	T1770 F1	27	3/10/10	155.5	Corson	ShA	NW 1/4 Sec 34, T 22N, R 27E	0.1	Leased	X	7.4		X	30		14	Olsen	274	10/01/15	Corn (bu)		75	Oats (bu)		61	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
28	T1766 F1	28	3/10/10	99.2	Corson	An	NE 1/4 Sec 34, T 22N, R 27E	0.1	Leased	X	0.0		X	31		33	Olsen	572	10/01/15	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Wheat, Sp. (bu)		29	Oats (bu)		61	Sunflowers (lbs)	1492
29		29	12/29/11	229.4	Corson	VhB	N 1/2 Sec 4, T 20N, R 25E	0.3	Leased	X			X	31		16	Olsen	280	10/01/15	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
30		30	12/29/11	155.7	Corson	RaC	NW 1/4 Sec 4, T 21N, R 26E	0.1	Owned	X	5.7		X	29		11	Olsen	333	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
31		31	12/29/11	68.4	Corson	RnB	N 1/2 Sec 4, T 21N, R 26E	0.0	Owned	X	4.3		X	29		11	Olsen	333	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
32		32	12/29/11	70.4	Corson	RpC	NE 1/4 Sec 4, T 21N, R 26E	0.4	Owned	X	5.3		X	29		11	Olsen	333	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
33		33	12/29/11	183.0	Corson	RaB	N 1/2 Sec 7, T 21N, R 26E	0.1	Leased	X	24.7		X	31		15	Olsen	339	10/01/15	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
34		34	12/29/11	38.0	Corson	RcB	NE 1/4 Sec 7, T 21N, R 26E	0.2	Leased	X			X	31		15	Olsen	339	10/01/15	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
35		35	12/29/11	317.7	Corson	RnB	W 1/2 Sec 10, T 21N, R 25E	0.3	Leased	X			X	31		13	Olsen	424	10/01/15	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
36		36	12/29/11	159.1	Corson	VeB	SE 1/4 Sec 10, T 21N, R 25E	0.2	Leased	X	6.1		X	30		27	Olsen	576	10/01/15	Corn (bu)		75	Sunflowers (lbs)		1,822	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
37		37	12/29/11	157.0	Corson	Gr	S 1/2 Sec 11, T 21N, R 25E	0.1	Leased	X			X	31		21	Olsen	516	10/01/15	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
38		38	12/29/11	67.0	Corson	RnB	W 1/2 Sec 12, T 21N, R 25E	0.1	Leased	X			X	29		17	Olsen	334	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)	28
39		39	12/29/11	254.2	Corson	RnB	E 1/2 Sec 14, T 21N, R 25E	0.1	Leased	X	3.1		X	29		20	Olsen	376	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
40		40	12/29/11	156.5	Corson	SgB	NE 1/4 Sec 23, T 21N, R 25E	0.1	Leased	X			X	30		17	Olsen	376	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
41		41	12/29/11	85.1	Corson	An	SE 1/4 Sec 24, T 21N, R 26E	0.0	Leased	X			X	30		19	Olsen	257	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
42		42	12/29/11	73.7	Corson	ShB	SE 1/4 Sec. 24, T 21N, R 26E	0.1	Leased	X			X	30		19	Olsen	257	10/01/15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
43		43	12/29/11	316.3	Corson	RnB	W 1/2 Sec 26, T 21N, R 25E	0.2	Leased	X	6.8		X	30		15	Olsen	275	10/01/15	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
44		44	12/29/11	308.7	Corson	VeB	S 1/2 Sec 32, T 21N, R 25E	0.2	Leased	X	0.8		X	30		15	Olsen	280	10/01/15	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
45		45	12/29/11	160.0	Corson	RcB	NE 1/4 Sec. 32, T 22N, R 26E	0.5	Owned	X	17.4		X	32		11	Olsen	214	10/01/15	Corn (bu)		75	Alfalfa (ton) >1 plant/sq.ft		2	Wheat, Sp. (bu)		29	Corn (bu)		75	Alfalfa (ton) >1 plant/sq.ft		2	Alfalfa (ton) >1 plant/sq.ft	2
46		46	12/29/11	317.1	Corson	RaB	W 1/2 Sec. 35, T 21N, R 25E	0.2	Leased	X			X	32		16	Olsen	275	10/01/15	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
58		12B	6/5/13	44.7	Corson	ShB	NE 1/4 Sec. 9, T 21N, R 27E	1.9	Leased	X		X	X	30		10	Olsen	248	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
59		47A	6/5/13	44.5	Corson	ShA	NW 1/4 Sec 9, T 21N, R 27E	1.9	Owned	X			X	30		7	Olsen	334	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
60		47B	6/5/13	75.9	Corson	ShB	NW 1/4 Sec 9, T 21N, R 27E	1.3	Owned	X		X	X	30		9	Olsen	334	10/01/15	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
72		48	6/5/13	293.7	Corson	VhB	E 1/2 Sec 16, T 21N, R 27E	0.4	Owned	X	16.3		X	30		5	Olsen	358	10/01/15	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)	1492

Total: 7,551.9

Comments:
Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied

Previous Year = 2015
Year 1 = 2016

Tota
Total lbs of N and P2
Total lbs of N and P
Adequate a
However, P2O5 is in excess of removal At this rate, it will take approximately 7 year

Developed by SD-DENR, SD-NRCS, and SDSU

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 3: Planned Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson

17. Field ID (Include maps to illustrate location); 30. Initial Nutrient Mgt. Plan - N based fields (acres); 31. Nutrient Recommendation - SDSU Extension Service EC-750; 32. Manure application based on; 33. Manure Application and Incorporation; 34. Manure Test; 35. ◉ Actual or Yield Goal / ○ Yields indexed by soil productivity (Productivity Index) / ○ County Average Yields (SD Agricultural Statistics Service) — Available N (First crop year); 36. Maximum Manure Application Rate

Line #	Name or Tract	Field #	Yield Goal	Initial Nutrient Mgt. Plan - N based fields (acres)	N	P_2O_5	K_2O	Manure application based on	Type of Manure (Year of Application)		Type of Application (Time of incorporation)	Total N	Inorganic N	Total P2O5	Total K2O	Date Tested	Available N lbs/Ton or lbs/1,000 gal	To meet N needs	Quantity of Manure per Field
1	T1631 F1	1	61	64.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	576 Tons
2	T1631 F2	2	61	89.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	801 Tons
3	T11198 F8	3	57	103.0	176	0	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	75,600 Gal/ac	7,786,800 Gal
4	T1637 F2	4	61	208.0	89	3	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	2,288 Tons
5	T11199 F3	5	29	55.5	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	611 Tons
6	T11199 F6	6	75	119.9	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,079 Tons
7	T1764 F1	7	1,822	122.9	88	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,352 Tons
8	T11329 F1	8	75	60.2	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	361 Tons
9	T11329 F2	9	75	279.4	70	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,515 Tons
10	T1898 F1	10	29	139.8	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,538 Tons
11	T1426 F1	11	29	145.7	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,603 Tons
12	T1930 F1	12A	29	80.9	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	890 Tons
13	T1929 F1	13	29	87.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	957 Tons
14	T11460 F1	14	29	132.0	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,452 Tons
15	T1894 F3	15	29	133.0	91	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,463 Tons
16	T1900 F1	16	75	315.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
17	T1763 F1	17	29	149.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,639 Tons
18	T1892 F2	18	75	176.7	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,944 Tons
19	T1892 F3	19	75	143.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,573 Tons
20	T1901 F1	20	75	288.5	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	8 Tons/ac	2,308 Tons
21	T10091 F4	21	29	131.5	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
22	T1767 F2	22	34	109.3	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
23	T1767 F5	23	34	89.3	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
24	T1767 F6	24	34	57.4	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
25	T1638 F1A	25	61	149.4	91	18	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
26	T1638 F1B	26	61	150.0	91	18	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
27	T1770 F1	27	34	148.1	79	4	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
28	T1766 F1	28	1,822	99.2	78	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
29		29	29	229.4	90	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
30		30	61	150.0	74	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
31		31	61	64.1	74	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
32		32	61	65.1	74	50	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
33		33	1,822	158.3	72	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
34		34	1,822	38.0	72	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
35		35	1,822	317.7	72	30	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
36		36	61	153.0	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
37		37	1,822	157.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
38		38	29	67.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
39		39	1,822	251.1	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
40		40	1,822	156.5	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
41		41	75	85.1	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	766 Tons
42		42	75	73.7	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	663 Tons
43		43	29	309.5	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,405 Tons
44		44	29	307.9	91	9	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,387 Tons
45		45	2	142.6	78	12	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,426 Tons
46		46	29	317.1	89	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,488 Tons
58		12B	29	44.7	90	20	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	39,600 Gal/ac	1,770,120 Gal
59		47A	29	44.5	90	29	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	401 Tons
60		47B	29	75.9	90	23	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	39,600 Gal/ac	3,005,640 Gal
72		48	1,822	277.4	91	27	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons

		N	P_2O_5
l Acres:	7,312.3		
O5 available for crops:		231,426	735,475
2O5 required by fields:		352,513	148,767

icres are available based on Nitrogen analysis
's) to build all listed fields up to 50 ppm P (Olsen)

Comments:

Part 4: Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson **Date:** 11/14/12

37. Acres of Actual Nutrient Application; 38. Manure Application; 39. Nutrients Applied; 40. Estimated years to reapplication based on P_2O_5 rate

Line #	Acres of Actual Nutrient Application	Actual Manure Rate Applied		Date Manure Applied	Time Period When Manure Applied	Commercial lbs/acre N	Commercial lbs/acre P_2O_5	Commercial lbs/acre K_2O	Manure lbs/acre N	Manure lbs/acre P_2O_5	Manure lbs/acre K_2O	Total lbs/acre N	Total lbs/acre P_2O_5	Total lbs/acre K_2O	Estimated years to reapplication based on P_2O_5 rate
1	64.0	9	Tons/ac	October	Fall	37		0	37	76	117	74	76	117	N/A
2	89.0	9	Tons/ac	October	Fall	37	0		37	76	117	74	76	117	N/A
3	78.0	75,800	Gal/ac	July	Summer	90	0		86	38	455	176	38	455	N/A
4	208.0	11	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N/A
5	55.5	11	Tons/ac	October	Fall	44	0		45	92	143	89	92	143	N/A
6	119.9	9	Tons/ac	October	Fall	37	0		37	76	117	74	76	117	N/A
7	122.9	11	Tons/ac	October	Fall	43	0		45	92	143	88	92	143	N/A
8	60.2	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
9	279.4	9	Tons/ac	October	Fall	33	0		37	76	117	70	76	117	N/A
10	139.8	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
11	145.7	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
12	80.9	11	Tons/ac	October	Fall	45	13		45	92	143	90	105	143	N/A
13	87.0	11	Tons/ac	October	Fall	45	13		45	92	143	90	105	143	N/A
14	132.0	11	Tons/ac	October	Fall	45	9		45	92	143	90	101	143	N/A
15	133.0	11	Tons/ac	October	Fall	45	9		45	92	143	90	101	143	N/A
16	315.0	0	Tons/ac			90	0		0	0	0	90	0	0	N/A
17	149.0	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
18	176.7	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
19	143.0	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
20	288.5	8	Tons/ac	October	Fall	58	0		33	67	104	91	67	104	N/A
21	131.5	0	Tons/ac			91	0		0	0	0	91	0	0	N/A
22	109.3	0	Tons/ac			79	0		0	0	0	79	0	0	N/A
23	89.3	0	Tons/ac			79	0		0	0	0	79	0	0	N/A
24	57.4	0	Tons/ac			79	0		0	0	0	79	0	0	N/A
25	149.4	0	Tons/ac			91	0		0	0	0	91	0	0	N/A
26	150.0	0	Tons/ac			91	0		0	0	0	91	0	0	N/A
27	148.1	0	Tons/ac			79	0		0	0	0	79	0	0	N/A
28	99.2	0	Tons/ac			78	0		0	0	0	78	0	0	N/A
29	229.4	0	Tons/ac			90	0		0	0	0	90	0	0	N/A
30	150.0	0	Tons/ac			74	0		0	0	0	74	0	0	N/A
31	64.1	0	Tons/ac			74	0		0	0	0	74	0	0	N/A
32	65.1	0	Tons/ac			74	0		0	0	0	74	0	0	N/A
33	158.3	0	Tons/ac			72	0		0	0	0	72	0	0	N/A
34	38.0	0	Tons/ac			72	0		0	0	0	72	0	0	N/A
35	317.7	0	Tons/ac			72	0		0	0	0	72	0	0	N/A
36	153.0	0	Tons/ac			91	0		0	0	0	91	0	0	N/A
37	157.0	0	Tons/ac			72	0		0	0	0	72	0	0	N/A
38	67.0	0	Tons/ac			74	0		0	0	0	74	0	0	N/A
39	251.1	0	Tons/ac			91	0		0	0	0	91	0	0	N/A
40	156.5	0	Tons/ac			90	0		0	0	0	90	0	0	N/A
41	85.1	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
42	73.7	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
43	309.5	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
44	307.9	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
45	142.6	10	Tons/ac	October	Fall	37	0		41	84	130	78	84	130	N/A
46	317.1	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
58	44.7	39,600	Gal/ac	July	Summer	45			45	20	238	90	20	238	N/A
59	44.5	9	Tons/ac			53			37	76	117	90	76	117	N/A
60	75.9	39,600	Gal/ac	July	Summer	45			45	20	238	90	20	238	N/A
72	277.4		Tons/ac			91						91			N/A

Comments:
Manure application Estimate for 2016 Growing Season

Plan Year: 2016

Part 5: Nutrient Balance

41. Nutrient Balance						
Field #	Crop Yield, lb, bu, ton	Estimated Crop N Removal lb/ac	Estimated Crop P_2O_5 removal lb/ac	Nitrogen Balance lb/ac	*P_2O_5 Balance ppm	Legume Credit (Table 2 of EC750)
1	29	72.5	16.2	30	35	
2	29	72.5	16.2	30	29	
3	147	176.4	51.5	30	17	
4	75	90.0	26.3	30	18	
5	75	90.0	26.3	30	21	
6	29	72.5	16.2	31	20	
7	75	90.0	26.3	30	28	
8	34	51.0	13.9	30	24	
9	29	72.5	0.0	30	27	
10	75	90.0	26.3	30	27	
11	75	90.0	26.3	30	27	
12A	75	90.0	26.3	30	20	
13	75	90.0	26.3	30	20	
14	1822	91.1	20.0	29	19	
15	1822	91.1	20.0	29	20	
16	75	90.0	26.3	30	45	
17	75	90.0	26.3	30	29	
18	75	90.0	26.3	30	26	
19	75	90.0	26.3	30	27	
20	75	90.0	26.3	30	32	
21	75	90.0	26.3	30	19	
22	61	79.3	15.3	30	21	
23	61	79.3	15.3	30	24	
24	61	79.3	15.3	30	38	
25	1822	91.1	20.0	30	9	
26	1822	91.1	20.0	30	9	
27	61	79.3	15.3	30	13	
28	61	79.3	15.3	30	32	
29	1822	91.1	20.0	30	15	
30	29	72.5	16.2	31	10	
31	29	72.5	16.2	31	10	
32	29	72.5	16.2	31	10	
33	29	72.5	16.2	31	14	
34	29	72.5	16.2	31	14	
35	29	72.5	16.2	31	12	
36	1822	91.1	20.0	30	26	
37	29	72.5	16.2	31	20	
38	29	72.5	16.2	31	16	
39	75	90.0	26.3	30	19	
40	75	90.0	26.3	30	16	
41	29	72.5	16.2	30	22	
42	29	72.5	16.2	30	22	
43	1822	91.1	20.0	30	19	
44	1822	91.1	20.0	30	18	
45	2	110.0	24.0	32	14	
46	1822	91.1	20.0	32	19	
12B	75	90.0	26.3	30	10	
47A	75	90.0	26.3	30	9	
47B	75	90.0	26.3	30	9	
48	1822	91.1	20.0	30	5	

*(Total Land Application of P_2O_5 in lb/acre - Total Crop Removal of P_2O_5 in lb/acre)/20 + Soil P_2O_5 in PPM

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 1: Field Information

Operator: Wulf Cattle Depot County: Corson Date: 11/14/12

Line #	17. Field ID (Include maps to illustrate location) Name or Tract	Field #	18. Date added to Plan	19. Beginning acres in field	20. County	21. Soil map unit symbol	22. Field Location: (1/4 Section, Township, Range) 1/4	Sec	T	R	23. Predicted soil loss - RUSLE2 (T/ac/yr)	24. Control of Land	100' Vegetated Buffer	25. Excluded acres	26. Irrigated	27. No-Till	28. Current Soil Test Levels: N lb/ac 0-2'	N lb/ac 2-4'	Phosphorus (ppm) 0-6"	P Test	K (ppm)	Soil Sample Date
1	T1631 F1	1	3/10/10	67.1	Corson	DaA	NW 1/4	3	21N	26E	0.6	Owned	X	3.1		X	30		35	Olsen	492	10/01/16
2	T1631 F2	2	3/10/10	89.0	Corson	RnB	NW 1/4	3	21N	26E	1.1	Owned	X			X	30		29	Olsen	492	10/01/16
3	T11198 F8	3	3/10/10	103.0	Corson	ShB	SW 1/4	4	21N	27E	0.1	Owned			X	X	30		17	Olsen	318	10/01/16
4	T1637 F2	4	3/10/10	228.0	Corson	RcC	E 1/2	5	21	26	0.1	Owned	X	20.0		X	30		18	Olsen	288	10/01/16
5	T11199 F3	5	3/10/10	61.0	Corson	An	SW 1/4	5	21N	27E	0.1	Owned	X	5.5		X	30		21	Olsen	348	10/01/16
6	T11199 F6	6	3/10/10	125.0	Corson	RaB	SE 1/4	5	21N	27E	0.1	Leased	X	5.1		X	31		20	Olsen	373	10/01/16
7	T1764 F1	7	3/10/10	129.4	Corson	ShB	NW 1/4	6	21N	27E	0.1	Leased	X	6.5		X	30		28	Olsen	350	10/01/16
8	T11329 F1	8	3/10/10	72.4	Corson	ShB	SE 1/4	6	21N	27E	0.1	Owned	X	12.2		X	30		24	Olsen	357	10/01/16
9	T11329 F2	9	3/10/10	295.6	Corson	ShB	W 1/2	7	21N	27E	0.1	Owned	X	16.2		X	30		27	Olsen	289	10/01/16
10	T1898 F1	10	3/10/10	139.8	Corson	ShB	NW 1/4	8	21N	27E	0.5	Leased	X			X	30		27	Olsen	342	10/01/16
11	T1426 F1	11	3/10/10	147.7	Corson	An	NE 1/4	8	21N	27E	0.1	Owned	X	2.0		X	30		27	Olsen	342	10/01/16
12	T1930 F1	12A	3/10/10	80.9	Corson	ShB	NE 1/4	9	21N	27E	0.1	Owned	X			X	30		20	Olsen	248	10/01/16
13	T1929 F1	13	3/10/10	89.0	Corson	ShB	SW 1/4	9	21N	27E	0.1	Leased	X	2.0		X	30		20	Olsen	248	10/01/16
14	T11460 F1	14	3/10/10	150.0	Corson	RsB	NE 1/4	9	22	27	0.2	Owned	X	18.0		X	29		19	Olsen	381	10/01/16
15	T1894 F3	15	3/10/10	133.0	Corson	RaA	SE 1/4	9	22	27	0.1	Leased	X			X	29		20	Olsen	381	10/01/16
16	T1900 F1	16	3/10/10	315.0	Corson	RsB	E 1/2	10	22N	27E	0.2	Leased	X			X	30		45	Olsen	600	10/01/16
17	T1763 F1	17	3/10/10	155.5	Corson	RaB	SE 1/4	13	21N	26E	1.0	Leased	X	6.5		X	30		29	Olsen	376	10/01/16
18	T1892 F2	18	3/10/10	176.7	Corson	DaA	N 1/2	15	22N	27E	1.0	Leased	X			X	30		26	Olsen	294	10/01/16
19	T1892 F3	19	3/10/10	143.0	Corson	SgA	N 1/2	15	22N	27E	1.0	Leased	X			X	30		27	Olsen	294	10/01/16
20	T1901 F1	20	3/10/10	292.0	Corson	RsB	E 1/2	16	22N	27E	0.5	Leased	X	3.5		X	30		32	Olsen	389	10/01/16
21	T10091 F4	21	3/10/10	131.5	Corson	StA	N 1/2	19	22N	27E	0.1	Leased	X			X	30		19	Olsen	296	10/01/16
22	T1767 F2	22	3/10/10	120.0	Corson	StA	E 1/2	30	22N	27E	0.1	Leased	X	10.7		X	30		21	Olsen	347	10/01/16
23	T1767 F5	23	3/10/10	105.1	Corson	Gr	N 1/2	31	22N	27E	1.0	Leased	X	15.8		X	30		24	Olsen	332	10/01/16
24	T1767 F6	24	3/10/10	61.0	Corson	ShA	SE 1/4	31	22N	27E	0.1	Leased	X	3.6		X	30		38	Olsen	332	10/01/16
25	T1638 F1A	25	3/10/10	156.4	Corson	RsB	S 1/2	34	22N	26E	0.3	Owned	X	7.0		X	30		9	Olsen	395	10/01/16
26	T1638 F1B	26	3/10/10	154.0	Corson	DaA	S 1/2	34	22N	26E	0.1	Owned	X	4.0		X	30		9	Olsen	395	10/01/16
27	T1770 F1	27	3/10/10	155.5	Corson	ShA	NW 1/4	34	22N	27E	0.1	Leased	X	7.4		X	30		13	Olsen	274	10/01/16
28	T1766 F1	28	3/10/10	99.2	Corson	An	NE 1/4	34	22N	27E	0.1	Leased	X	0.0		X	30		32	Olsen	572	10/01/16
29		29	12/29/11	229.4	Corson	VhB	N 1/2	4	20N	25E	0.3	Leased	X			X	30		15	Olsen	280	10/01/16
30		30	12/29/11	155.7	Corson	RaC	NW 1/4	4	21N	26E	0.1	Owned	X	5.7		X	31		10	Olsen	333	10/01/16
31		31	12/29/11	68.4	Corson	RnB	N 1/2	4	21N	26E	0.0	Owned	X	4.3		X	31		10	Olsen	333	10/01/16
32		32	12/29/11	70.4	Corson	RpC	NE 1/4	4	21N	26E	0.4	Owned	X	5.3		X	31		10	Olsen	333	10/01/16
33		33	12/29/11	183.0	Corson	RaB	N 1/2	7	21N	26E	0.1	Leased	X	24.7		X	31		14	Olsen	339	10/01/16
34		34	12/29/11	38.0	Corson	RcB	NE 1/4	7	21N	26E	0.2	Leased	X			X	31		14	Olsen	339	10/01/16
35		35	12/29/11	317.7	Corson	RnB	W 1/2	10	21N	25E	0.3	Leased	X			X	31		12	Olsen	424	10/01/16
36		36	12/29/11	159.1	Corson	VeB	SE 1/4	10	21N	25E	0.2	Leased	X	6.1		X	30		26	Olsen	576	10/01/16
37		37	12/29/11	157.0	Corson	Gr	S 1/2	11	21N	25E	0.1	Leased	X			X	31		20	Olsen	516	10/01/16
38		38	12/29/11	67.0	Corson	RnB	W 1/2	12	21N	25E	0.1	Leased	X			X	31		16	Olsen	334	10/01/16
39		39	12/29/11	254.2	Corson	RnB	E 1/2	14	21N	25E	0.1	Leased	X	3.1		X	30		19	Olsen	376	10/01/16
40		40	12/29/11	156.5	Corson	SgB	NE 1/4	23	21N	25E	0.1	Leased	X			X	30		16	Olsen	376	10/01/16
41		41	12/29/11	85.1	Corson	An	SE 1/4	24	21N	26E	0.0	Leased	X			X	30		22	Olsen	257	10/01/16
42		42	12/29/11	73.7	Corson	ShB	SE 1/4	24	21N	26E	0.1	Leased	X			X	30		22	Olsen	257	10/01/16
43		43	12/29/11	316.3	Corson	RnB	W 1/2	26	21N	25E	0.2	Leased	X	6.8		X	30		19	Olsen	275	10/01/16
44		44	12/29/11	308.7	Corson	VeB	S 1/2	32	21N	25E	0.2	Leased	X	0.8		X	30		18	Olsen	280	10/01/16
45		45	12/29/11	160.0	Corson	RcB	NE 1/4	32	22N	26E	0.5	Owned	X	17.4		X	32		14	Olsen	214	10/01/16
46		46	12/29/11	317.1	Corson	RaB	W 1/2	35	21N	25E	0.2	Leased	X			X	32		19	Olsen	275	10/01/16
58		12B	6/5/13	44.7	Corson	ShB	NE 1/4	9	21N	27E	1.9	Leased	X		X	X	30		10	Olsen	248	10/01/16
59		47A	6/5/13	44.5	Corson	ShA	NW 1/4	9	21N	27E	1.9	Owned	X			X	30		9	Olsen	334	10/01/16
60		47B	6/5/13	75.9	Corson	ShB	NW 1/4	9	21N	27E	1.3	Owned	X		X	X	30		9	Olsen	334	10/01/16
72		48	6/5/13	293.7	Corson	VhB	E 1/2	16	21N	27E	0.4	Owned	X	16.3		X	30		5	Olsen	358	10/01/16
		Total:		7,551.9																		

Comments:
Soil Tests are projected values only, based off previous soil tests, estimated yields and nutrients applied

Part 2: Estimated Nutrient Requirement

Operator: Wulf Cattle Depot County: Corson

29.
◉ Actual or Yield Goal
○ Yields indexed by soil productivity (Productivity Index)
○ County Average Yields (SD Agricultural Statistics Service)

Crops in Rotation and Average Yield:
Additional 10% is added to yields for nutrient management purposes.

Line #	Previous Year Crop	County Yield	Actual Yield	Year 1 Crop	County Yield	Yield Goal	Year 2 Crop	County Yield	Yield Goal	Year 3 Crop	County Yield	Yield Goal	Year 4 Crop	County Yield	Yield Goal	Year 5 Crop	County Yield
1	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
2	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		55	Oats (bu)	65
3	Corn (bu)		147	Corn (bu)		147	Corn (bu)		147	Sunflowers (lbs)		2,915	Corn (bu)		147	Wheat, Sp. (bu)	28
4	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Corn (bu)		75	Oats (bu)	65
5	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
6	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)	63
7	Corn (bu)		75	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)	1492
8	Barley (bu)		34	Corn (bu)		75	Oats (bu)		61	Wheat, Sp. (bu)		29	Barley (bu)		34	Corn (bu)	63
9	Wheat, Sp. (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
10	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
11	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
12	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
13	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
14	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
15	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
16	Corn (bu)		75	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
17	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
18	Corn (bu)		75	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		147	Corn (bu)	63
19	Corn (bu)		75	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
20	Corn (bu)		75	Corn (bu)		75	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Corn (bu)	63
21	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
22	Oats (bu)		61	Barley, Malting (bu)		34	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
23	Oats (bu)		61	Barley, Malting (bu)		34	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
24	Oats (bu)		61	Barley, Malting (bu)		34	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
25	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
26	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
27	Oats (bu)		61	Barley, Malting (bu)		34	Wheat, Sp. (bu)		29	Corn (bu)		75	Oats (bu)		61	Barley, Malting (bu)	
28	Oats (bu)		61	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)		29	Oats (bu)		61	Sunflowers (lbs)	1492
29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
30	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
31	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
32	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)	65
33	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
34	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
35	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
36	Sunflowers (lbs)		1,822	Oats (bu)		61	Barley, Malting (bu)		34	Corn (bu)		75	Sunflowers (lbs)		1,822	Oats (bu)	65
37	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)	1492
38	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Barley, Malting (bu)		34	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)	28
39	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
40	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Corn (bu)		75	Sunflowers (lbs)	1492
41	Wheat, Sp. (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
42	Wheat, Sp. (bu)		29	Corn (bu)		75	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Corn (bu)	63
43	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
44	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
45	Alfalfa (ton) >1 plant/sq.ft.		2	Alfalfa (ton) >1 plant/sq.ft		2	Wheat, Sp. (bu)		29	Corn (bu)		75	Alfalfa (ton) >1 plant/sq.ft.		2	Alfalfa (ton) >1 plant/sq.ft	2
46	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Wheat, Sp. (bu)		29	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28
58	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
59	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
60	Corn (bu)		75	Wheat, Sp. (bu)		29	Corn (bu)		75	Sunflowers (lbs)		1,822	Corn (bu)		75	Wheat, Sp. (bu)	28
72	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)		29	Oats (bu)		61	Corn (bu)		75	Sunflowers (lbs)		1,822	Wheat, Sp. (bu)	28

Previous Year = 2016
Year 1 = 2017

Tota
Total lbs of N and P2
Total lbs of N and P
Adequate a
However, P2O5 is in excess of removal. At this rate, it will take approximately 7 year(

NUTRIENT MANAGEMENT PLAN
FOR
SOUTH DAKOTA ANIMAL FEEDING OPERATIONS

Part 3: Planned Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson

17. Line #	Field ID (Include maps to illustrate location) Name or Tract	Field #	Yield Goal	30. Initial Nutrient Mgt. Plan - N based fields (acres)	31. Nutrient Recommendation - SDSU Extension Service EC-750 N	P_2O_5	K_2O	32. Manure application based on:	33. Manure Application and Incorporation: Type of Manure (Year of Application)		Type of Application (Time of incorporation)	34. Manure Test: Total N	Inorganic N	Total P2O5	Total K2O	Date Tested	35. Actual or Yield Goal / Available Nitrogen (First crop year) / County Average Yields (SD Agricultural Statistics Service): lbs/Ton or lbs/1,000 gal	36. Maximum Manure Application Rate (Yield indexed by soil productivity (Productivity Index)): To meet N needs	Quantity of Manure per Field
1	T1631 F1	1	61	64.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	5 Tons/ac	320 Tons
2	T1631 F2	2	61	89.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
3	T11198 F8	3	57	103.0	176	0	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	87,900 Gal/ac	9,053,700 Gal
4	T1637 F2	4	61	208.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
5	T11199 F3	5	29	55.5	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
6	T11199 F6	6	75	119.9	89	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
7	T1764 F1	7	1,822	122.9	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
8	T11329 F1	8	75	60.2	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
9	T11329 F2	9	75	279.4	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
10	T1898 F1	10	29	139.8	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
11	T1426 F1	11	29	145.7	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
12	T1930 F1	12A	29	80.9	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
13	T1929 F1	13	29	87.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
14	T11460 F1	14	29	132.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
15	T1894 F3	15	29	133.0	74	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
16	T1900 F1	16	75	315.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
17	T1763 F1	17	29	149.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
18	T1892 F2	18	75	176.7	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
19	T1892 F3	19	75	143.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
20	T1901 F1	20	75	288.5	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
21	T10091 F4	21	29	131.5	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	1,184 Tons
22	T1767 F2	22	34	109.3	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	656 Tons
23	T1767 F5	23	34	89.3	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	536 Tons
24	T1767 F6	24	34	57.4	51	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	344 Tons
25	T1638 F1A	25	61	149.4	79	17	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,494 Tons
26	T1638 F1B	26	61	150.0	79	17	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,500 Tons
27	T1770 F1	27	34	148.1	51	5	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	6 Tons/ac	889 Tons
28	T1766 F1	28	1,822	99.2	91	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,091 Tons
29		29	29	229.4	72	10	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,065 Tons
30		30	61	150.0	78	14	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,500 Tons
31		31	61	64.1	78	14	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	641 Tons
32		32	61	65.1	78	14	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	651 Tons
33		33	1,822	158.3	90	11	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,741 Tons
34		34	1,822	38.0	90	11	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	418 Tons
35		35	1,822	317.7	90	15	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	3,495 Tons
36		36	61	153.0	79	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,530 Tons
37		37	1,822	157.0	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,727 Tons
38		38	29	67.0	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	603 Tons
39		39	1,822	251.1	91	2	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	2,762 Tons
40		40	1,822	156.5	91	7	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	1,722 Tons
41		41	75	85.1	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	936 Tons
42		42	75	73.7	90	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	11 Tons/ac	811 Tons
43		43	29	309.5	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,786 Tons
44		44	29	307.9	72	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,771 Tons
45		45	2	142.6	78	5	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	10 Tons/ac	1,426 Tons
46		46	29	317.1	70	0	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	9 Tons/ac	2,854 Tons
58		12B	29	44.7	72	60	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	31,600 Gal/ac	1,412,520 Gal
59		47A	29	44.5	72	70	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons
60		47B	29	75.9	72	70	0	Nitrogen need	Livestock (1st Year)	Liquid	Sprinkling	2.0	1.3	0.5	6.0	06/06/11	1.1	31,600 Gal/ac	2,398,440 Gal
72		48	29	277.4	72	105	0	Nitrogen need	Livestock (1st Year)	Solid	Broadcast (None)	12.2	1.0	8.4	13.0	05/25/11	4.1	0 Tons/ac	0 Tons

l Acres:	7,312.3	
	N	**P_2O_5**
O5 available for crops:	231,426	735,475
2O5 required by fields:	354,370	142,218

cres are available based on Nitrogen analysis
s) to build all listed fields up to 50 ppm P (Olsen).

Comments:

Part 4: Nutrient Application

Date: 11/14/12 **Operator:** Wulf Cattle Depot **County:** Corson **Date:** 11/14/12

Line #	37. Acres of Actual Nutrient Application	38. Manure Application: Actual Manure Rate Applied		Date Manure Applied	Time Period When Manure Applied	39. Nutrients Applied: Commercial lbs/acre N	Commercial P_2O_5	Commercial K_2O	Manure lbs/acre N	Manure P_2O_5	Manure K_2O	Total lbs/acre N	Total P_2O_5	Total K_2O	40. Estimated years to reapplication based on P_2O_5 rate
1	64.0	5	Tons/ac	October	Fall	59		0	20	42	65	79	42	65	N/A
2	89.0		Tons/ac			79	0					79	0		N/A
3	78.0	88,100	Gal/ac	July	Summer	76	0		100	44	529	176	44	529	N/A
4	208.0		Tons/ac			79	0					79	0		N/A
5	55.5		Tons/ac			72	0					72	0		N/A
6	119.9		Tons/ac			89	0					89	0		N/A
7	122.9		Tons/ac			91	0					91	0		N/A
8	60.2		Tons/ac			90	0					90	0		N/A
9	279.4		Tons/ac			90	0					90	0		N/A
10	139.8		Tons/ac			72	0					72	0		N/A
11	145.7		Tons/ac			72	0					72	0		N/A
12	80.9		Tons/ac			72	0					72	0		N/A
13	87.0		Tons/ac			72	0					72	0		N/A
14	132.0		Tons/ac			74	0					74	0		N/A
15	133.0		Tons/ac			74	10					74	10		N/A
16	315.0		Tons/ac			90	0					90	0		N/A
17	149.0		Tons/ac			72	0					72	0		N/A
18	176.7		Tons/ac			90	0					90	0		N/A
19	143.0		Tons/ac			90	0					90	0		N/A
20	288.5		Tons/ac			90	0					90	0		N/A
21	131.5	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
22	109.3	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
23	89.3	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
24	57.4	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
25	149.4	10	Tons/ac	October	Fall	38	0		41	84	130	79	84	130	N/A
26	150.0	10	Tons/ac	October	Fall	38	0		41	84	130	79	84	130	N/A
27	148.1	6	Tons/ac	October	Fall	27	0		24	50	78	51	50	78	N/A
28	99.2	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
29	229.4	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
30	150.0	10	Tons/ac	October	Fall	37	0		41	84	130	78	84	130	N/A
31	64.1	10	Tons/ac	October	Fall	37	0		41	84	130	78	84	130	N/A
32	65.1	10	Tons/ac	October	Fall	37	0		41	84	130	78	84	130	N/A
33	158.3	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
34	38.0	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
35	317.7	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
36	153.0	10	Tons/ac	October	Fall	38	0		41	84	130	79	84	130	N/A
37	157.0	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
38	67.0	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
39	251.1	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
40	156.5	11	Tons/ac	October	Fall	46	0		45	92	143	91	92	143	N/A
41	85.1	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
42	73.7	11	Tons/ac	October	Fall	45	0		45	92	143	90	92	143	N/A
43	309.5	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
44	307.9	9	Tons/ac	October	Fall	35	0		37	76	117	72	76	117	N/A
45	142.6	10	Tons/ac	October	Fall	37	0		41	84	130	78	84	130	N/A
46	317.1	9	Tons/ac	October	Fall	33	0		37	76	117	70	76	117	N/A
58	44.7	31,600	Gal/ac	July	Summer	36	0		36	16	190	72	16	190	N/A
59	44.5		Tons/ac			72	0					72	0		N/A
60	75.9	31,600	Gal/ac	July	Summer	36	0		36	16	190	72	16	190	N/A
72			Tons/ac			72	0					72	0		N/A

Comments:
Manure application Estimate for 2017 Growing Season

Plan Year: 2017

Part 5: Nutrient Balance

41. Nutrient Balance						
Field #	Crop Yield, lb, bu, ton	Estimated Crop N Removal lb/ac	Estimated Crop P_2O_5 removal lb/ac	Nitrogen Balance lb/ac	*P_2O_5 Balance ppm	Legume Credit (Table 2 of EC750)
1	61	79.3	15.3	30	36	
2	61	79.3	15.3	30	26	
3	147	176.4	51.5	30	18	
4	61	79.3	15.3	30	17	
5	29	72.5	16.2	30	20	
6	75	90.0	26.3	30	19	
7	1822	91.1	20.0	30	27	
8	75	90.0	26.3	30	24	
9	75	90.0	0.0	30	26	
10	29	72.5	16.2	30	26	
11	29	72.5	16.2	30	26	
12A	29	72.5	16.2	30	19	
13	29	72.5	16.2	30	19	
14	29	72.5	16.2	31	18	
15	29	72.5	16.2	31	19	
16	75	90.0	26.3	30	44	
17	29	72.5	16.2	30	28	
18	75	90.0	26.3	30	25	
19	75	90.0	26.3	30	26	
20	75	90.0	26.3	30	31	
21	29	72.5	16.2	30	22	
22	34	51.0	13.9	30	23	
23	34	51.0	13.9	30	26	
24	34	51.0	13.9	30	40	
25	61	79.3	15.3	30	12	
26	61	79.3	15.3	30	13	
27	34	51.0	13.9	30	14	
28	1822	91.1	20.0	30	36	
29	29	72.5	16.2	30	18	
30	61	79.3	15.3	30	13	
31	61	79.3	15.3	30	13	
32	61	79.3	15.3	30	13	
33	1822	91.1	20.0	30	18	
34	1822	91.1	20.0	30	18	
35	1822	91.1	20.0	30	16	
36	61	79.3	15.3	30	29	
37	1822	91.1	20.0	30	24	
38	29	72.5	16.2	31	19	
39	1822	91.1	20.0	30	23	
40	1822	91.1	20.0	30	19	
41	75	90.0	26.3	30	25	
42	75	90.0	26.3	30	26	
43	29	72.5	16.2	30	22	
44	29	72.5	16.2	30	21	
45	2	110.0	24.0	30	17	
46	29	72.5	16.2	30	22	
12B	29	72.5	16.2	30	11	
47A	29	72.5	16.2	30	9	
47B	29	72.5	16.2	30	10	
48	29	72.5	16.2	30	5	

*(Total Land Application of P_2O_5 in lb/acre - Total Crop Removal of P_2O_5 in lb/acre)/20 + Soil P_2O_5 in PPM

Section D: Application Site Summary & Best Management Practices

Application Site Summary & Best Management Practices

Wulf Cattle Depot

Field Id Area	Useable Acreage(Acres)	Land Use	Quarter	S	T	R	Owner of Land	Easements	*Nitrogen Risk Assessment	#Runoff Setbacks	Application Rate Limitations	^Best Management Practices
1	64.0	Cropland	NW 1/4	3	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
2	89.0	Cropland	NW 1/4	3	21 N	26 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
3	103.0	Irrigated Cropland	SW 1/4	4	21 N	27 E	Sharon Walker	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling, and no application when ground has potential for runoff
4	208.0	Cropland	E 1/2	5	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
5	55.5	Cropland	SW 1/4	5	21 N	27 E	Sharon Walker	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
6	119.9	Cropland	SE 1/4	5	21 N	27 E	Sharon Walker	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
7	122.9	Cropland	NW 1/4	6	21 N	27 E	Bonnie Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
8	60.2	Cropland	SE 1/4	6	21 N	27 E	Dallas & Dee Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
9	279.4	Cropland	W 1/2	7	21 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
10	139.8	Cropland	NW 1/4	8	21 N	27 E	Dallas & Dee Schott	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
11	145.7	Cropland	NE 1/4	8	21 N	27E	Dallas & Dee Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
12A	80.9	Cropland	NE 1/4	9	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
13	87.0	Cropland	SW 1/4	9	21 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
14	132.0	Cropland	NE 1/4	9	22 N	27 E	Dallas & Dee Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
15	133.0	Cropland	SE 1/4	9	22 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
16	315.0	Cropland	E 1/2	10	22 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
17	149.0	Cropland	SE 1/4	13	21 N	26 E	Bonnie Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
18	176.7	Cropland	N 1/2	15	22 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
19	143.0	Cropland	N 1/2	15	22 N	27 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
20	288.5	Cropland	E 1/2	16	22 N	27 E	Dallas & Dee Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
21	131.5	Cropland	N 1/2	19	22 N	27 E	Gary Rau	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
22	109.3	Cropland	E 1/2	30	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
23	89.3	Cropland	NE 1/4	31	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
24	57.4	Cropland	SE 1/4	31	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
25	149.4	Cropland	S 1/2	34	22 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling

Field Id Area	Useable Acreage(Acres)	Land Use	Quarter	S	T	R	Owner of Land	Easements	*Nitrogen Risk Assessment	#Runoff Setbacks	Application Rate Limitations	^Best Management Practices
26	150.0	Cropland	S 1/2	34	22 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
27	148.1	Cropland	NW 1/4	34	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
28	99.2	Cropland	NE 1/4	34	22 N	27 E	Gary Rau	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
29	229.4	Cropland	N 1/2	4	20 N	25 E	Dallas & Dee Schott	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
30	150.0	Cropland	NW 1/4	4	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
31	64.1	Cropland	N 1/2	4	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
32	65.1	Cropland	NE 1/4	4	21 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
33	158.3	Cropland	N 1/2	7	21 N	26 E	Golden Hills LLP	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
34	38.0	Cropland	NE 1/4	7	21 N	26 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
35	317.7	Cropland	W 1/2,	10	21 N	25 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
36	153.0	Cropland	SE 1/4	10	21 N	25 E	Golden Hills LLP	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
37	157.0	Cropland	S 1/2	11	21 N	25 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
38	67.0	Cropland	W 1/2	12	21 N	25 E	Golden Hills LLP	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
39	251.1	Cropland	E 1/2	14	21 N	25 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
40	156.5	Cropland	NE 1/4	23	21 N	25 E	Dallas & Dee Schott	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
41	85.1	Cropland	SE 1/4	24	21 N	26 E	Bonnie Schott	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
42	73.7	Cropland	SE 1/4	24	21 N	26E	Bonnie Schott	Yes	High	No	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
43	309.5	Cropland	W 1/2	26	21 N	25 E	Dallas & Dee Schott	Yes	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
44	307.9	Cropland	S 1/2	32	21 N	25 E	Dallas & Dee Schott	Yes	High	Yes	Crop N Removal	Delay Fall manure applications until soil temperatures drop below 50 degrees F, No Till, Soil Test prior to application of nitrogen, manure sampling
45	142.6	Cropland	NE 1/4	32	22 N	26 E	Wulf Cattle	Owned	Low	Yes	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
46	317.1	Cropland	W 1/2	35	21 N	25 E	Dallas & Dee Schott	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
12B	44.7	Irrigated Cropland	NE 1/4	9	21 N	27 E	Dallas & Dee Schott	Yes	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
47A	44.5	Cropland	NW 1/4	9	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
47B	75.9	Irrigated Cropland	NW 1/4	9	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
48	277.4	Cropland	E 1/2	16	21 N	27 E	Wulf Cattle	Owned	Low	No	Crop N Removal	No Till, Soil Test prior to application of nitrogen, manure sampling
Total Land	**7,312.3**											

*Using SD bulletin no SD 190-7-1 for groundwater leaching. Assessments based on a soils "Saturated hydraulic conductivity" Soil maps units that have a Ksat value of 10 micrometers/sec or greater will be considered to have a high leaching risk."
As shown on the Water Quality Risk Assessment map 100' setback distances will practiced.
^Best mangagement practices are shown in section O

Section E: Inventory of Water Wells

Inventory of Water Wells

Field ID	Location (Legal)	Well Depth (Ft.)	Use of Well 1/	Required Setback Distance From Well For Manure Application (Ft.)	
				County Rule	State Rule
5	NW/4 of SE/4, Sec 5, T 21N, R 27 E	115	Private	NA	250
6	SW/4 of NE/4, Sec 5 T 21 N, R 27 E	125	Producer Owned	NA	150
7	NW/4 of NW/4, Sec 6, T 21 N, R 27 E	116	Private	NA	250
Near 14	SE/4 of NW/4, Sec 22, T 22N, R 27 E	220	Private	NA	250
37	NE/4 of SE/4, Sec 11 T 21N, R 25 E	180	Private	NA	250

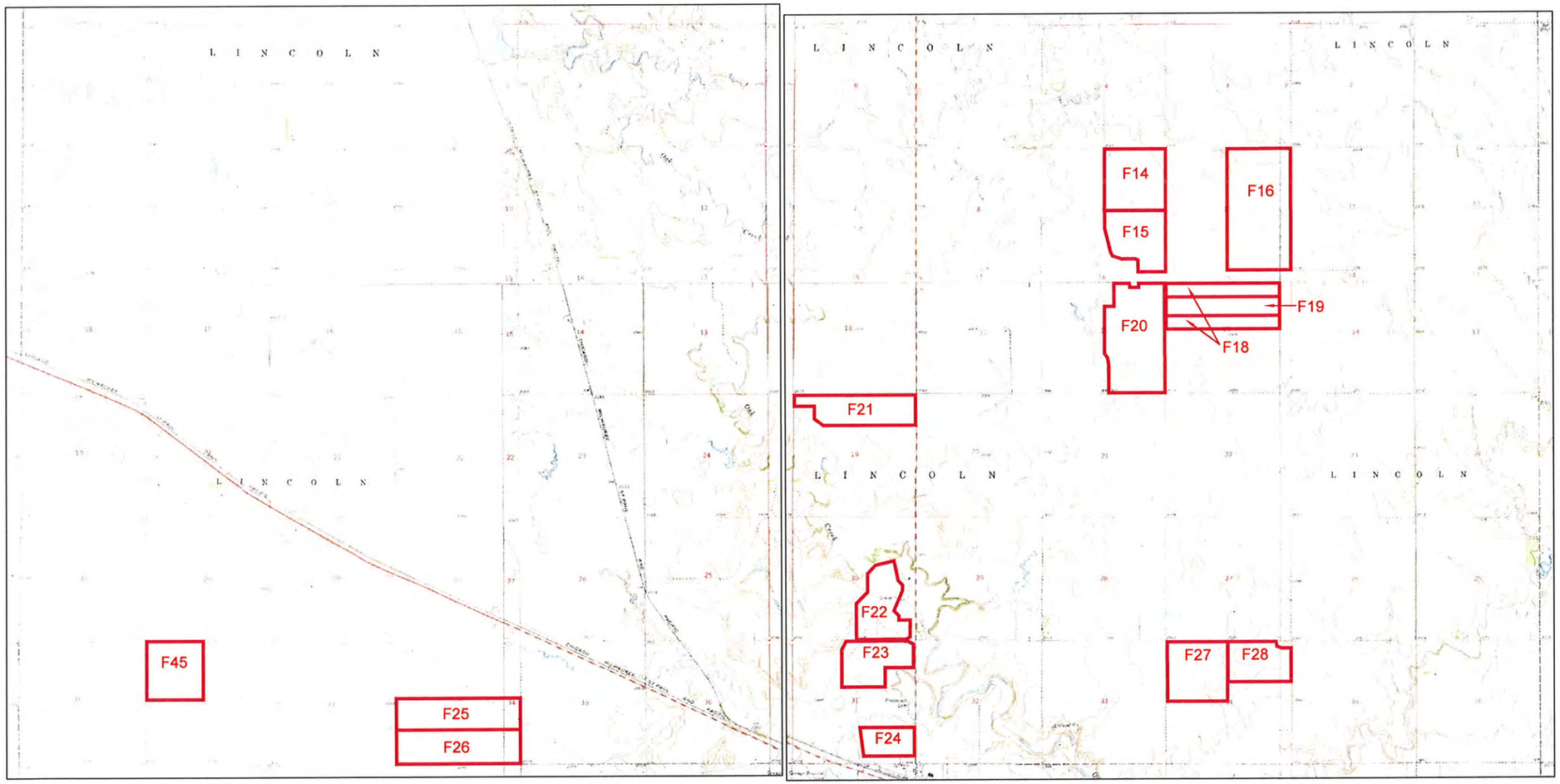
1/ Well Use Categories:

- Producer (Owned)
- Private
- Public
- Irrigation

Section F: Field Maps

22N – 26E

22N – 27E



GENERAL NOTES

No.	Revision/Issue	Date

DeHaan, Grabs & Associates, LLC
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www.dgaengineering.com

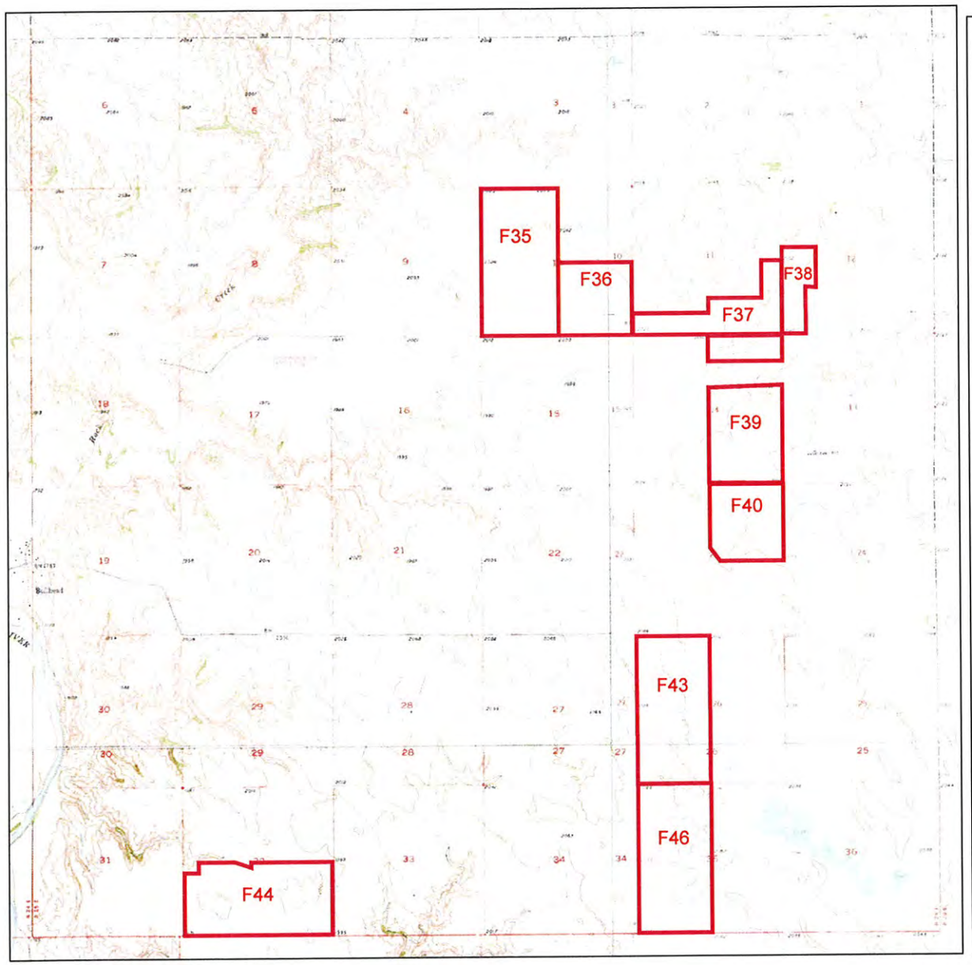
WULF CATTLE DEPOT

NW 1/4 SECTION 19, T 24 N, R 2 W
MADISON COUNTY, NE

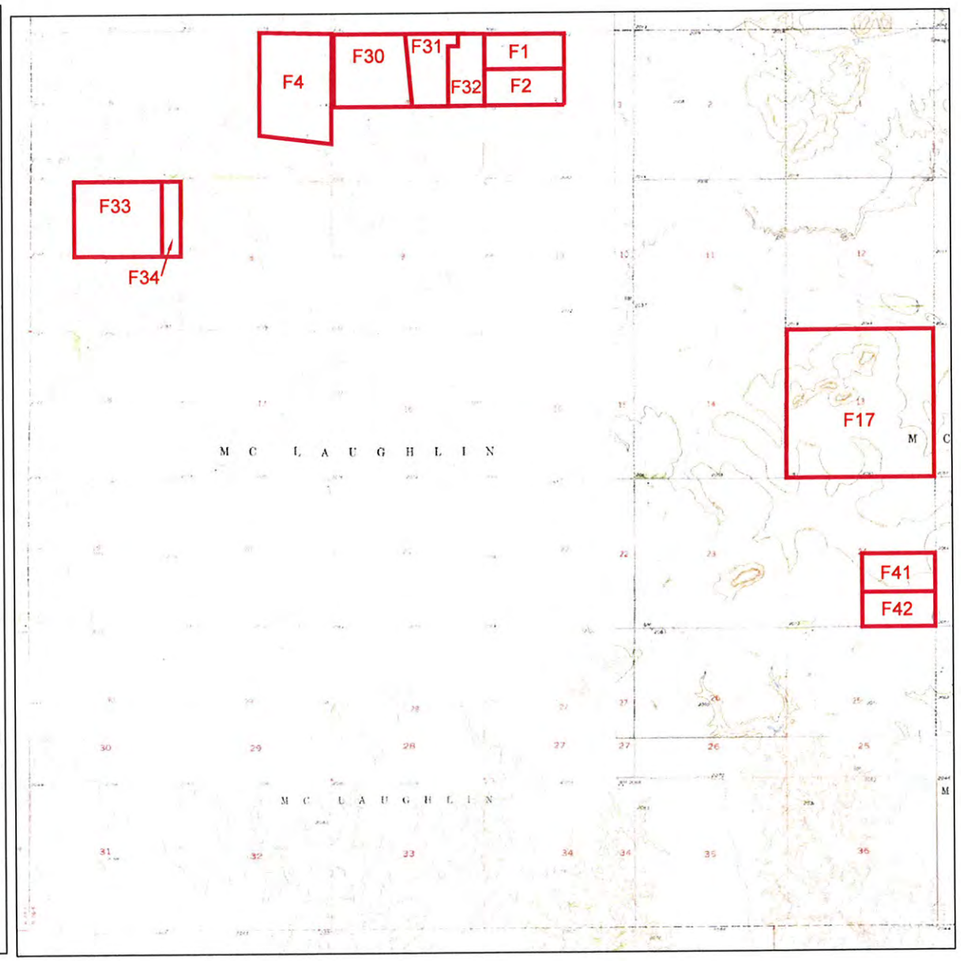
OVERALL LAND APPLICATION MAP

DATE: JAN 12, 2012	SHEET: 1
SCALE: NONE	
DRAWN BY: CAS	
CHECKED BY: GGG	

21N – 25E



21N – 26E



GENERAL NOTES

No.	Revision/Issue	Date

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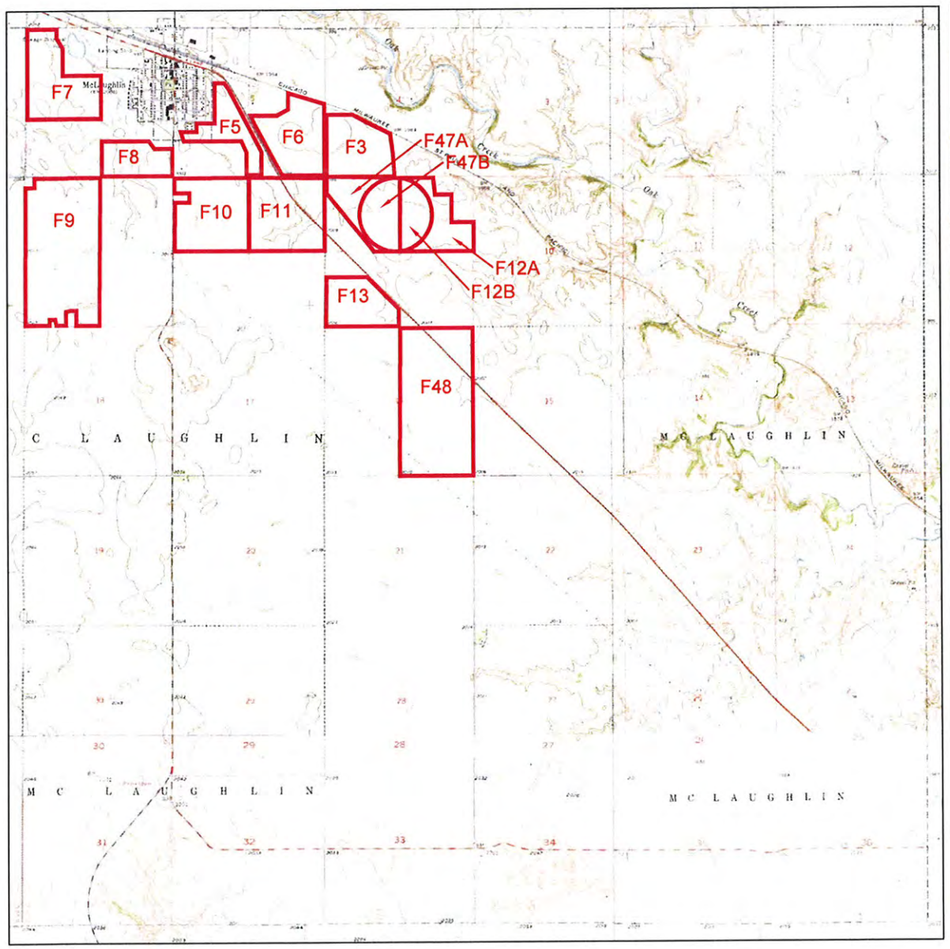
WULF CATTLE DEPOT

NW 1/4 SECTION 19, T 24 N, R 2 W
MADISON COUNTY, NE

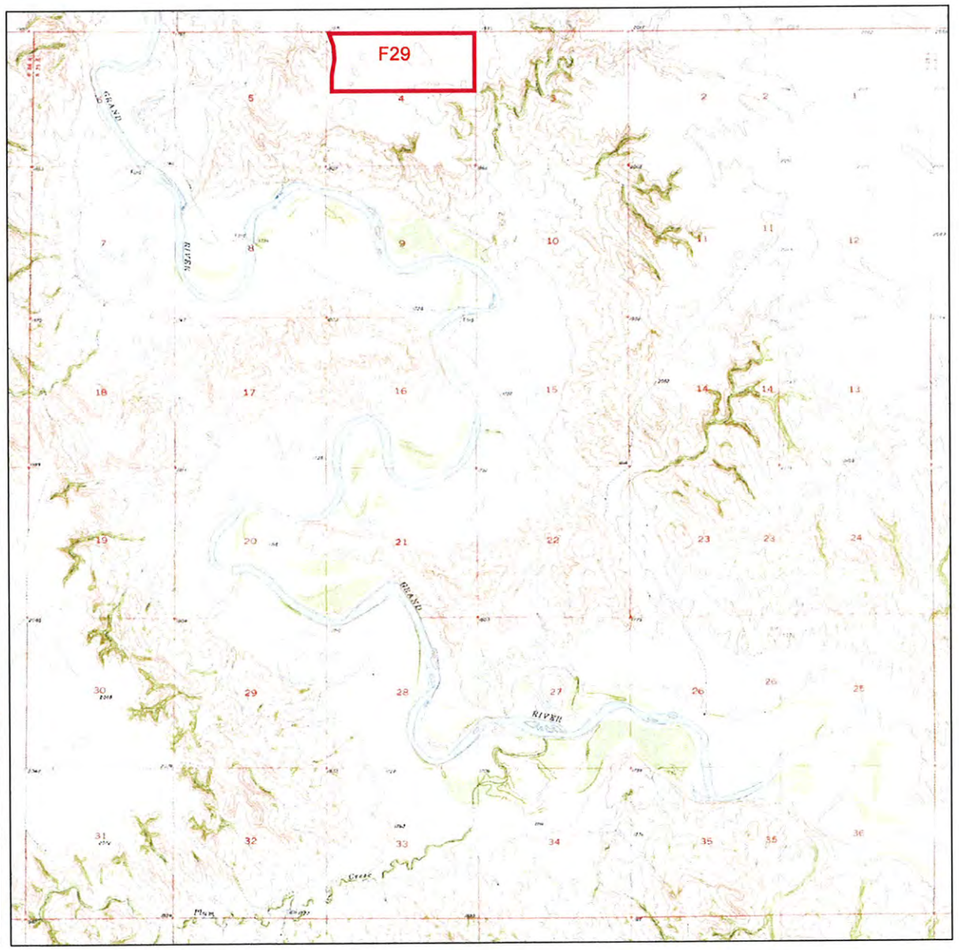
OVERALL LAND APPLICATION MAP

DATE: JAN 12, 2012	SHEET: 2
SCALE: NONE	
DRAWN BY: CAS	
CHECKED BY: GGG	

21N – 27E



20N – 25E



GENERAL NOTES

No.	Revision/Issue	Date
1	Field Addition	5/23/13

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WULF CATTLE DEPOT

NW 1/4 SECTION 19, T 24 N, R 2 W
MADISON COUNTY, NE

OVERALL LAND APPLICATION MAP

DATE: JAN 12, 2012	SHEET: 3
SCALE: NONE	
DRAWN BY: CAS	
CHECKED BY: GGG	

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

Legal Description: 3-21-26

Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

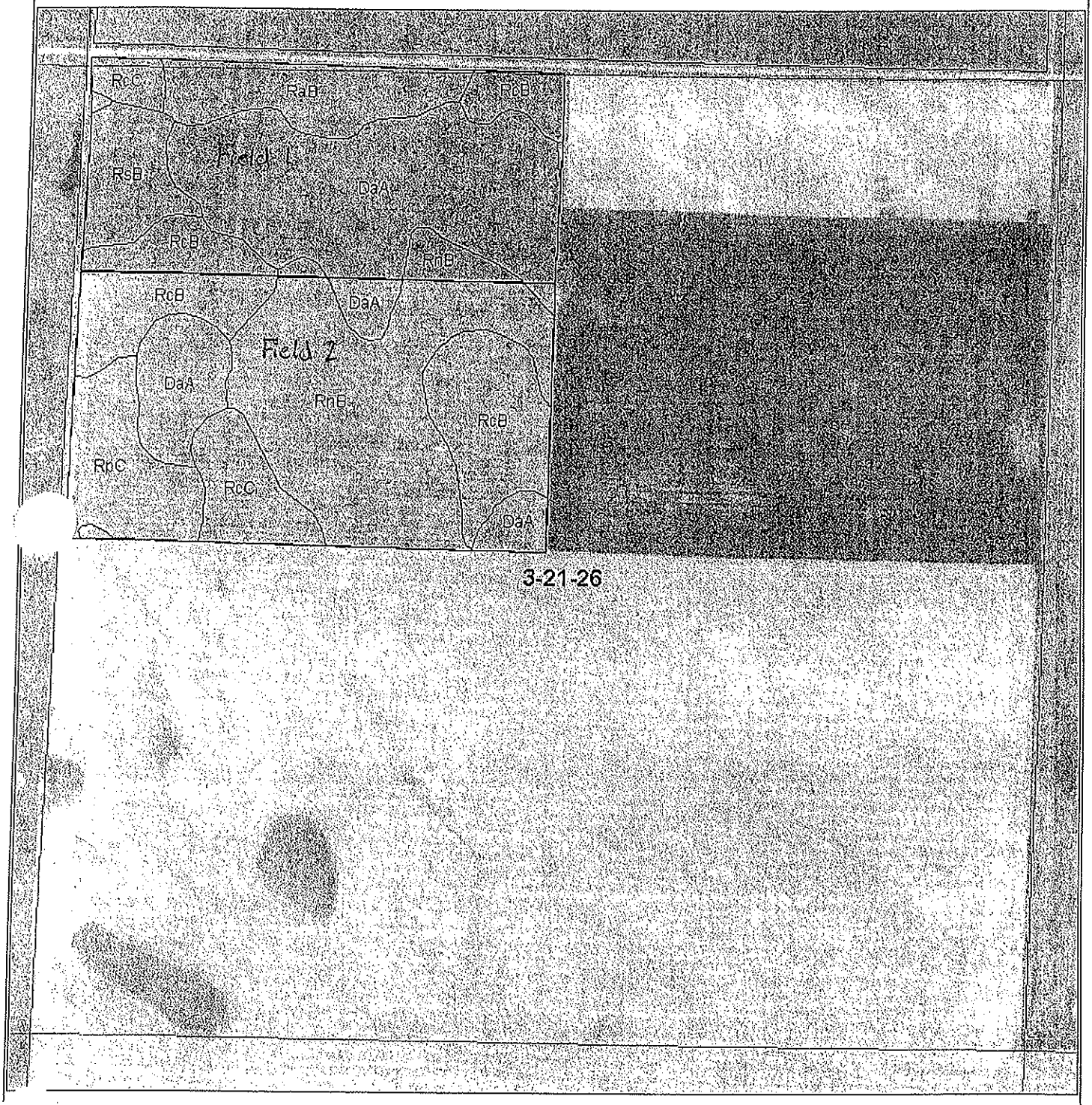
500 0 500 1,000 1,500 2,000 Feet

Soils Map

,tomer(s): DALLAS SCHOTT

Legal Description: 3-21-26

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- Soils Map
- CNMP_2010
- Sections

440 0 440 880 1,320 1,760 Feet

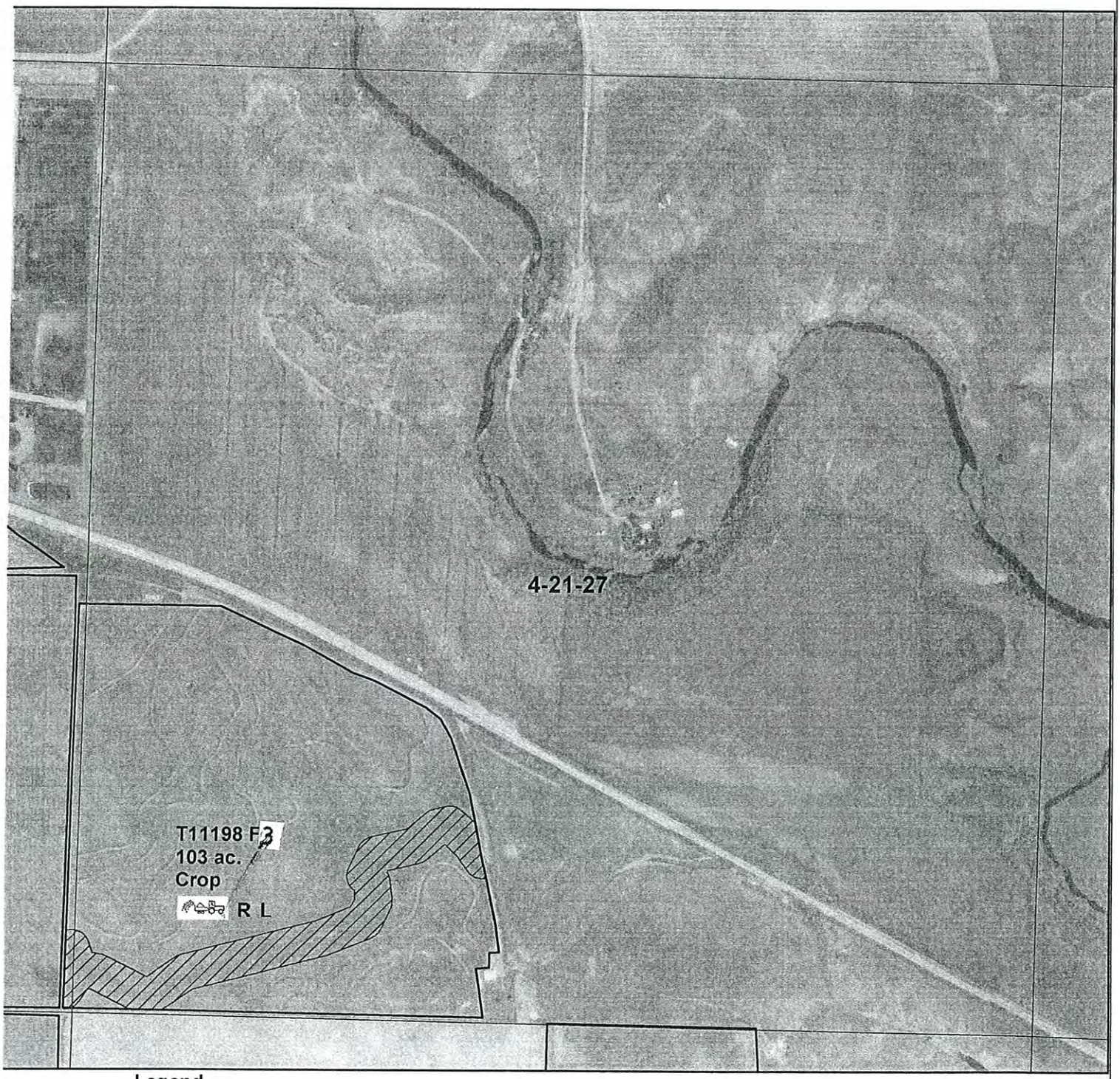
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

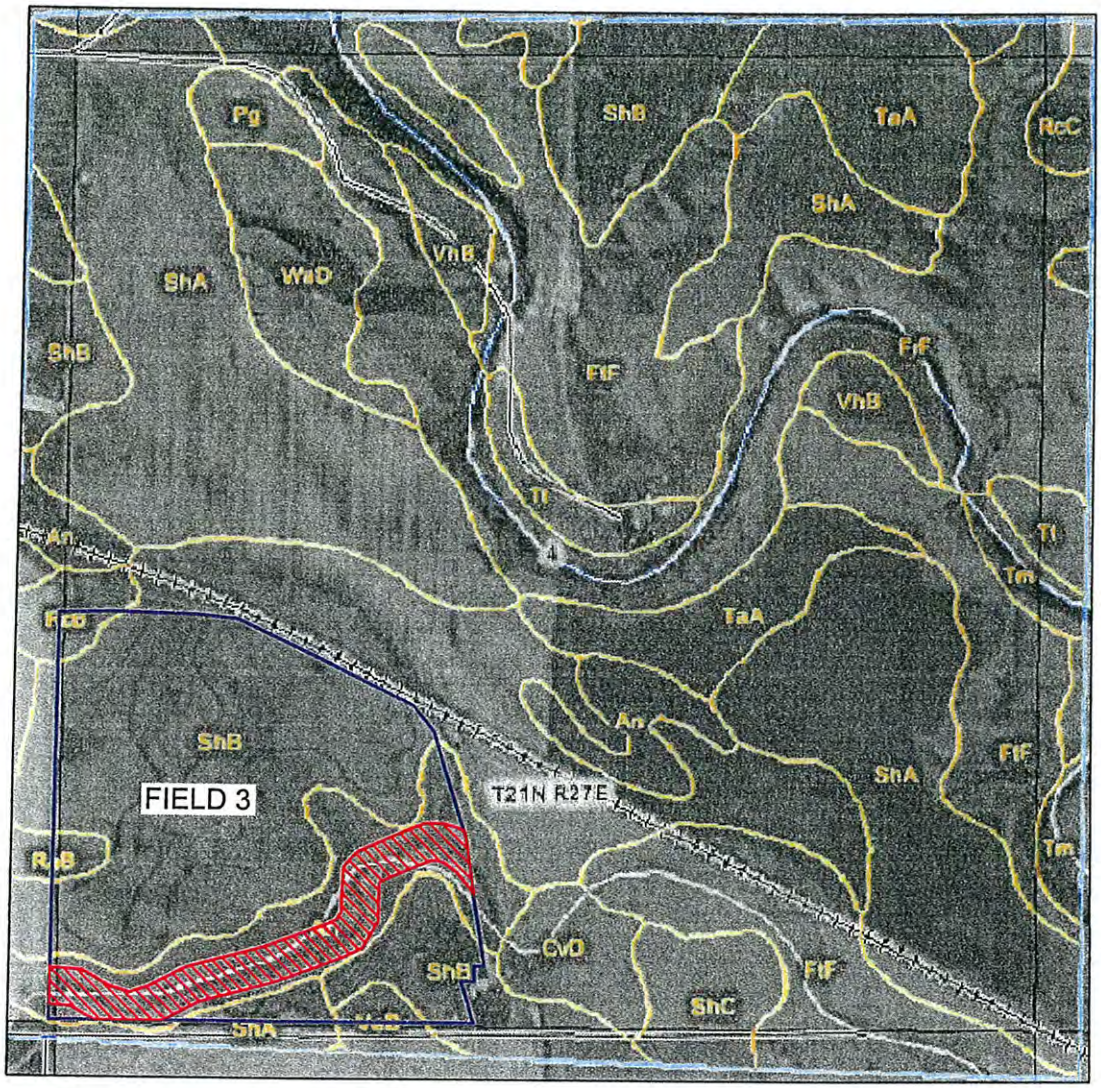
Legal Description: 4-21-27



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

580 0 580 1,160 1,740 2,320 Feet



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
Pg Pits, gravel
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
ShC Shambo loam, 6 to 9 percent slopes
TaA Tally fine sandy loam, 0 to 6 percent slopes
Tm Trembles fine sandy loam, channeled
Tt Trembles fine sandy loam, terrace
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes
WaD Wabek gravelly sandy loam, 2 to 35 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

4 - 21N - 27E
CORSON COUNTY, SD

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	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 5-21-26

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

470 0 470 940 1,410 1,880 Feet

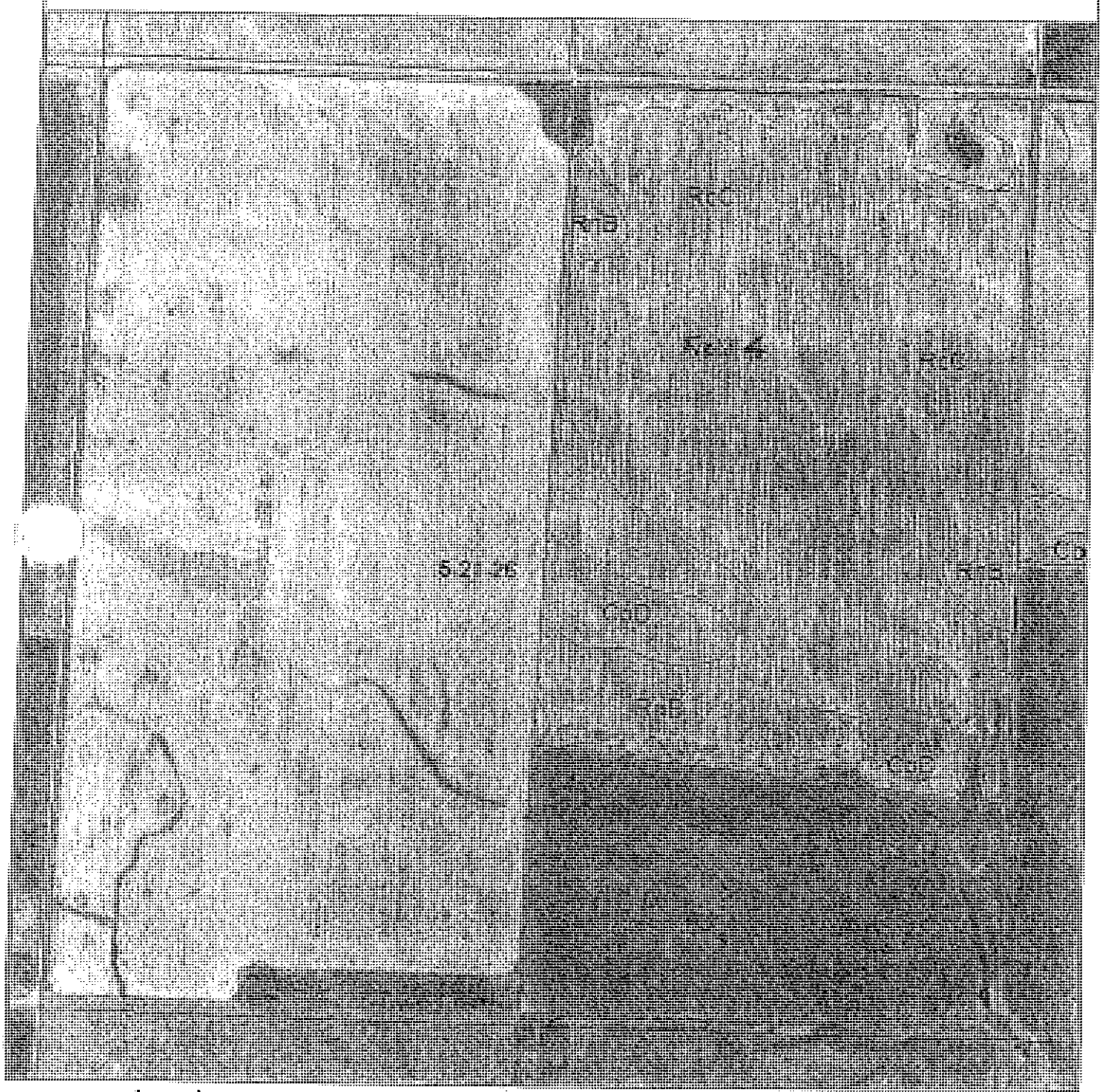
Soils Map

Farmer(s): DALLAS SCHOTT

Legal Description: S-21-2E

Field Office: Mitchell - ANMT

Agency: USDA - NRCS



Legend

- Soils Map
- CNMP
- Sections

400 0 800 1,600 2,400 Feet

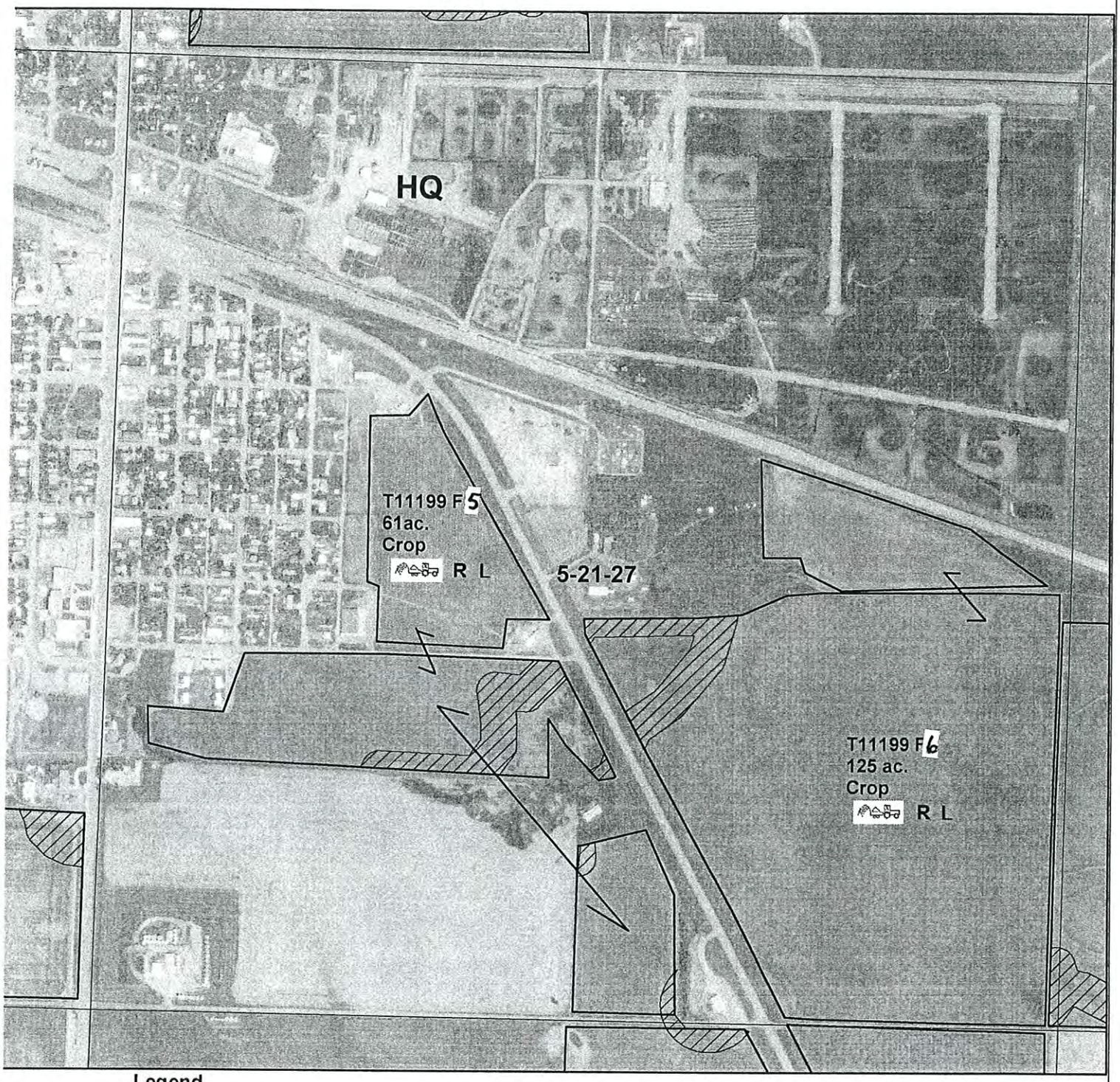
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 5-21-27

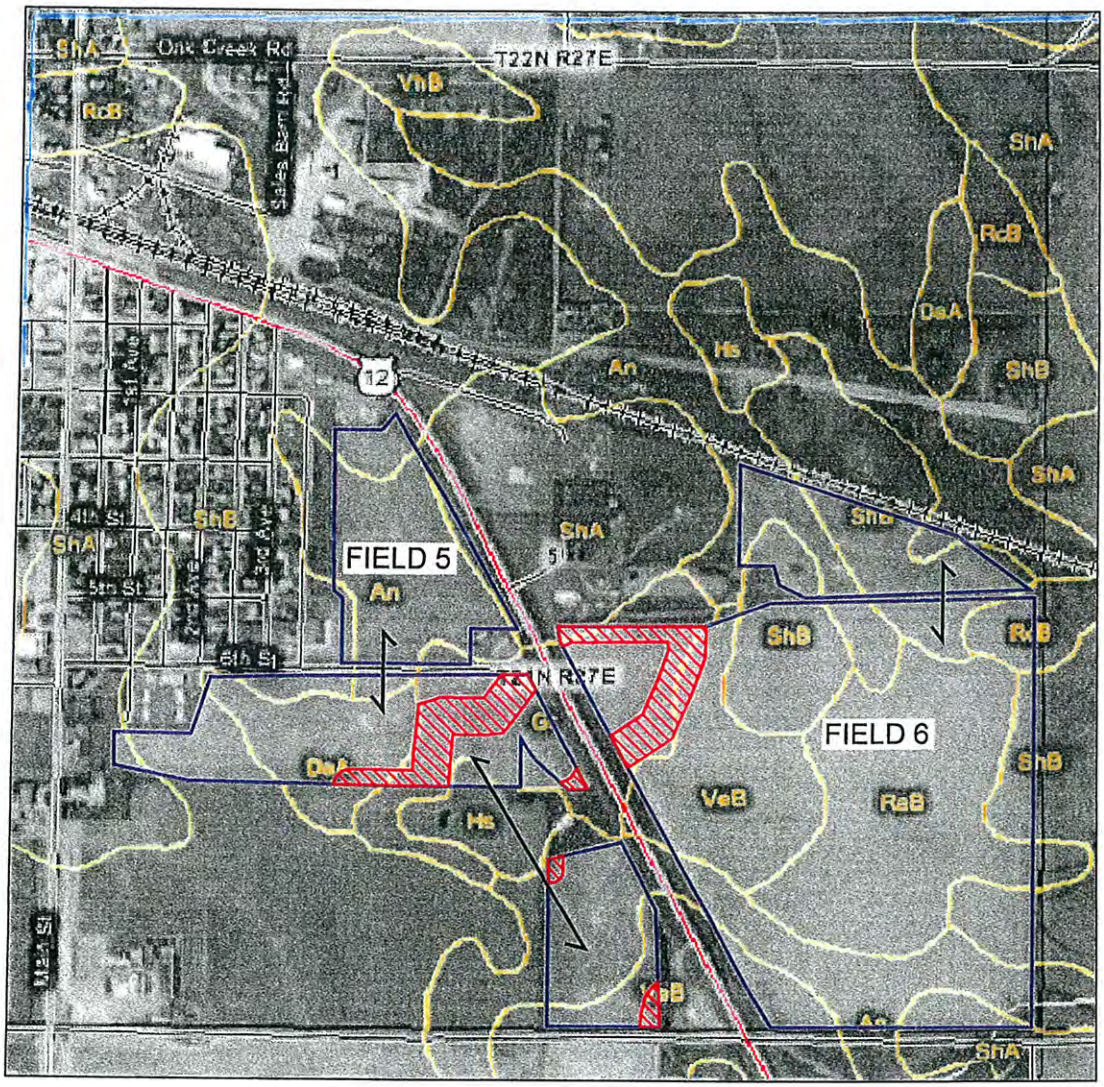
Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

560 0 560 1,120 1,680 2,240 Feet



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
DaA Daglum loam, 0 to 3 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

5 - 21N - 27E
CORSON COUNTY, SD

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Consulting Engineers

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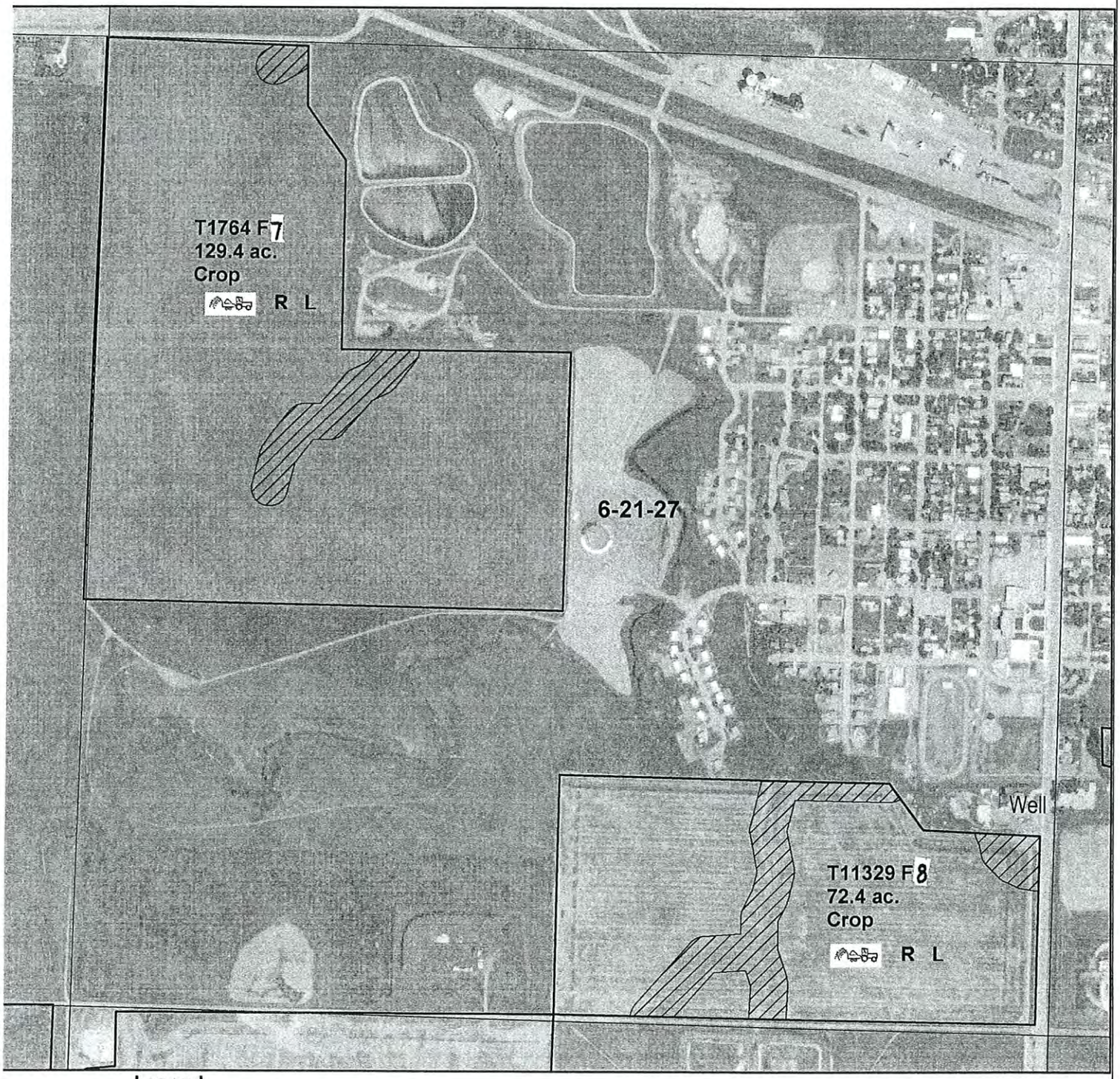
		Revision
Date:	12/28/11	Date:
Scale:	1" = 1000'	Scale:
Drawn By:	CAS	Drawn By:
Checked By:	GGG	Checked By:
Page:		Page:

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 6-21-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

560 0 560 1,120 1,680 2,240 Feet

Soils Map

Customer(s): DALLAS SCHOTT

Legal Description: 6-21-27

Field Office: Mitchell - ANMT

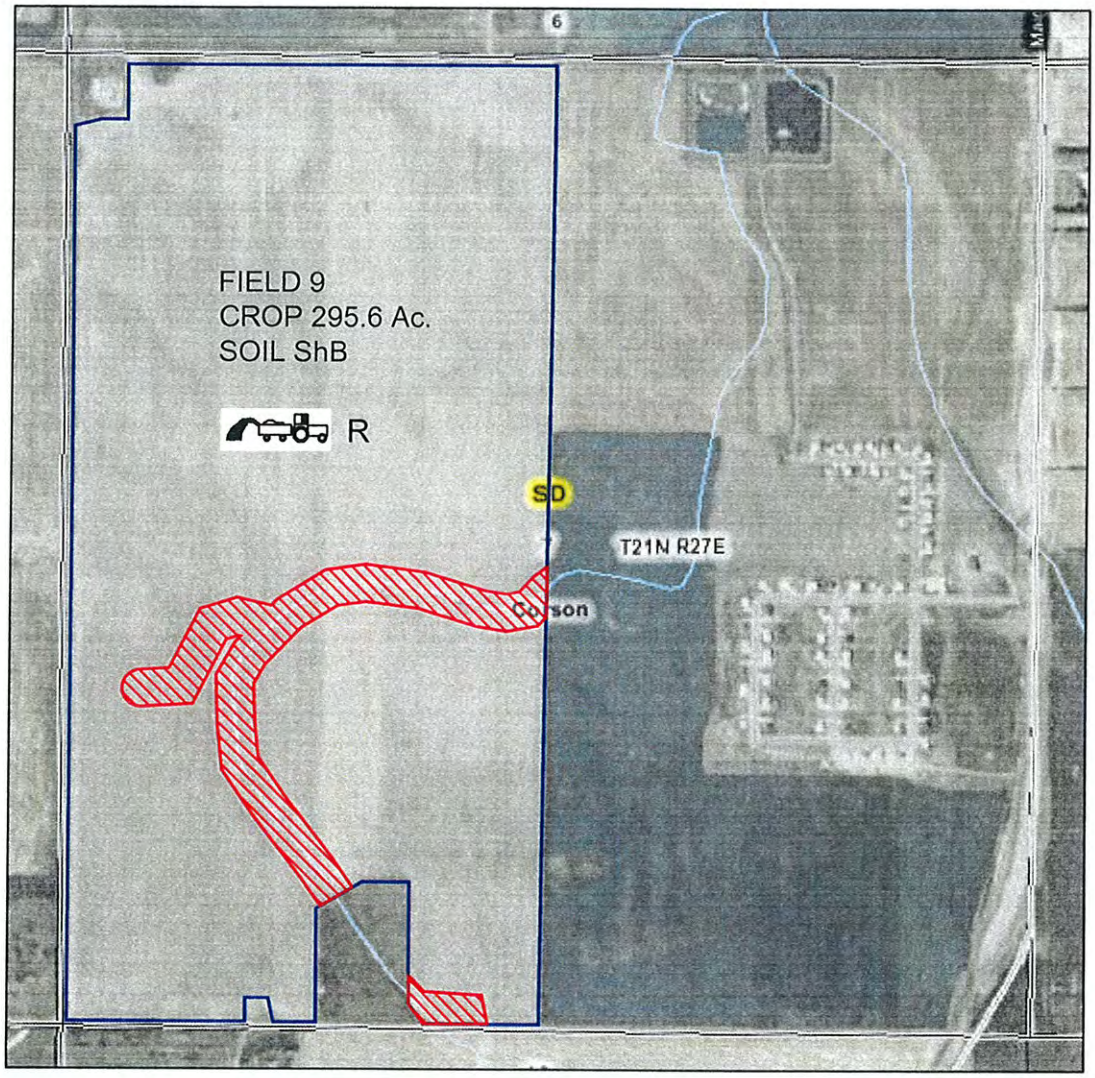
Agency: USDA - NRCS

Legend

- Soils Map
- CAMP
- Sections

0 500 1,000 2,000 Feet

N



SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

7 - 21N - 27E
CORSON COUNTY, SD

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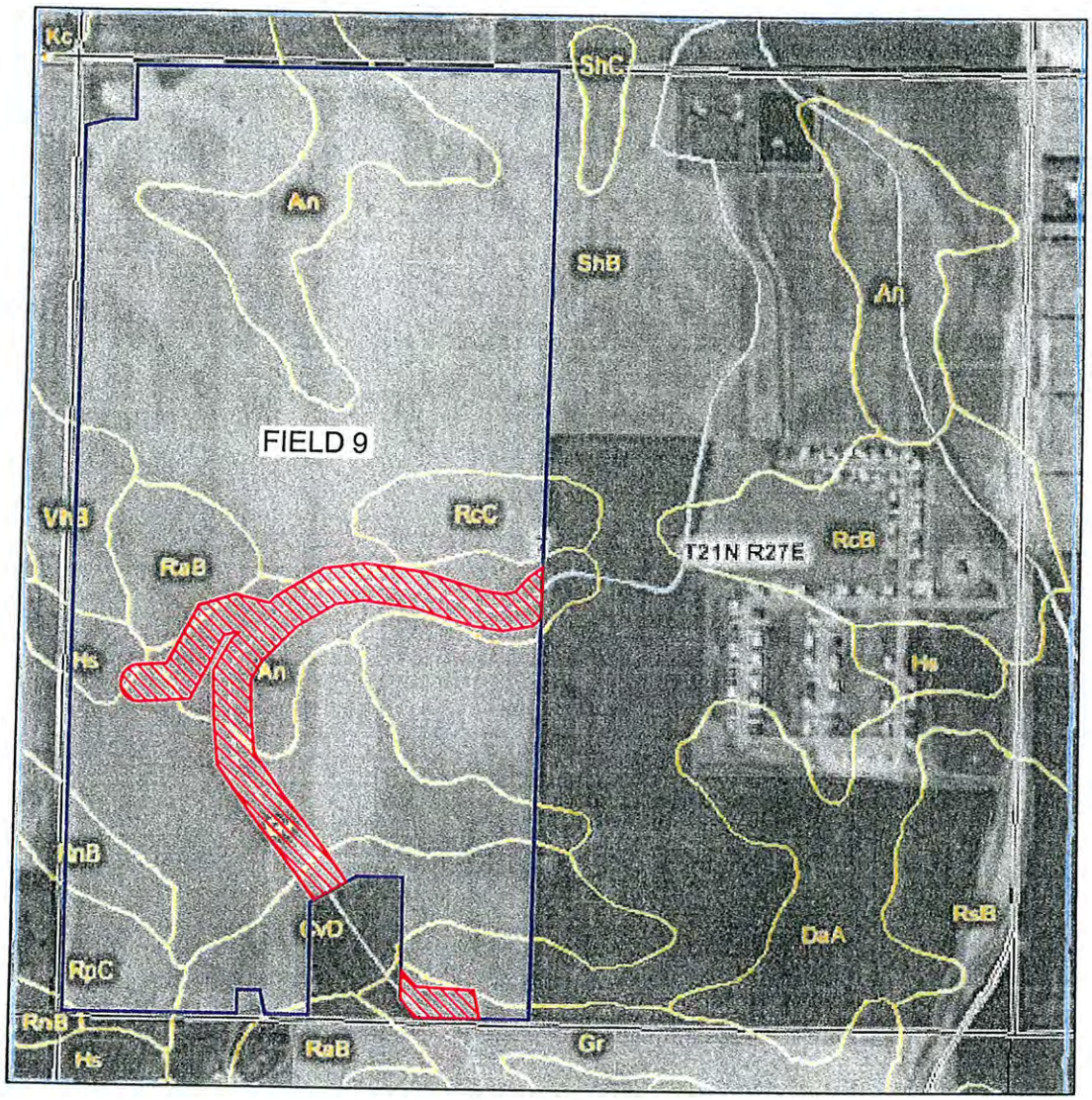
		Revision
Date:	12/28/11	Date:
Scale:	1" = 1000'	Scale:
Drawn By:	CAS	Drawn By:
Checked By:	GGG	Checked By:
Page:		Page:



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CaF Cabba-Amor loams, 15 to 60 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
Kc Korchea loam, channeled
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgA Savage silt loam, 0 to 3 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
ShC Shambo loam, 6 to 9 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

7 - 21N - 27E
CORSON COUNTY, SD

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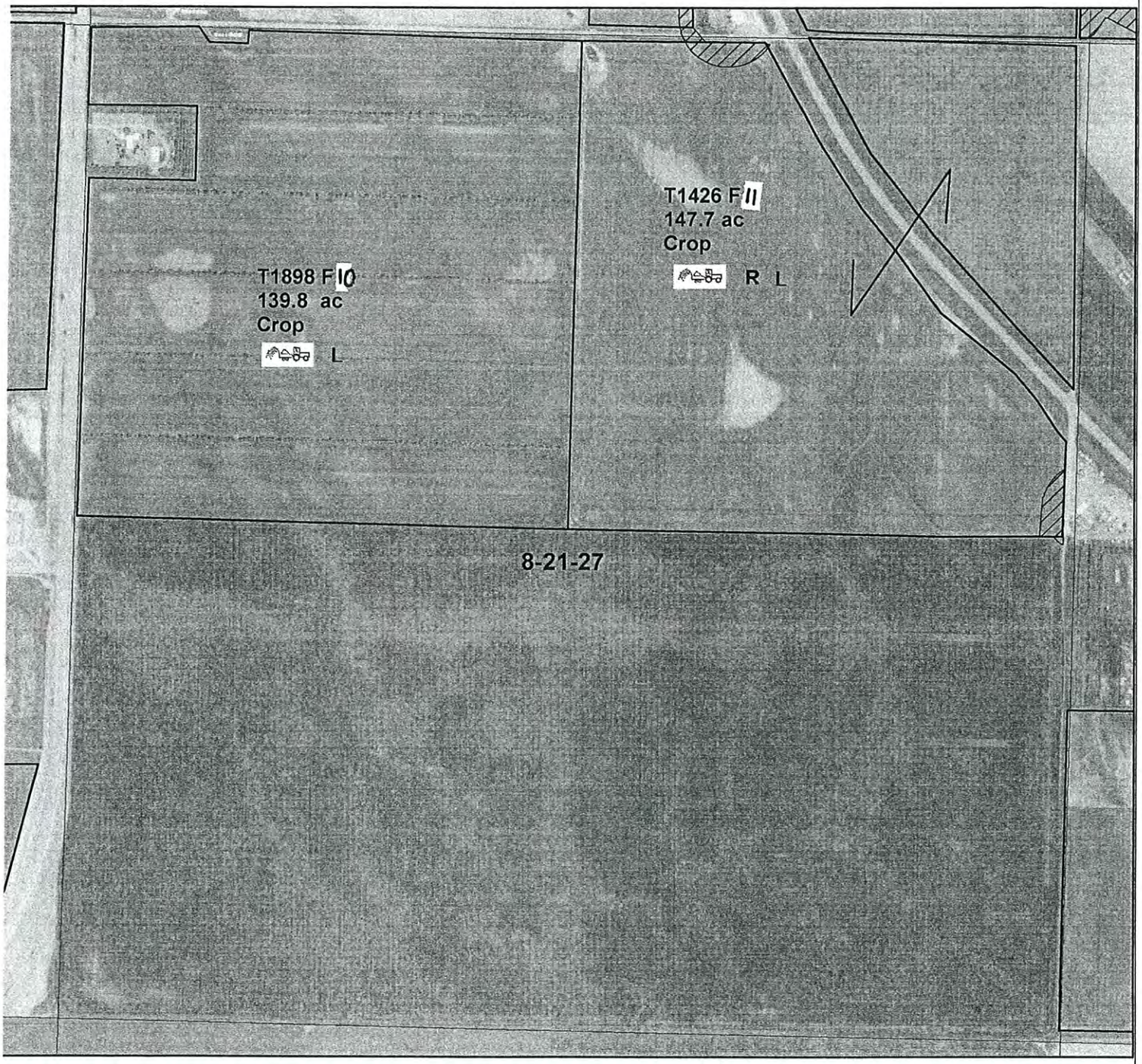
		Revision
Date:	12/28/11	Date:
Scale:	1" = 1000'	Scale:
Drawn By:	CAS	Drawn By:
Checked By:	GGG	Checked By:
Page:		Page:

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 8-21-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

570 0 570 1,140 1,710 2,280 Feet

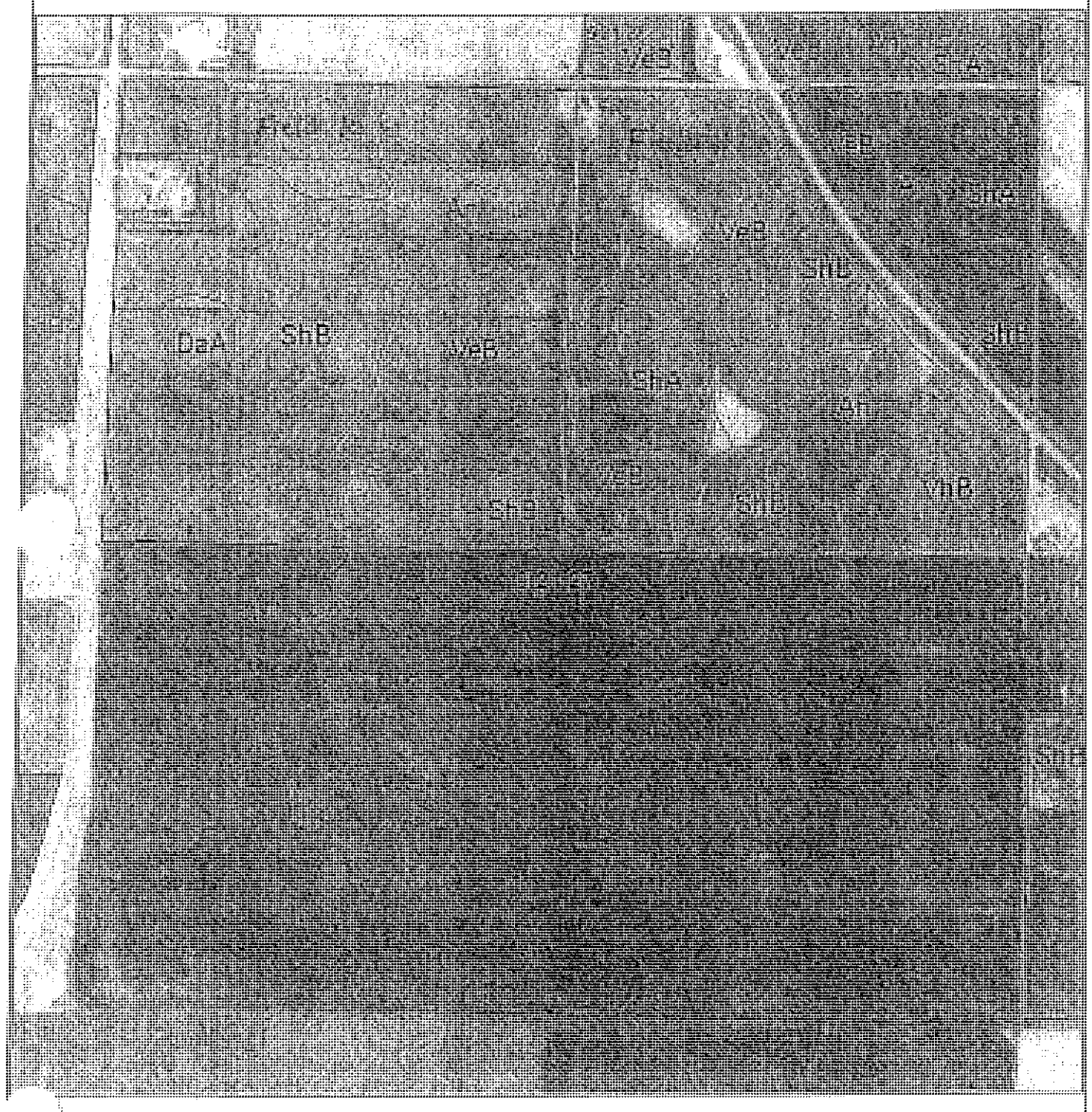
Soils Map

Farmer(s): DALLAS SCHOTT

Legal Description: 8 21 -2E

Field Office: Mitchell - MMIT

Agency: USDA - NRCS

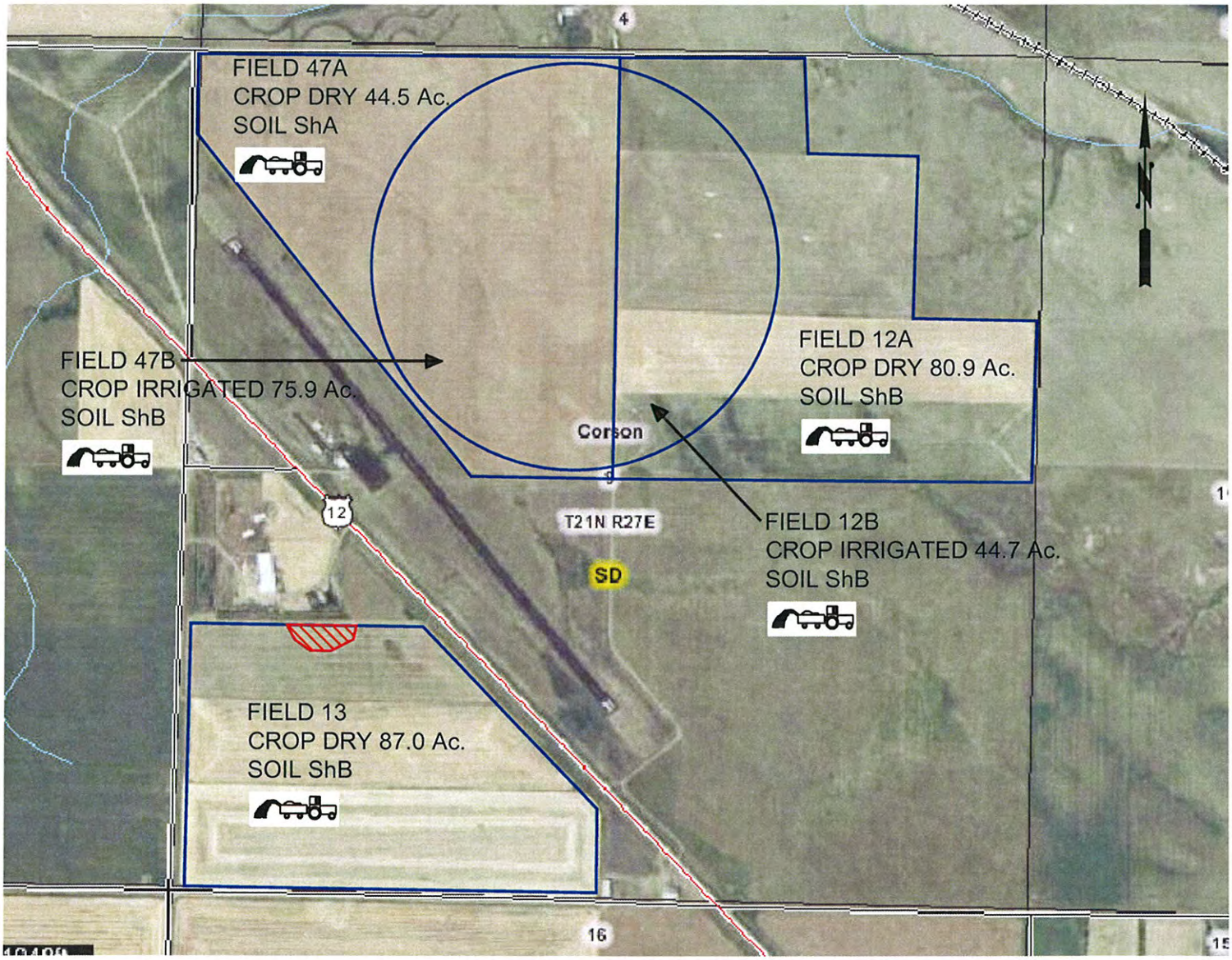


Legend

- Soils Map
- CNMP_2010

0 554 1,108 2,216 Feet

N



SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

9 - 21N - 27E
CORSON COUNTY, SD

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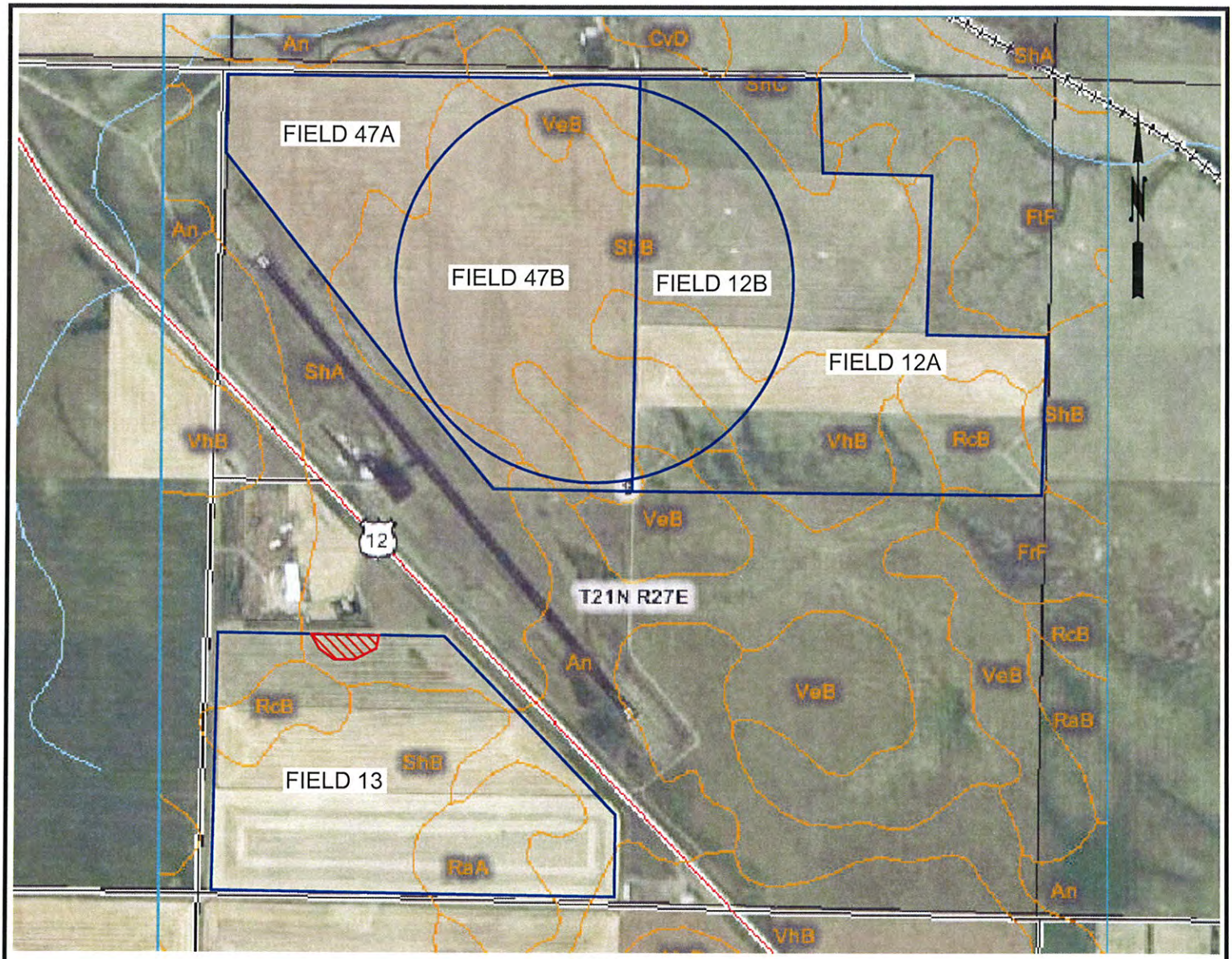
		Revision	
Date:	12/28/11	Date:	5/23/13
Scale:	1" = 1000'	Scale:	1" = 1000'
Drawn By:	CAS	Drawn By:	CAS
Checked By:	GGG	Checked By:	GGG
Page:		Page:	



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
RaA Reeder loam, 0 to 2 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
ShC Shambo loam, 6 to 9 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

9 - 21N - 27E
CORSON COUNTY, SD

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		Revision	
Date:	12/28/11	Date:	5/23/13
Scale:	1" = 1000'	Scale:	1" = 1000'
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Checked By:	GGG	Checked By:	GGG
Page:		Page:	

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 9-22-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

570 0 570 1,140 1,710 2,280 Feet

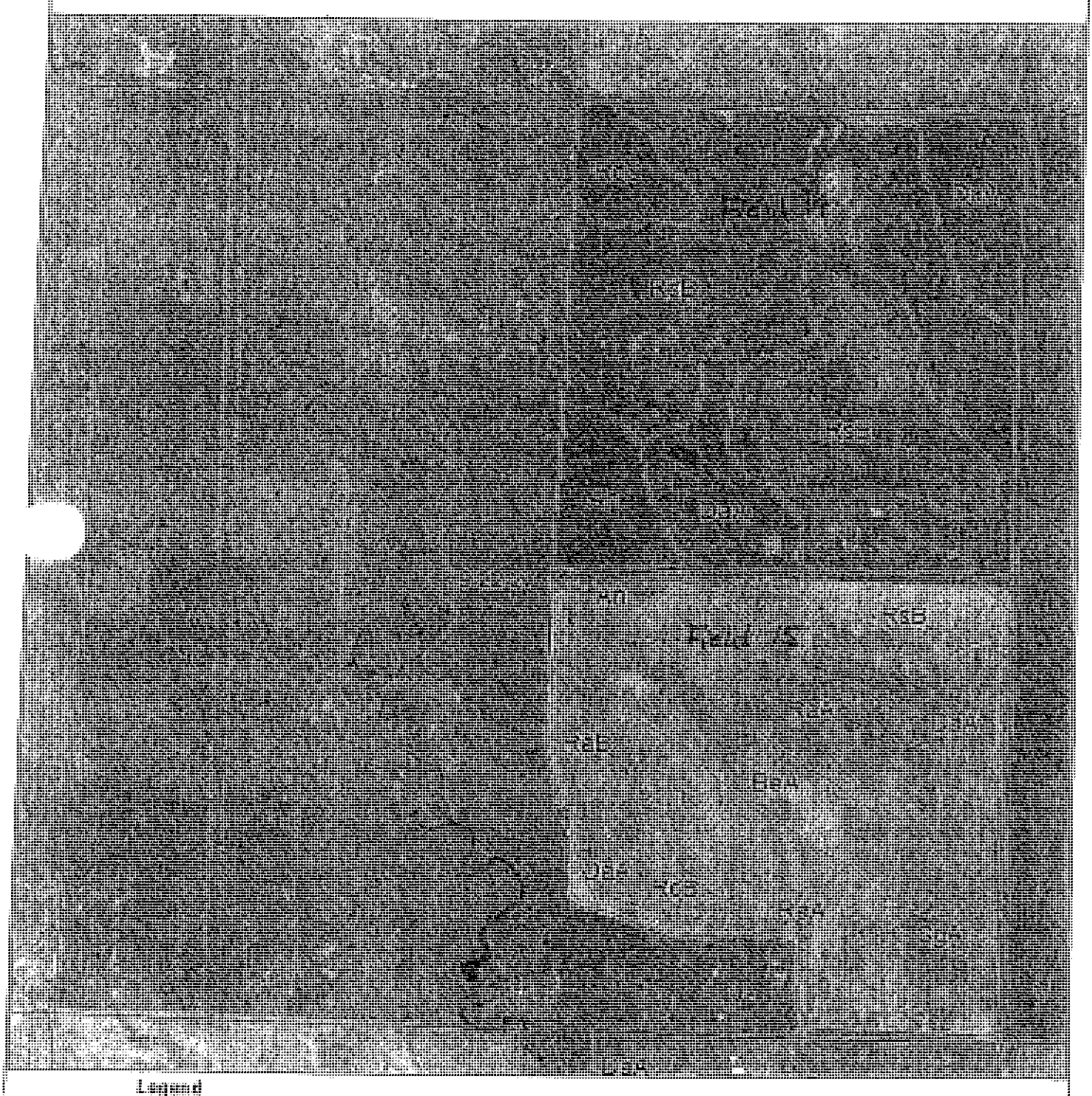
Soils Map

Owner(s): DALLAS SCHMITT

Legal Description: 9-23-37

Field Office: Mitchell - ANMT

Agency: USDA - NRCS

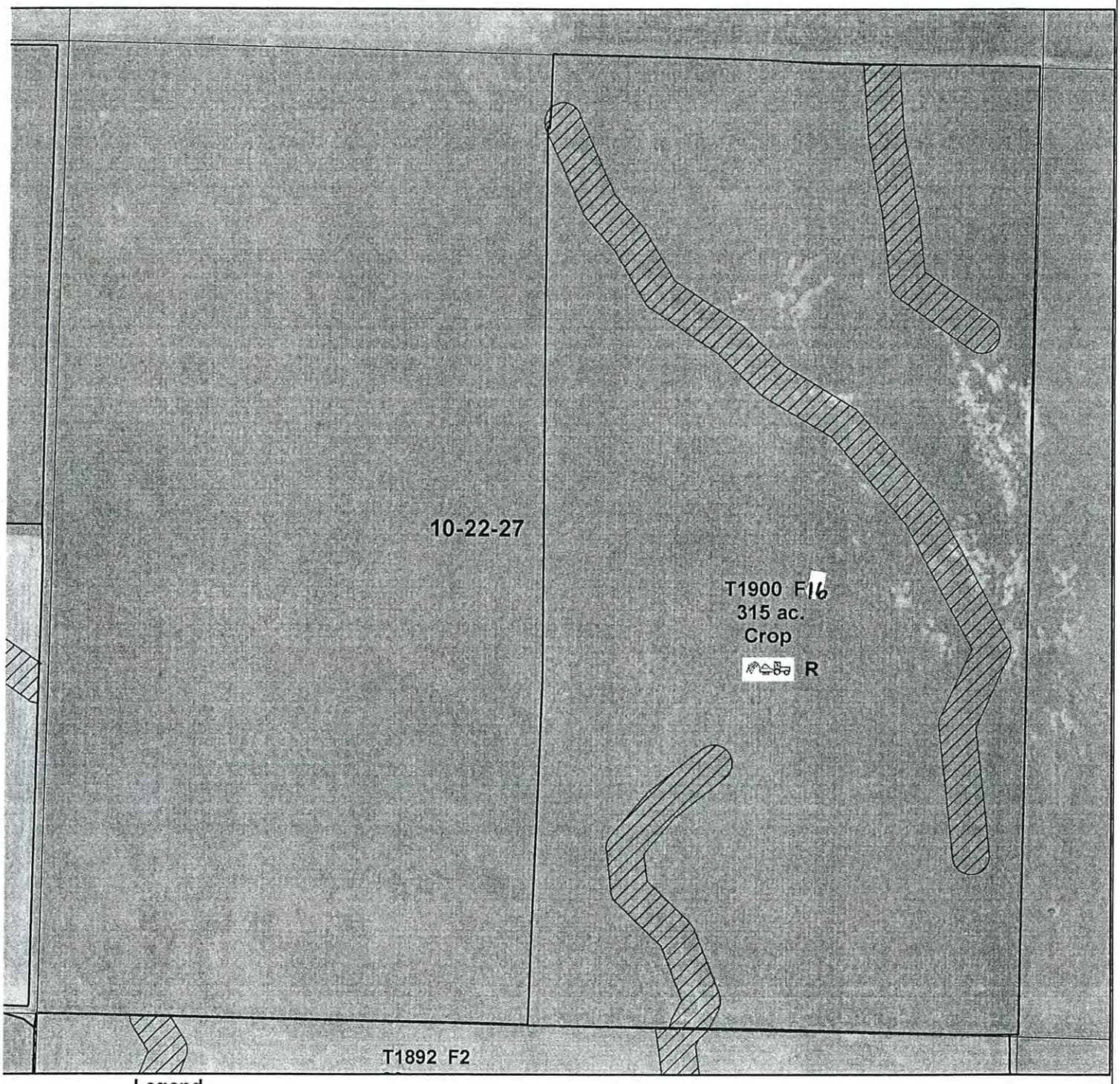


Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

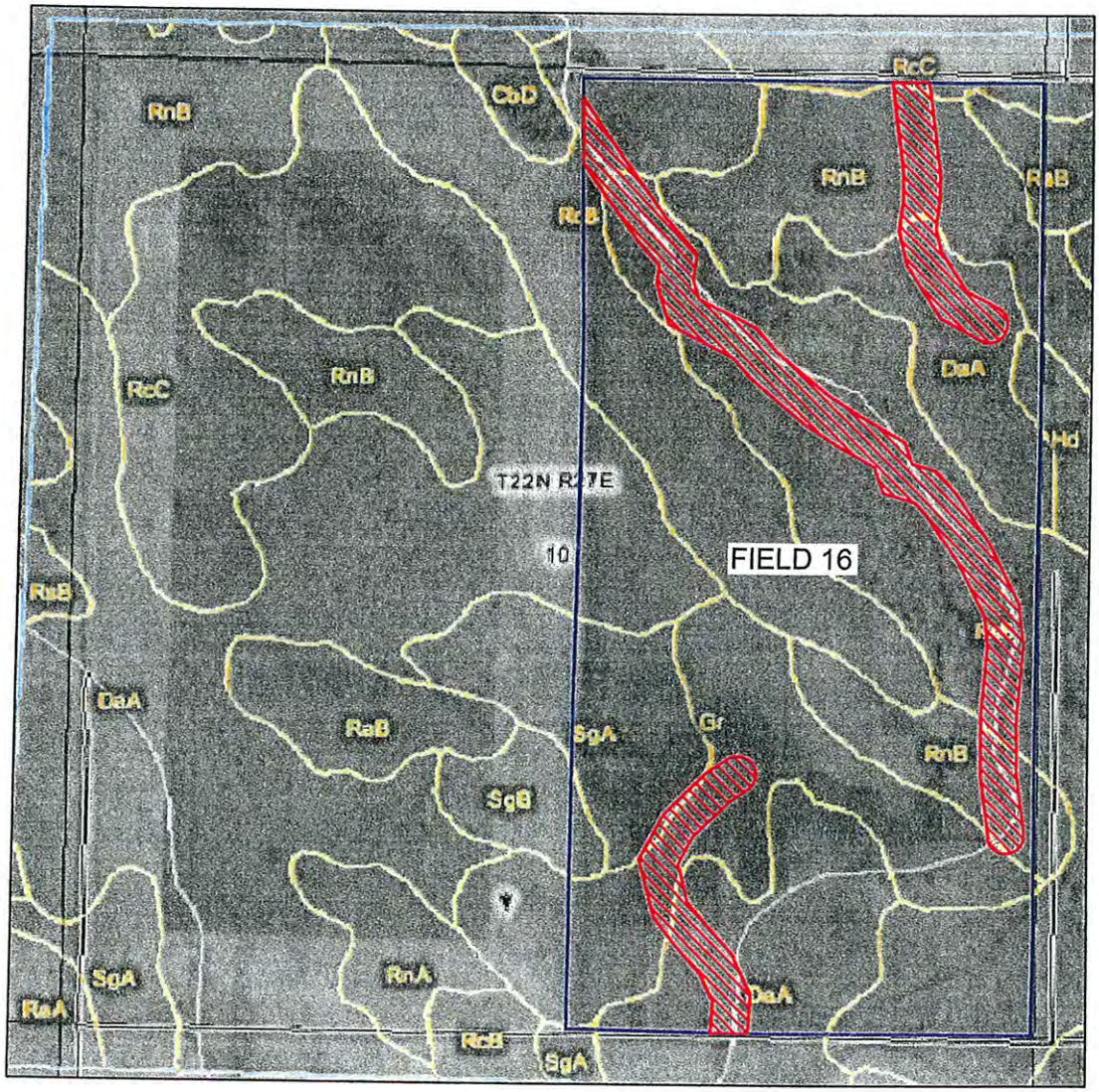
Legal Description: 10-22-27



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

570 0 570 1,140 1,710 2,280 Feet



SCALE, FEET

0 500 1000 1500 2000

Legend:

BeA Belfield-Daglum complex, 0 to 3 percent slopes
CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hd Harriet loam
RaA Reeder loam, 0 to 2 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnA Regent silty clay loam, 0 to 2 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgA Savage silt loam, 0 to 3 percent slopes
SgB Savage silt loam, 3 to 6 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

10 - 22N - 27E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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		Revision
Date:	12/28/11	Date:
Scale:	1" = 1000'	Scale:
Drawn By:	CAS	Drawn By:
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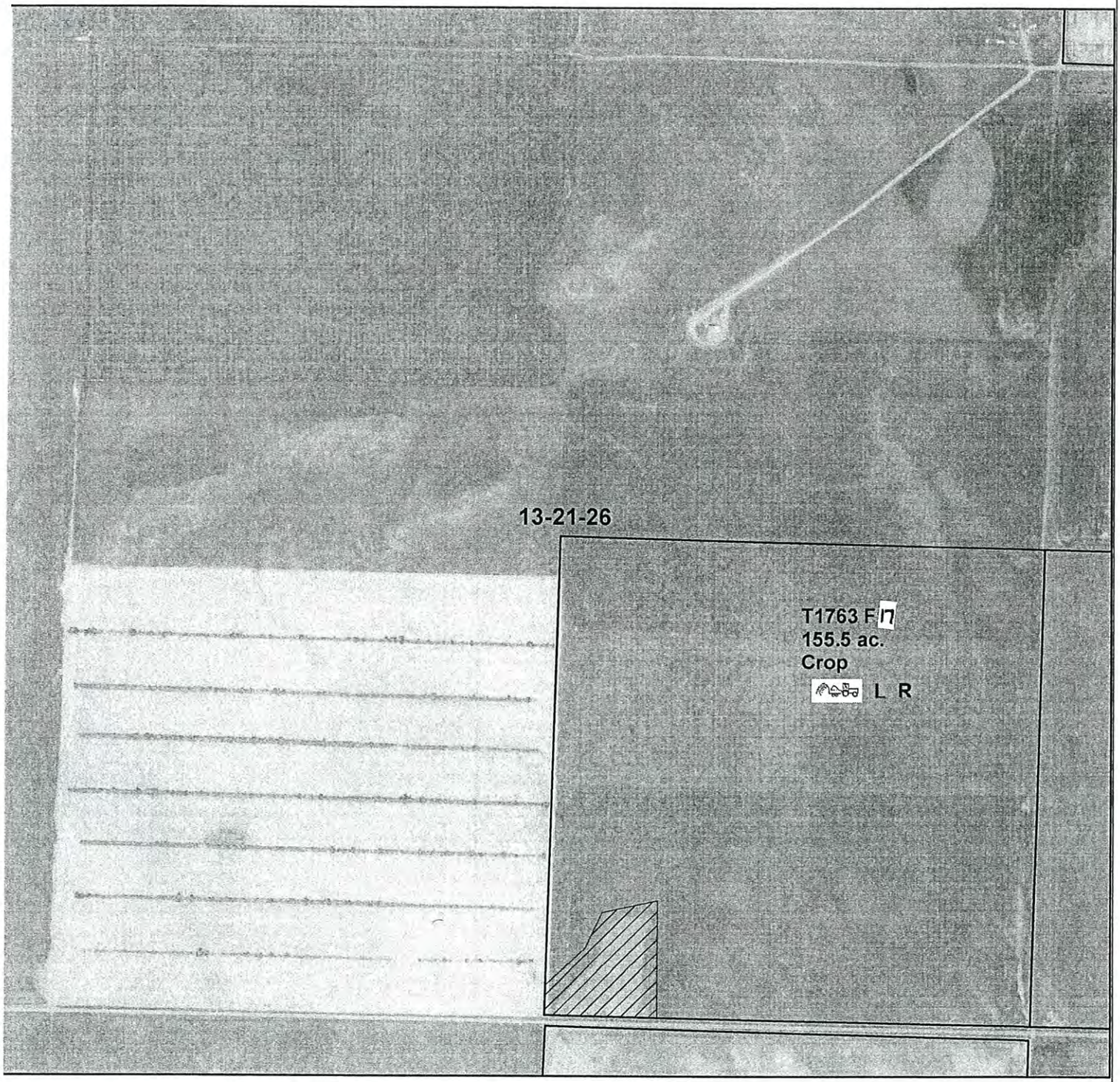
Page:		Page:

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 13-21-26

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

550 0 550 1,100 1,650 2,200
Feet

Soils Map

Customer(s): DALLAS SCHOTT

Legal Description: 13-21-26

Field Office: Mitchell - ANMT
Agency: USDA - NRCS

Legend

- Soils Map
- CNMP_2010

490 0 490 980 1,470 1,960 Feet

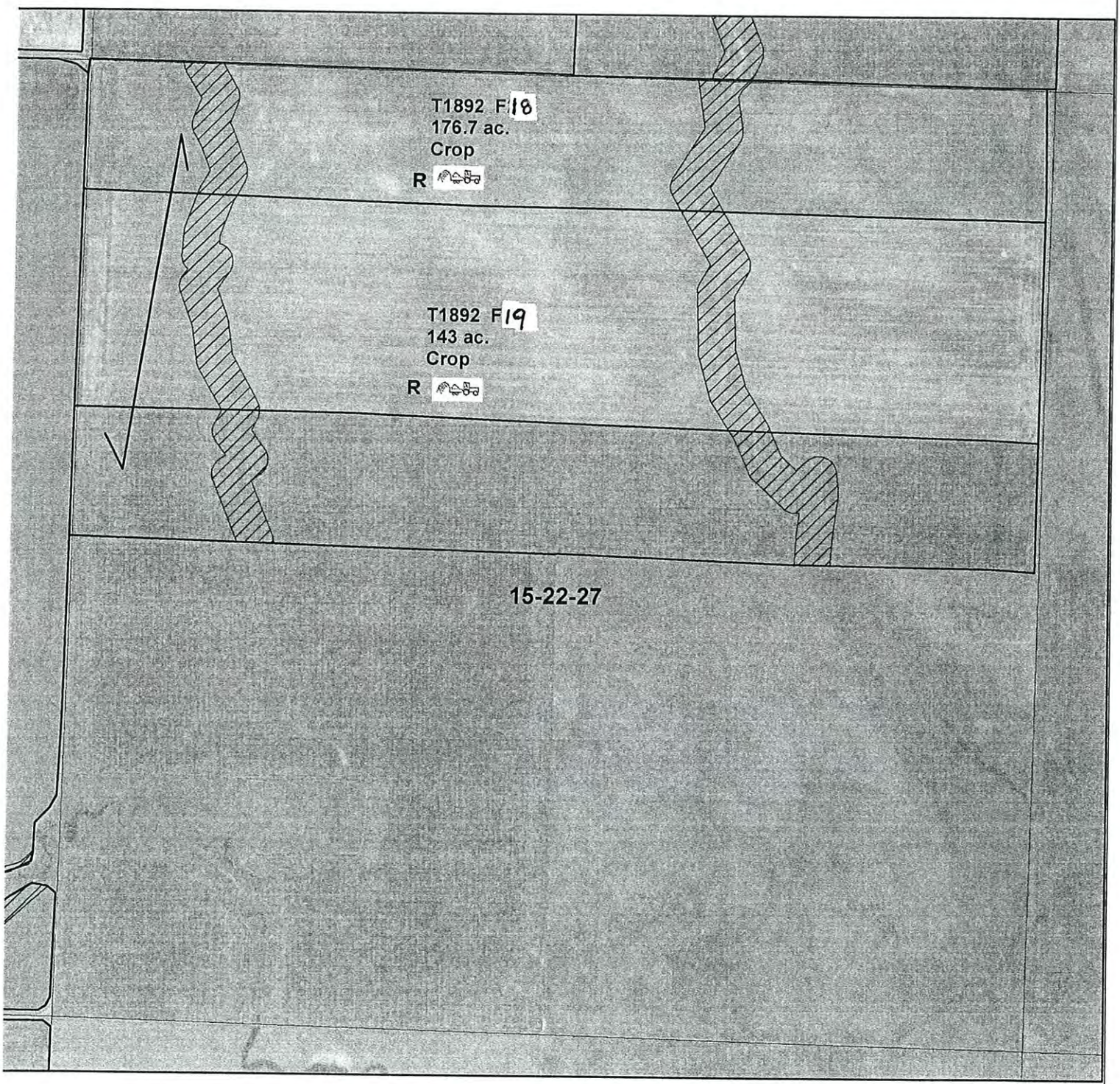
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 15-22-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

550 0 550 1,100 1,650 2,200 Feet

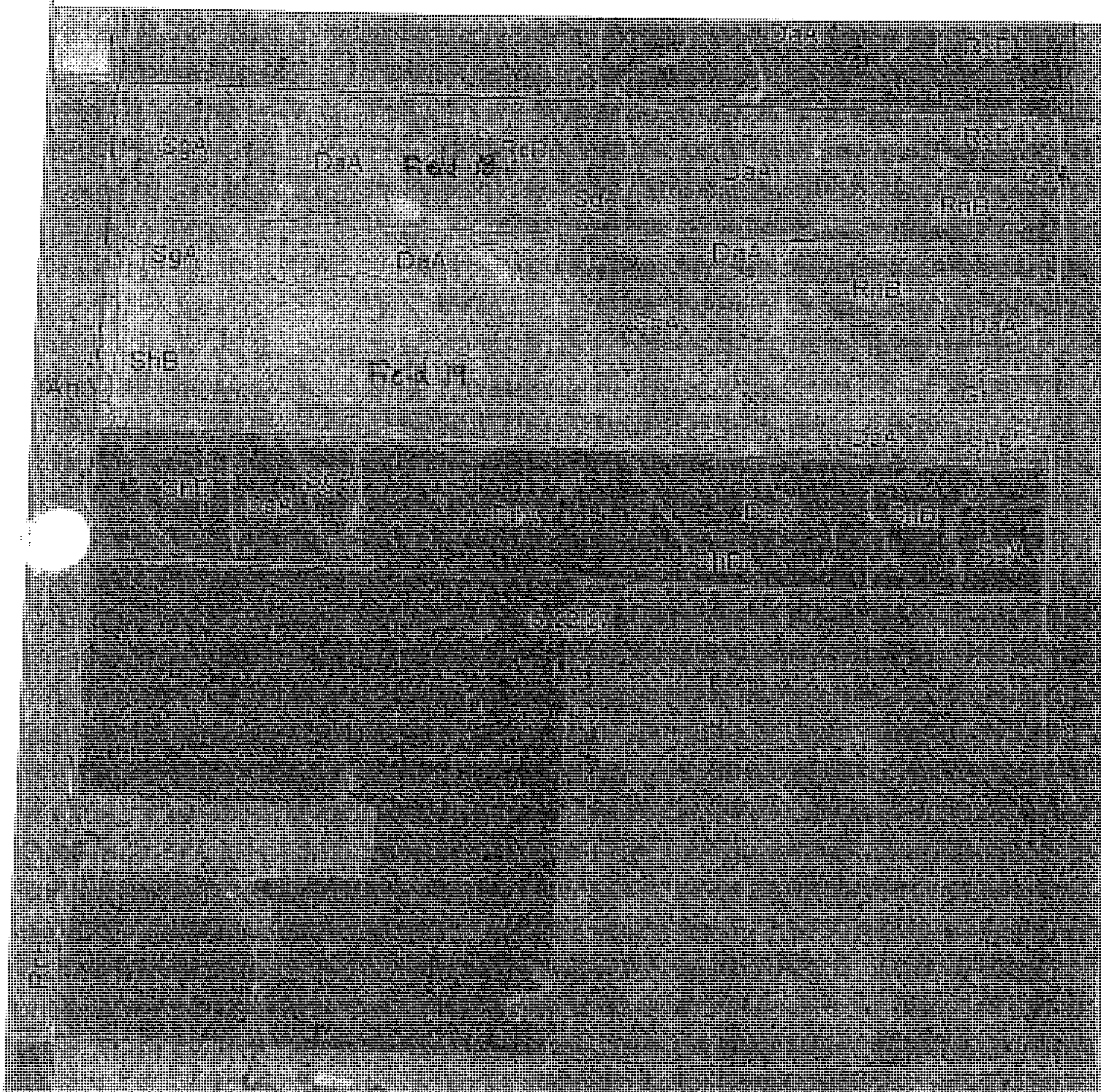
Soils Map

Owner(s): DALLAS SCHOTT

Legal Description: 15-23-27

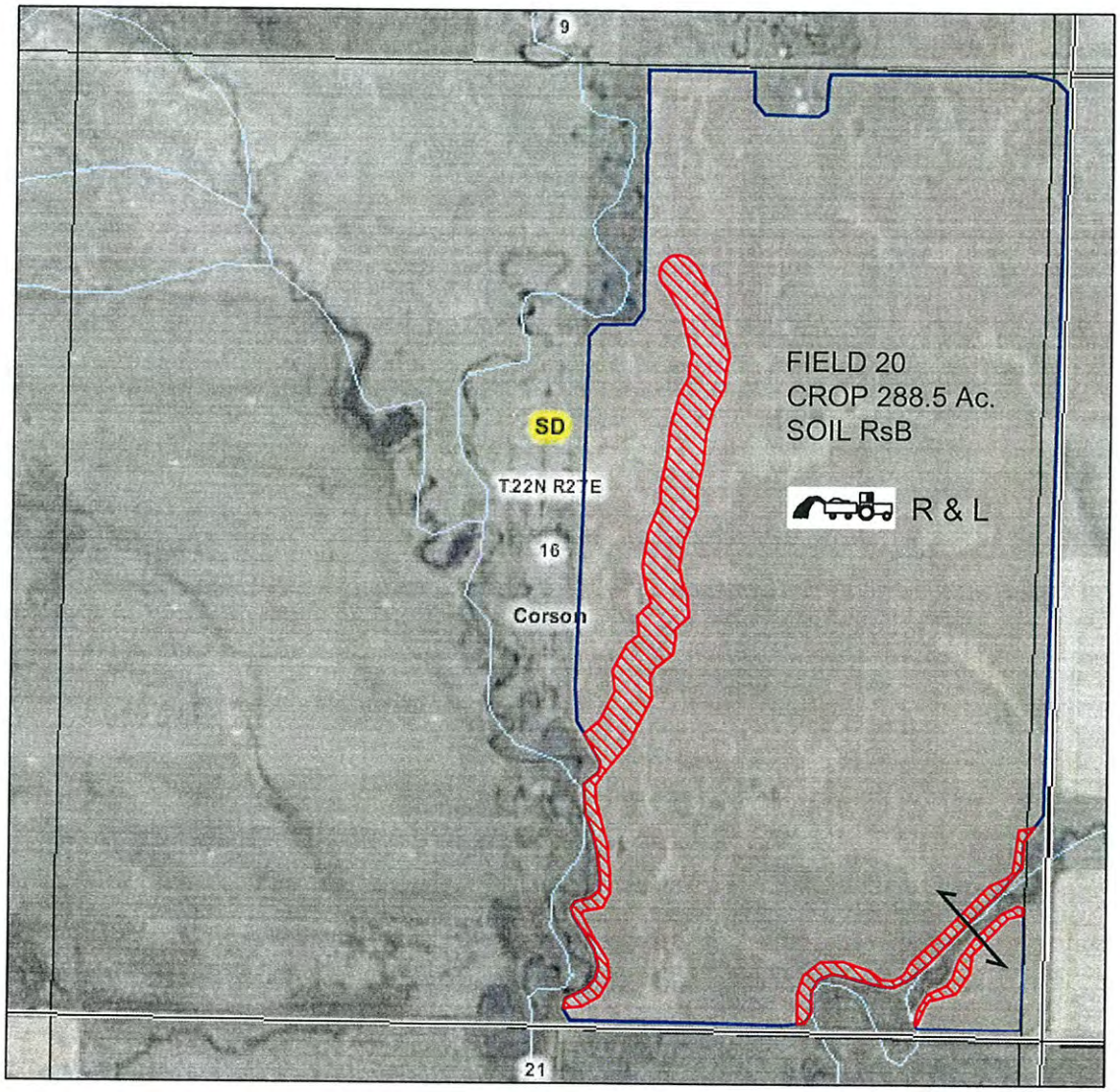
Field Office: Mitchell - ANMT

Agency: USDA - NRCS



Legend

- Soils Map
- CNMP
- Sections



SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

16 - 22N - 27E
CORSON COUNTY, SD

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	Revision
Date: 12/28/11	Date:
Scale: 1" = 1000'	Scale:
Drawn By: CAS	Drawn By:
Checked By: GGG	Checked By:
Page:	Page:

Soils Map

Armer(s): DALLAS SCHOTT

Legal Description: 16-23-27

Field Office: Mitchell - AIMT

Agency: USDA - NRCS

Legend

- Soils Map
- CNMP
- Sections

0 660 1,320 1,980 2,640 Feet

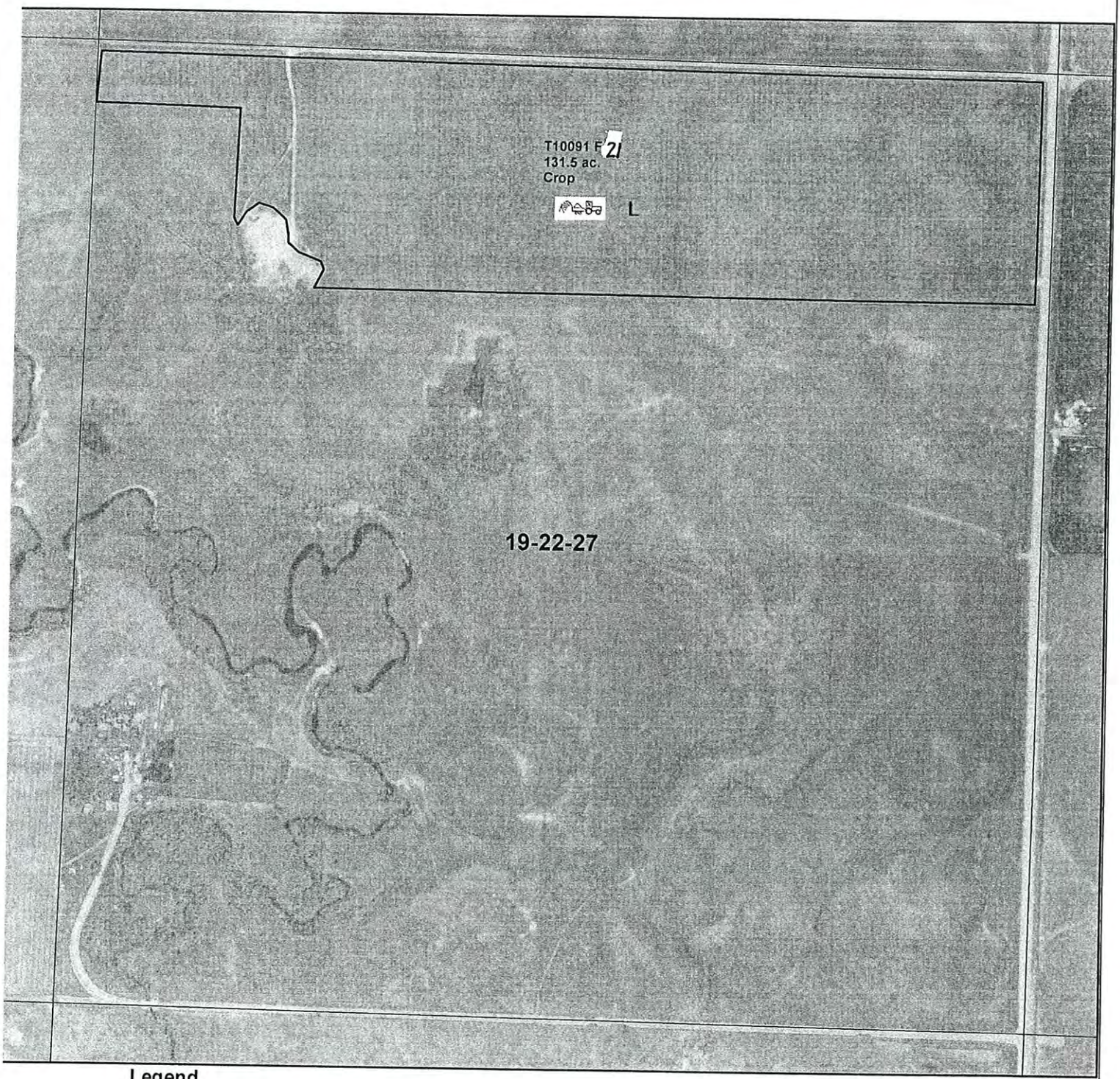
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 19-22-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

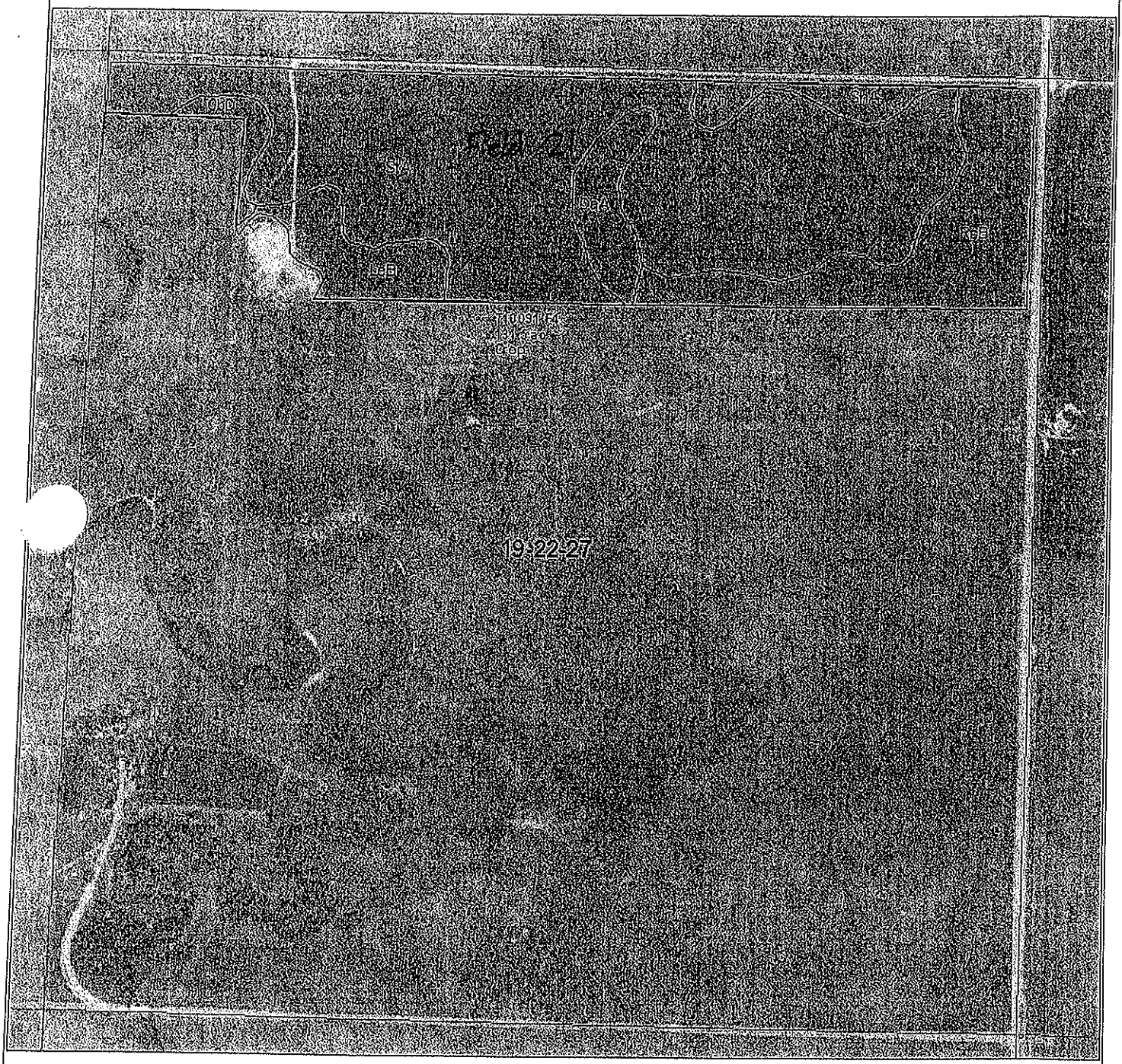
580 0 580 1,160 1,740 2,320 Feet

Soils Map

stomer(s): DALLAS SCHOTT

Legal Description: 19-22-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Soils Map

480 0 480 960 1,440 1,920 Feet

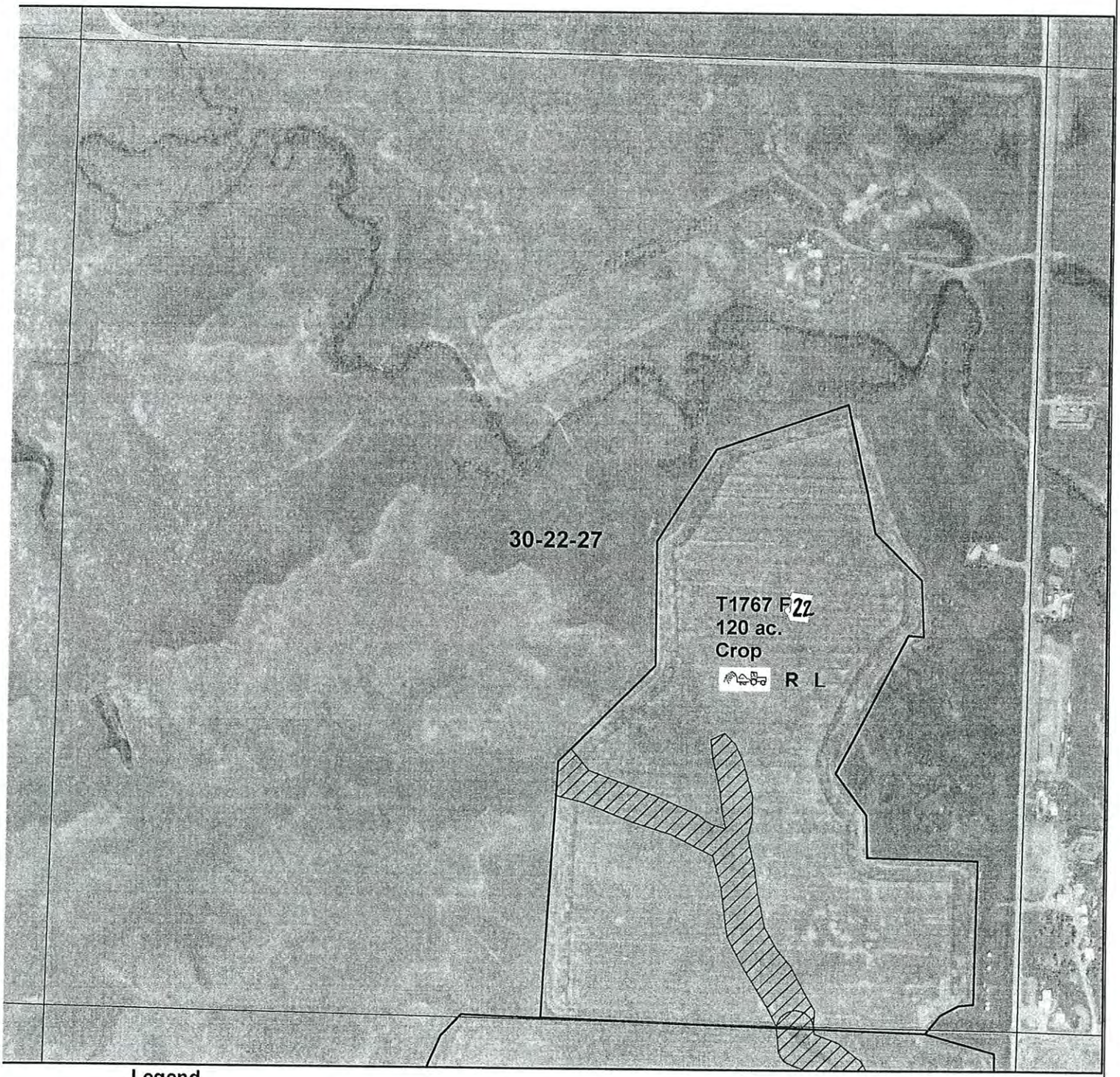
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 30-22-27

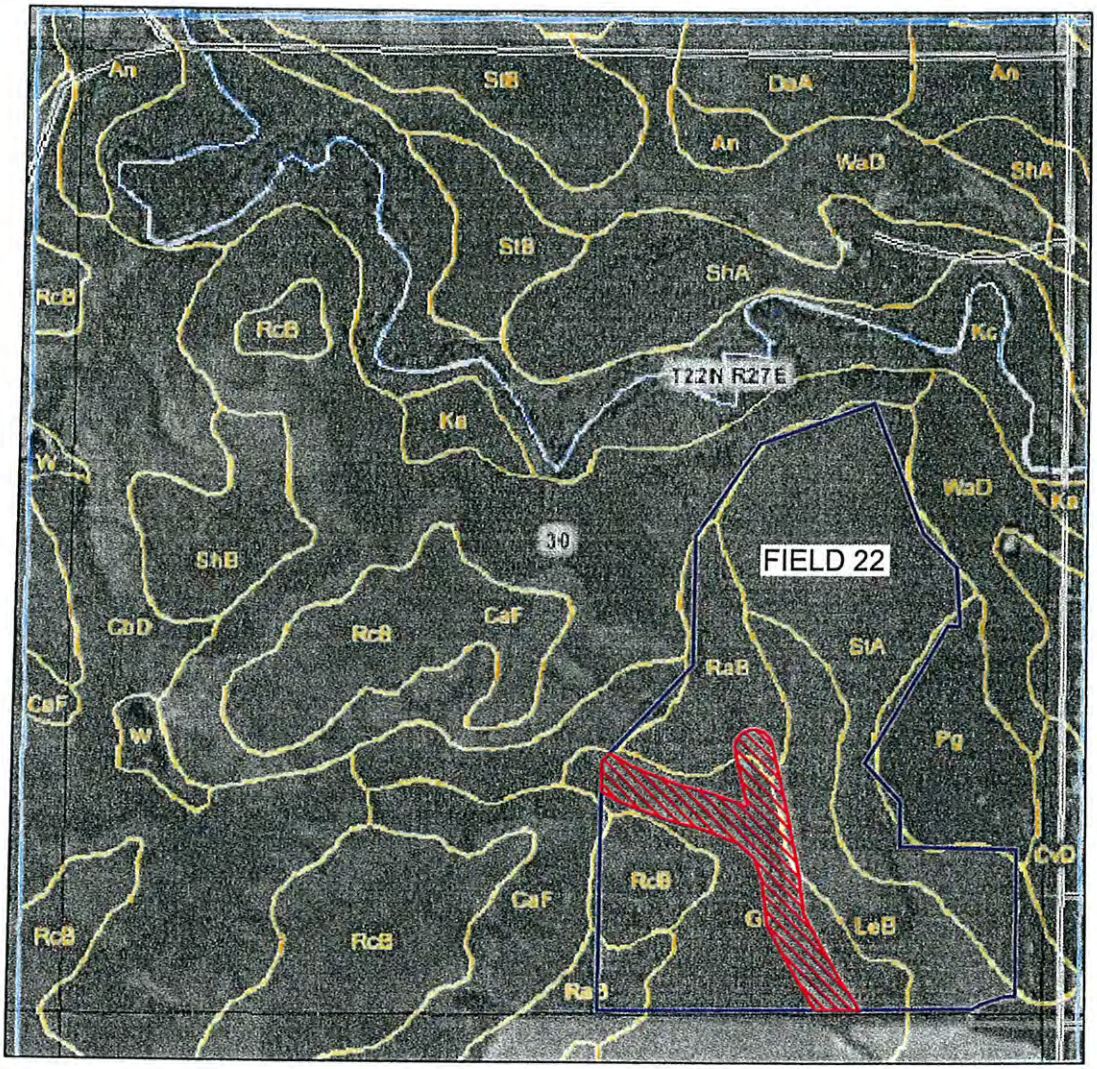
Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

580 0 580 1,160 1,740 2,320 Feet



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CaF Cabba-Amor loams, 15 to 60 percent slopes
CbD Cabba-Reeder loams, 6 to 25 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Ka Korchea loam
Kc Korchea loam, channeled
LeB Lehr loam, 2 to 6 percent slopes
Pg Pits, gravel
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
StA Stady loam, 0 to 2 percent slopes
StB Stady loam, 2 to 6 percent slopes
WaD Wabek gravelly sandy loam, 2 to 35 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

30 - 22N - 27E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

PO Box 522, Mandan, ND 58554
(701) 663-1116, FAX: (701) 667-1356

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Date: 12/28/11	Date:
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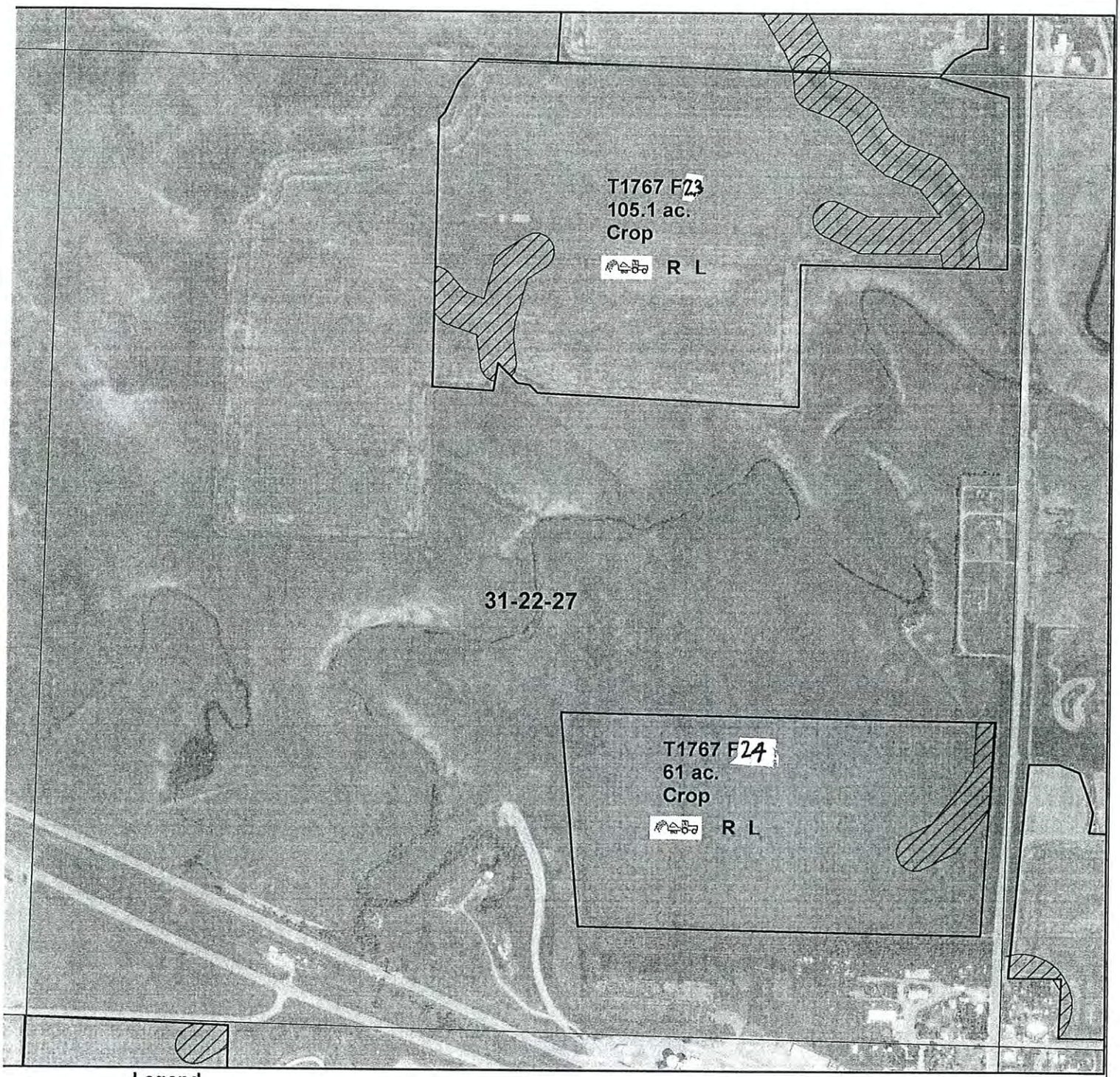
Checked By: GGG	Checked By:
Page:	Page:

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 31-22-27

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

600 0 600 1,200 1,800 2,400 Feet

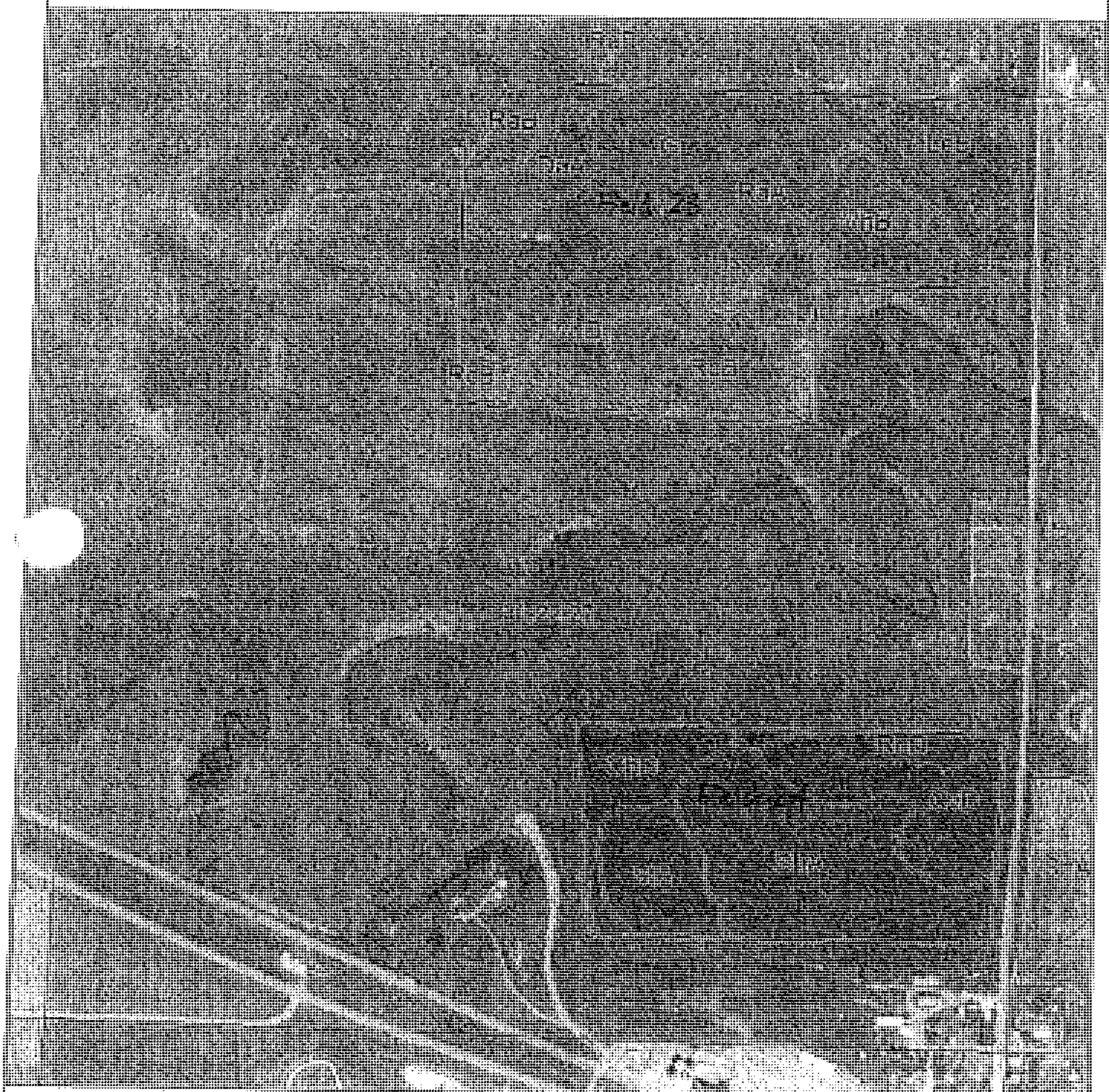
Soils Map

Owner(s): DALLAS SCHOTT

Legal Description: 31-23-27

Field Office: Mitchell - AAMT

Agency: USDA - NRCS



Legend

Soils Map

CMMP

Sections

0 | 1,000 | Feet

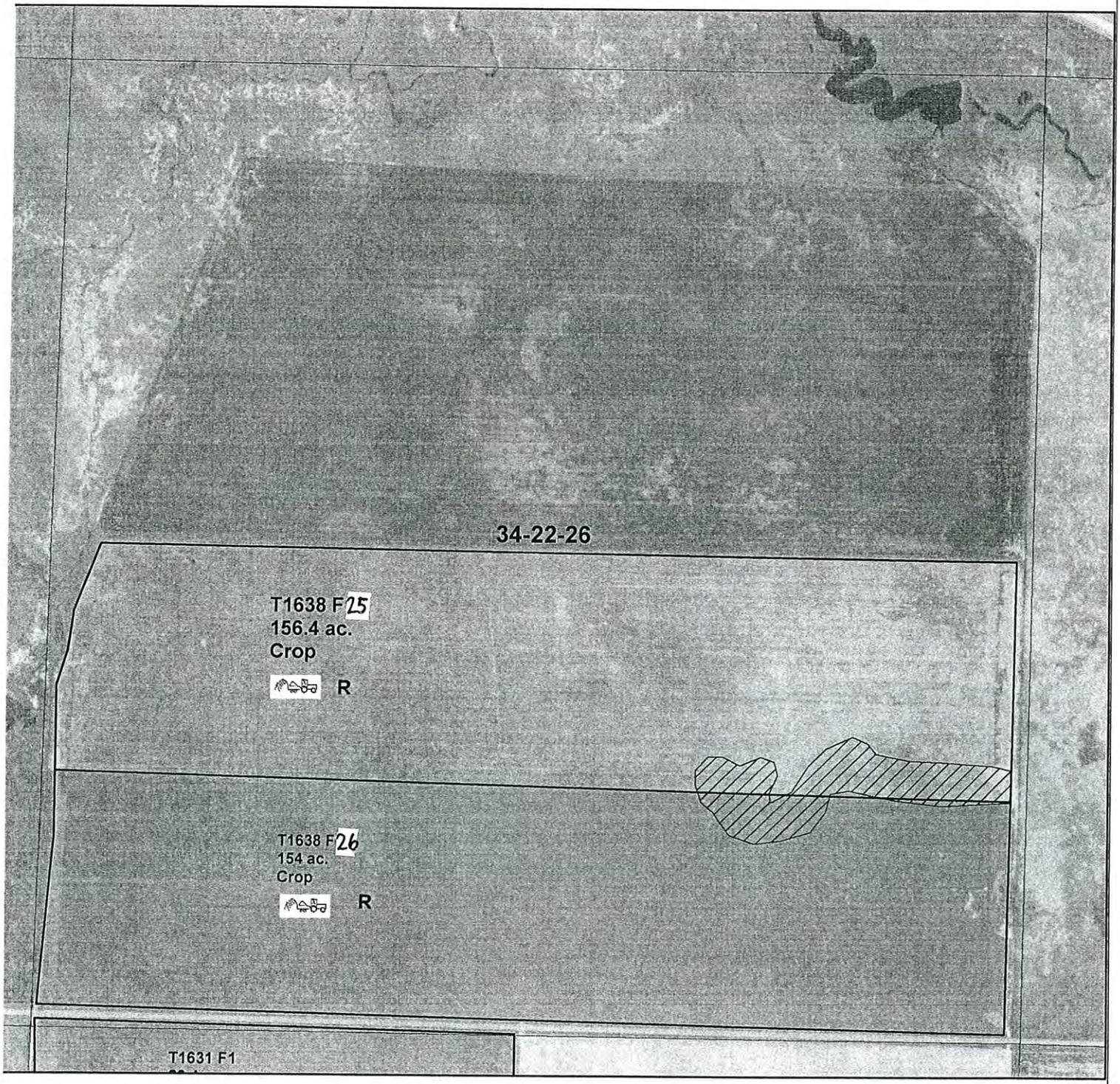
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 34-22-26

Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP_2010
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

550 0 550 1,100 1,650 2,200 Feet

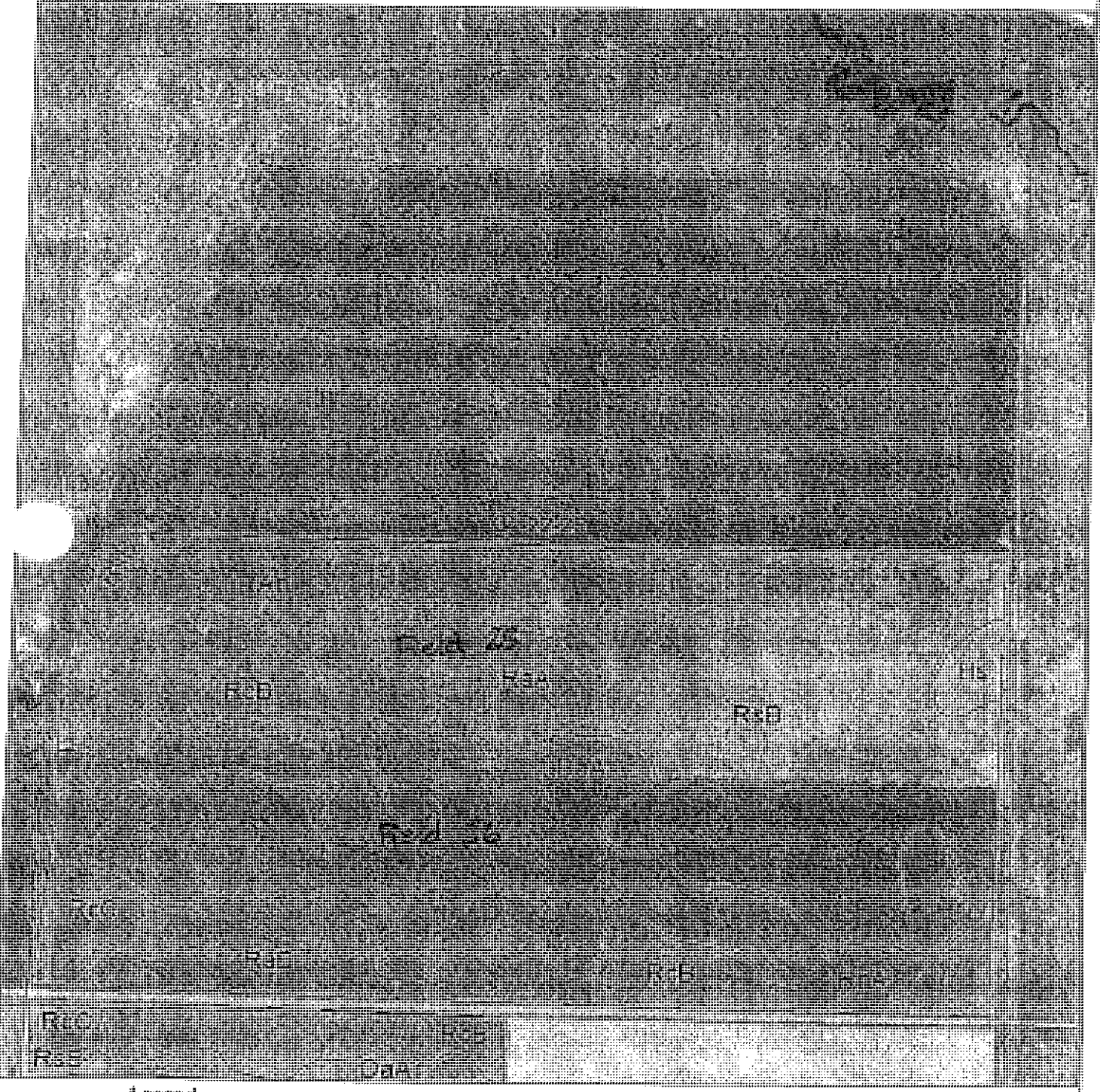
Soils Map

Farmer(s): DALLAS SCHOTT

Legal Description: 34-22-36

Field Office: Mitchell - ANWT

Agency: USDA - NRCS



Legend

- Soils Map
- CNMP
- Sections

0 640 1,280 1,920 2,560 Feet

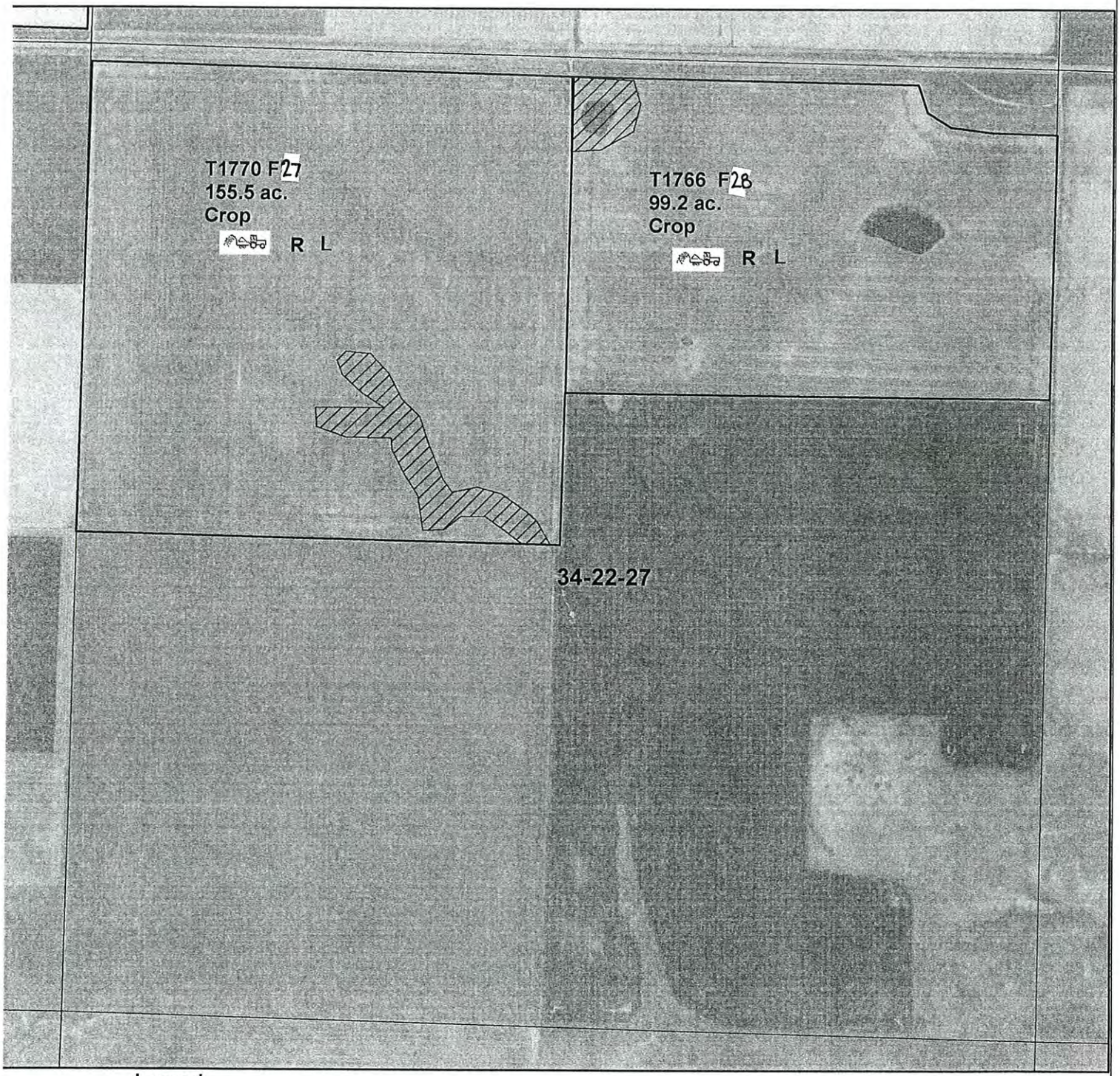
N

Water Quality Risk Assessment Map

Customer(s): DALLAS SCHOTT

Legal Description: 34-22-27

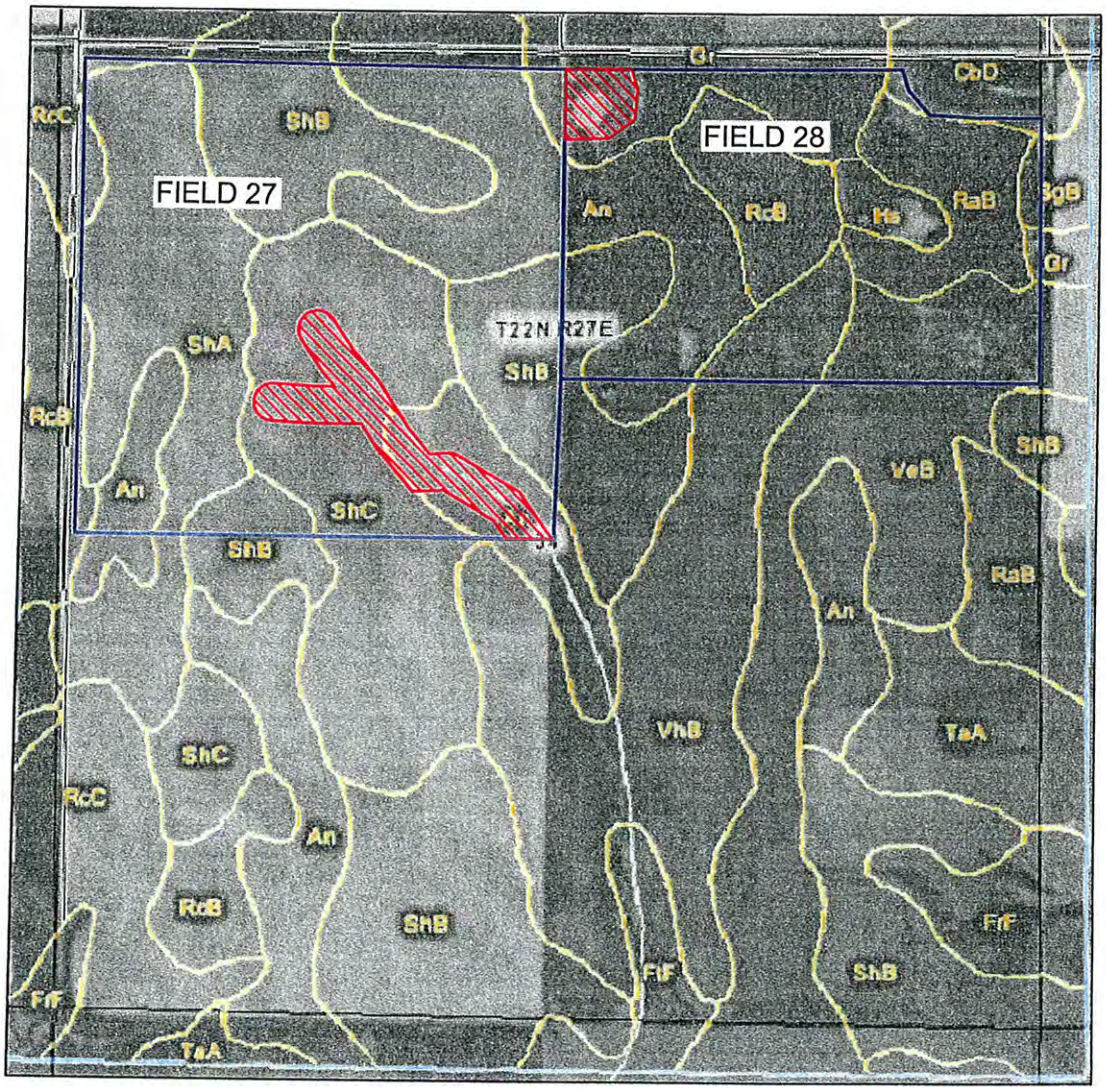
Field Office: Mitchell - ANMT
Agency: USDA - NRCS



Legend

- CNMP
- Manure Application Fields
- Setback and/or Exclusion Area
- **R** RUNOFF - High Risk
- **L** LEACHING - High Risk

590 0 590 1,180 1,770 2,360 Feet



SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CbD Cabba-Reeder loams, 6 to 25 percent slopes
FrF Flasher-Rock outcrop complex, 30 to 60 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
SgB Savage silt loam, 3 to 6 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
ShC Shambo loam, 6 to 9 percent slopes
TaA Tally fine sandy loam, 0 to 6 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

34 - 22N - 27E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
PO Box 522, Mandan, ND 58554
(701) 663-1116, FAX: (701) 667-1356

		Revision
Date:	12/28/11	Date:
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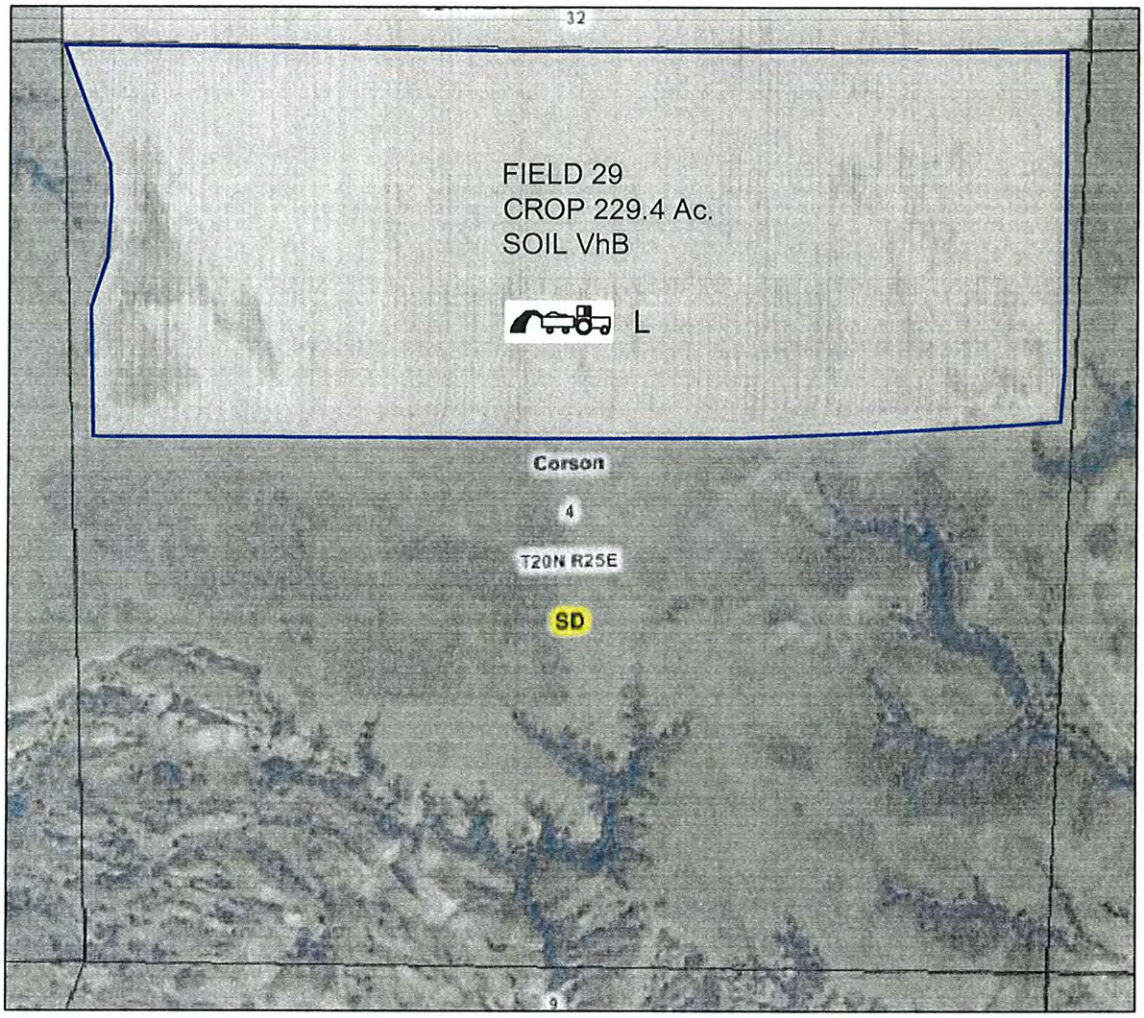

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

4 - 20N - 25E
CORSON COUNTY, SD

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Consulting Engineers

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Date:	12/28/11	Date:
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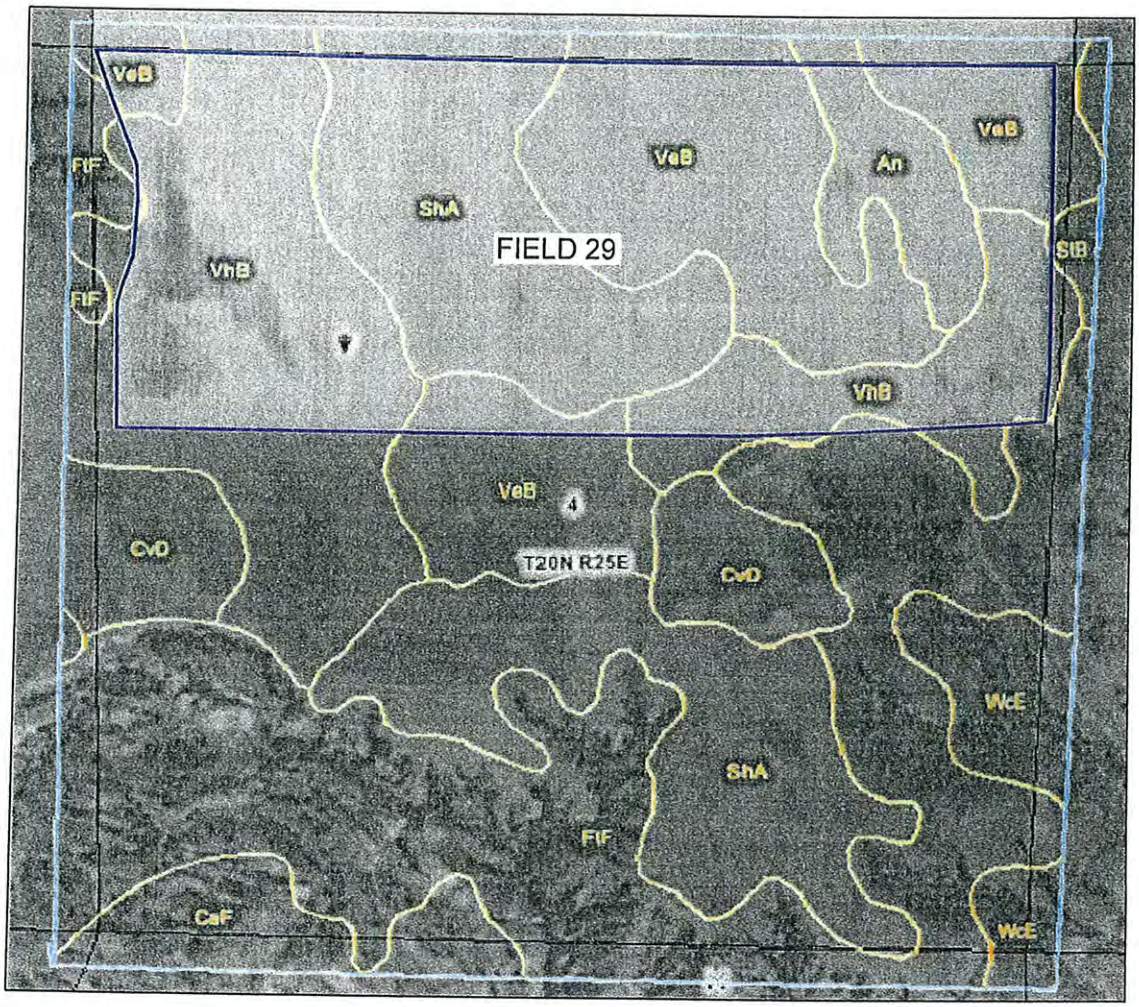

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CaF Cabba-Amor loams, 15 to 60 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
StB Stady loam, 2 to 6 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes
WcE Wayden-Cabba complex, 9 to 40 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

4 - 20N - 25E
CORSON COUNTY, SD

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Consulting Engineers
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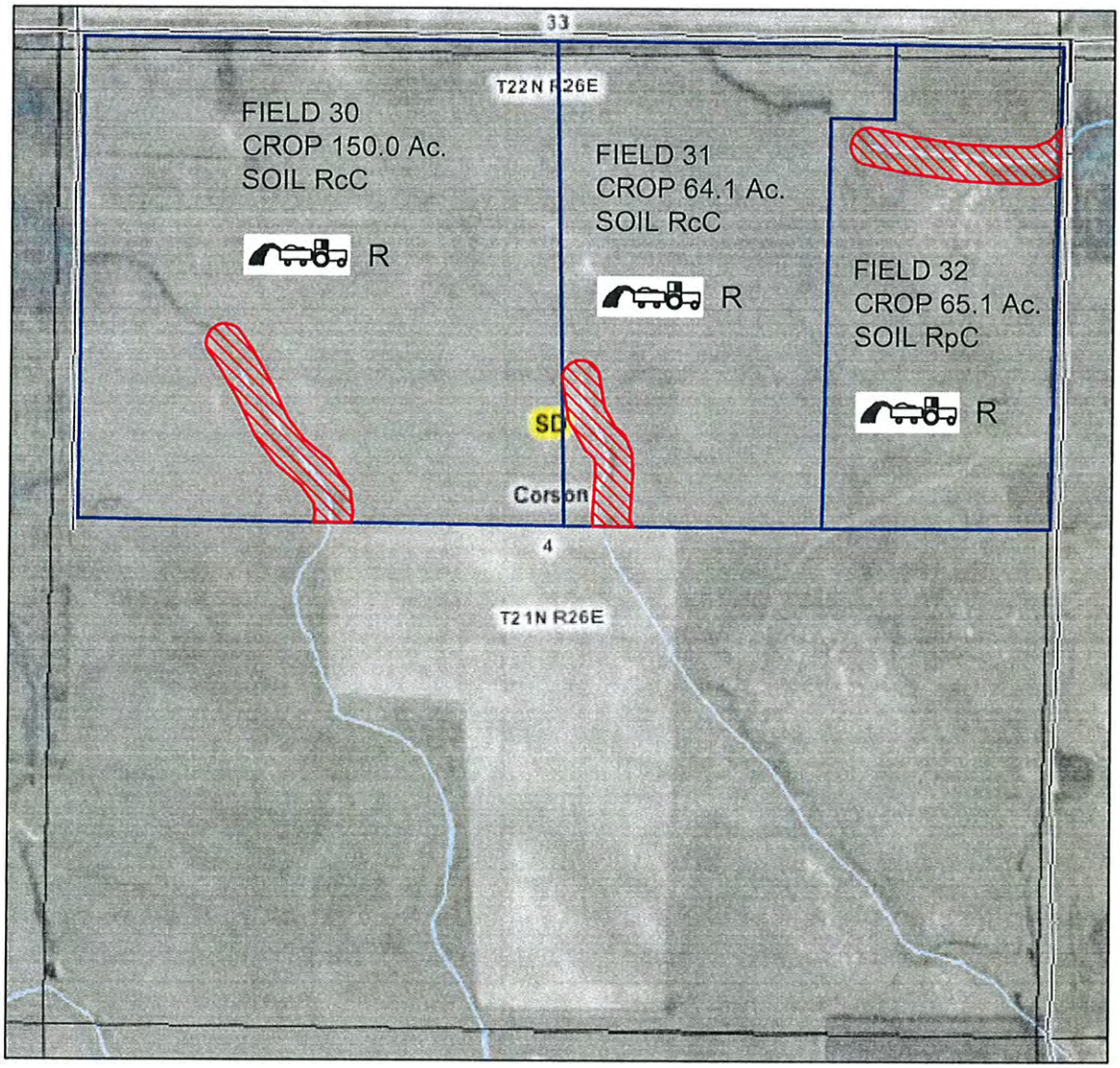

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

4 - 21N - 26E
CORSON COUNTY, SD

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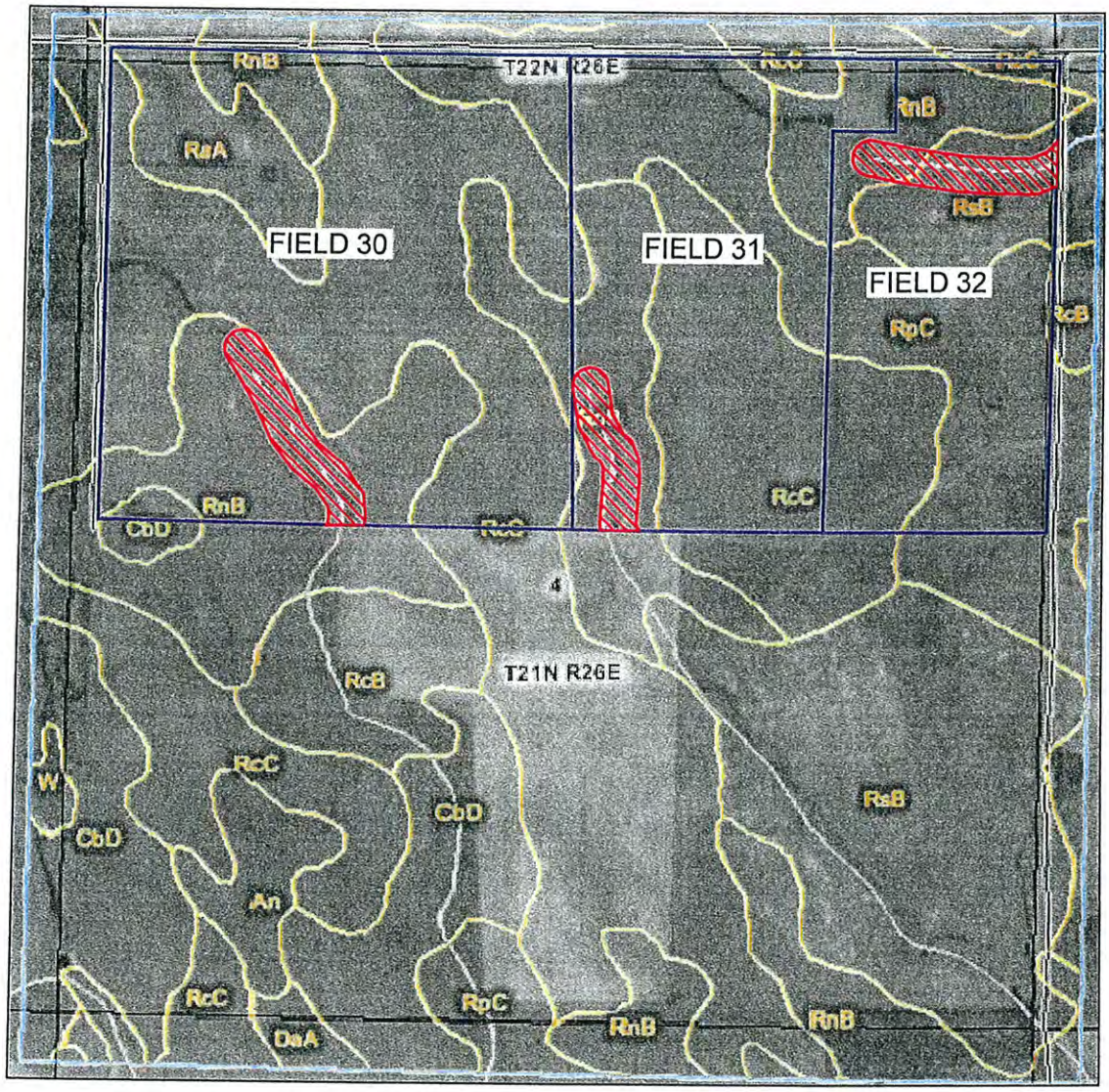

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CaF Cabba-Amor loams, 15 to 60 percent slopes
CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Hs Heil silt loam
RaA Reeder loam, 0 to 2 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

4 - 21N - 26E
CORSON COUNTY, SD

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Consulting Engineers

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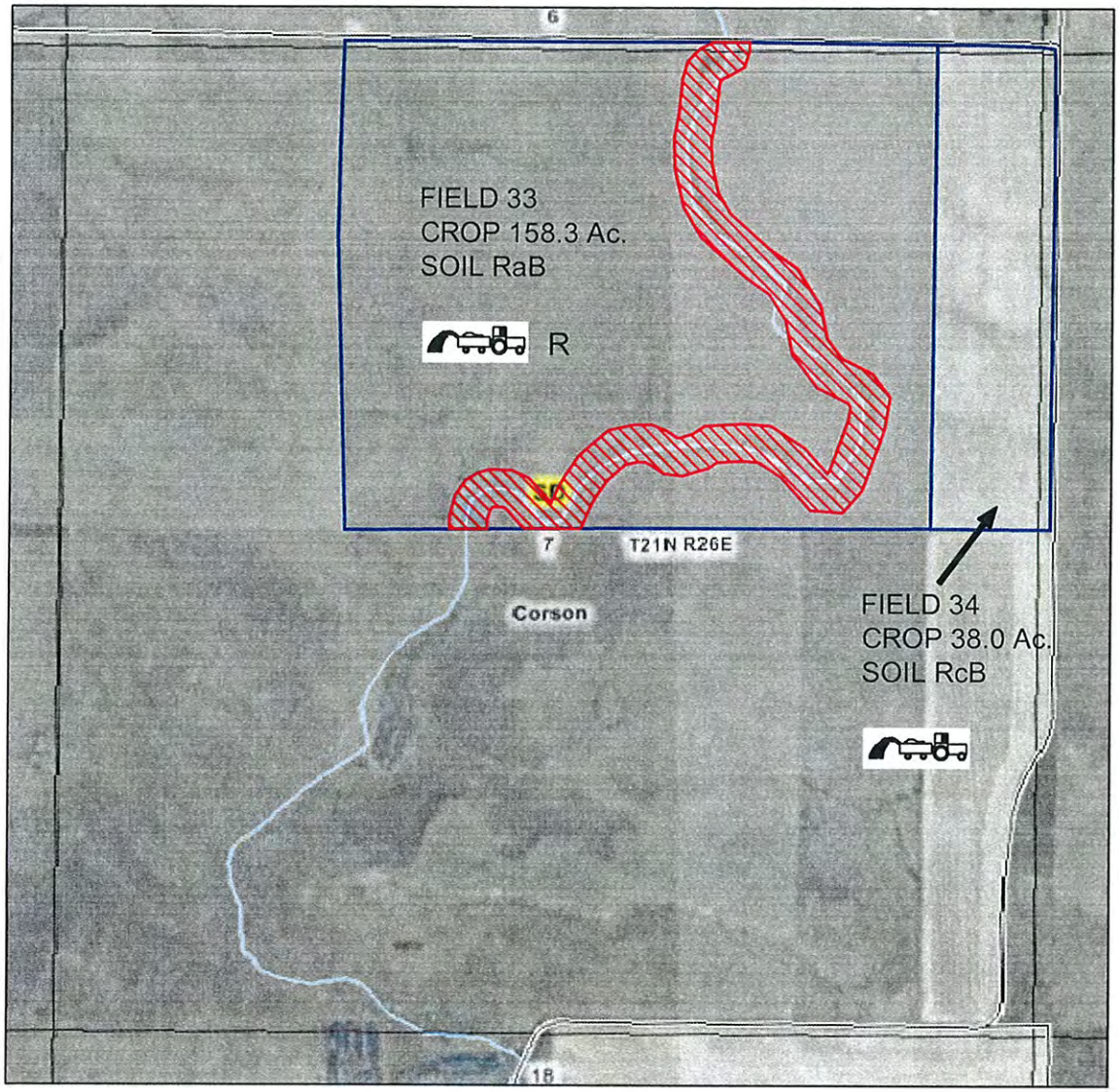

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

- Manure Application Fields
- Land Application Area
- R RUNOFF - High Risk
- L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

7 - 21N - 26E
CORSON COUNTY, SD

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Consulting Engineers
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		Revision
Date:	12/28/11	Date:
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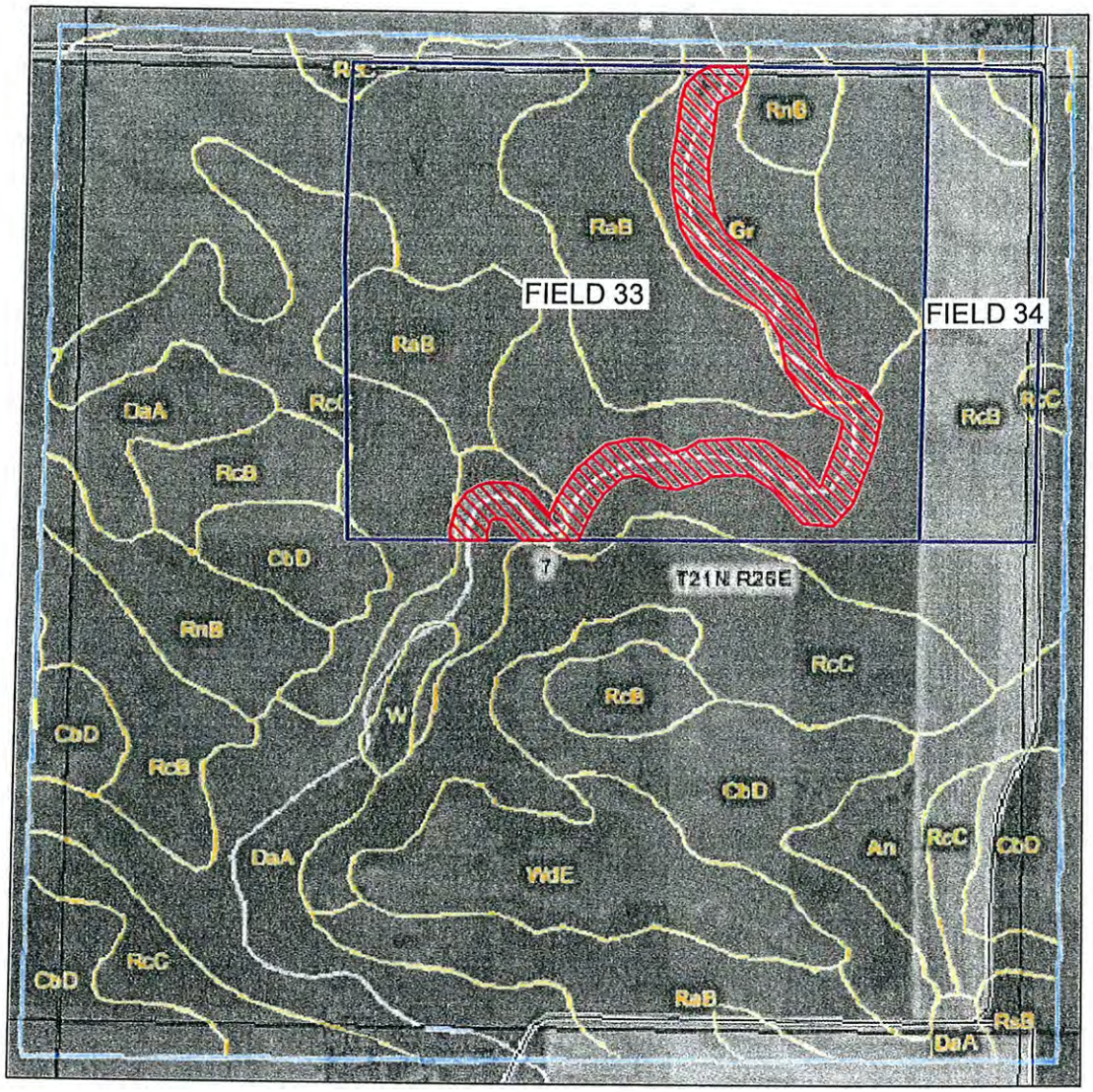

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
WdE Wayden and Cabba soils, 6 to 40 percent slopes, extremely stony

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

7 - 21N - 26E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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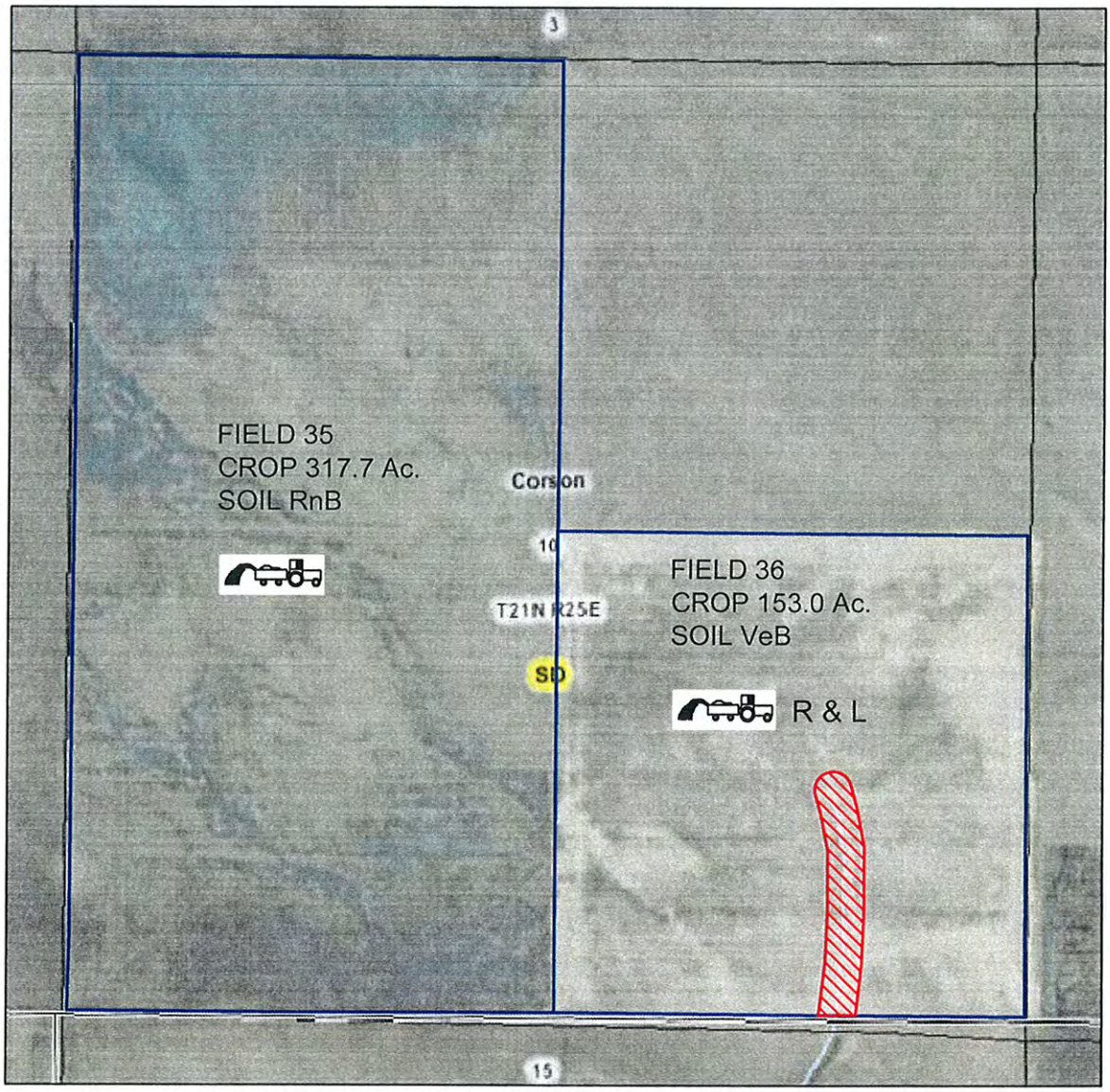

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

10 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
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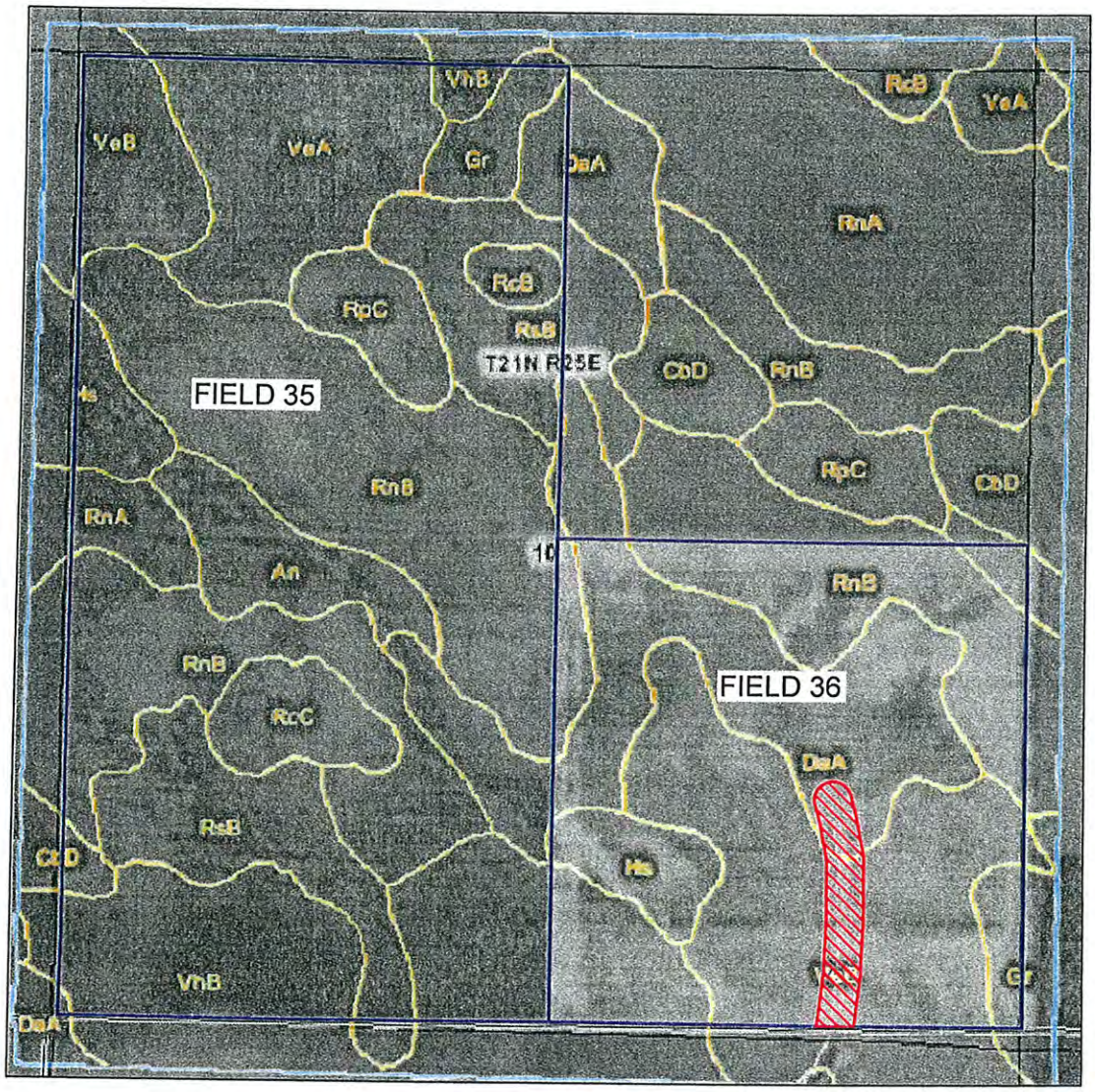

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CbD Cabba-Reeder loams, 6 to 25 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnA Regent silty clay loam, 0 to 2 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes 5
VeA Vebar fine sandy loam, 0 to 2 percent slopes 4
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

10 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
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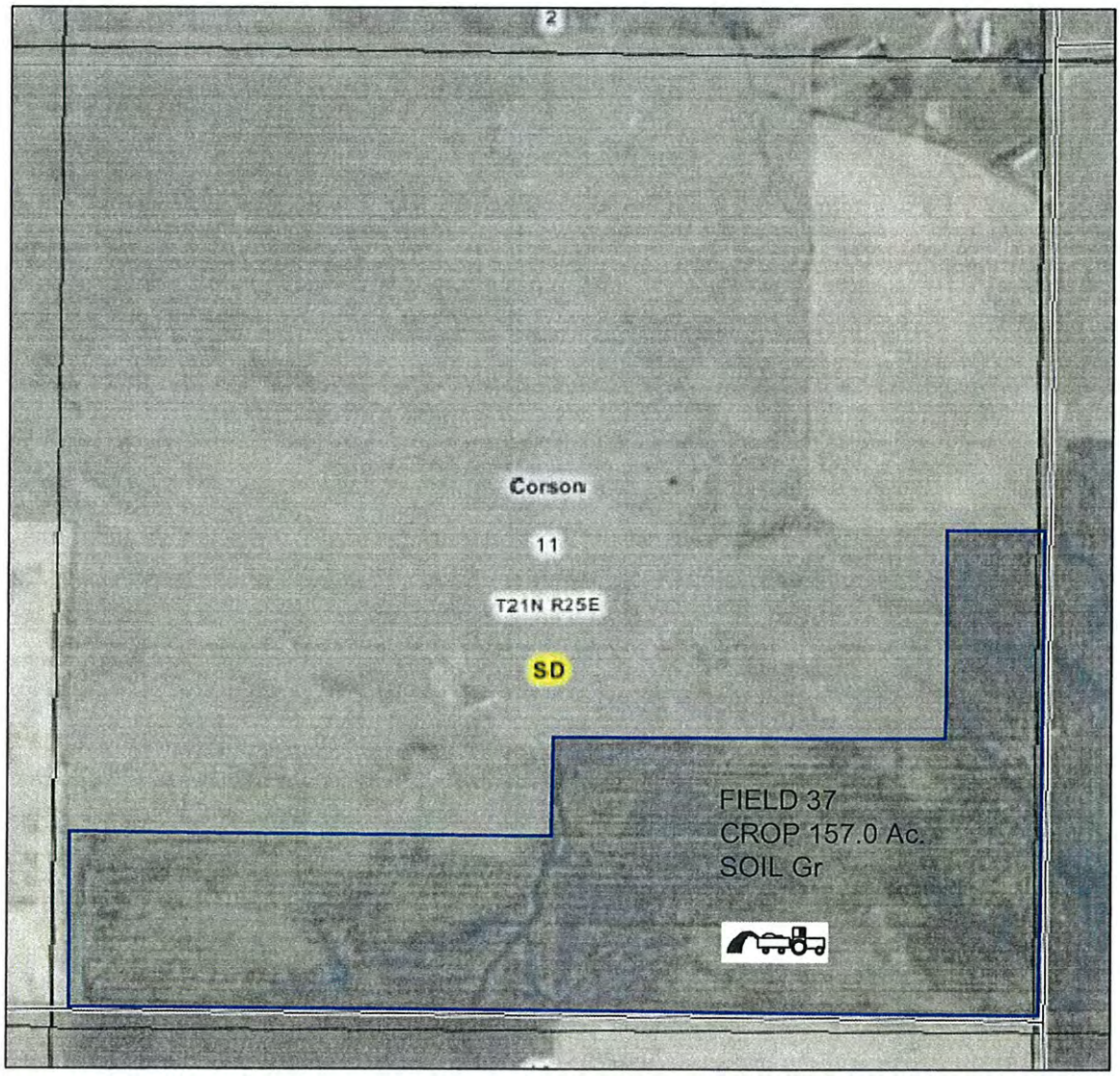

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

11 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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		Revision
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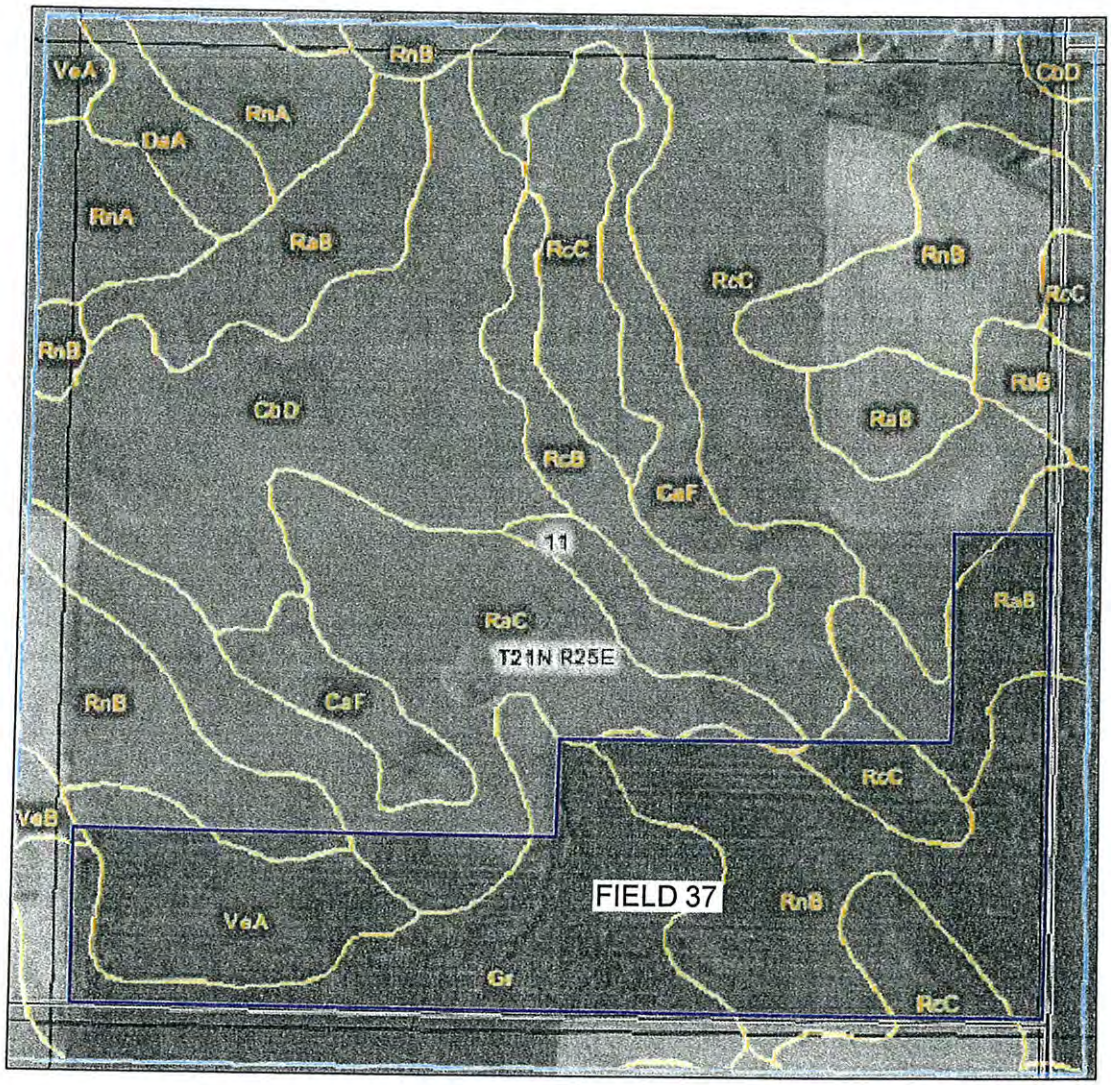

SCALE, FEET

0 500 1000 1500 2000

Legend:

CaF Cabba-Amor loams, 15 to 60 percent slopes
CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
RaB Reeder loam, 2 to 6 percent slopes
RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnA Regent silty clay loam, 0 to 2 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

11 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
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	Revision
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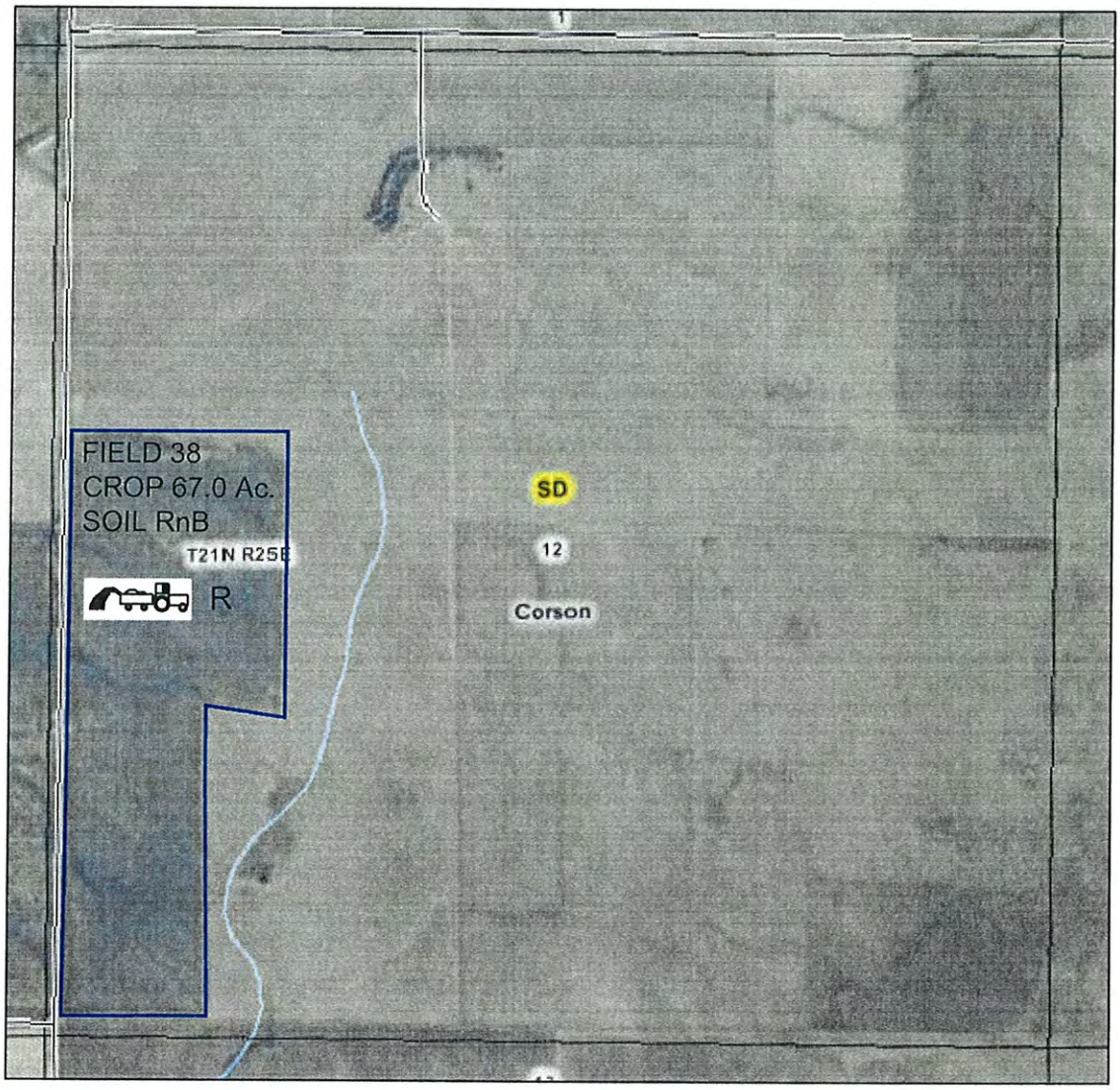

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

12 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
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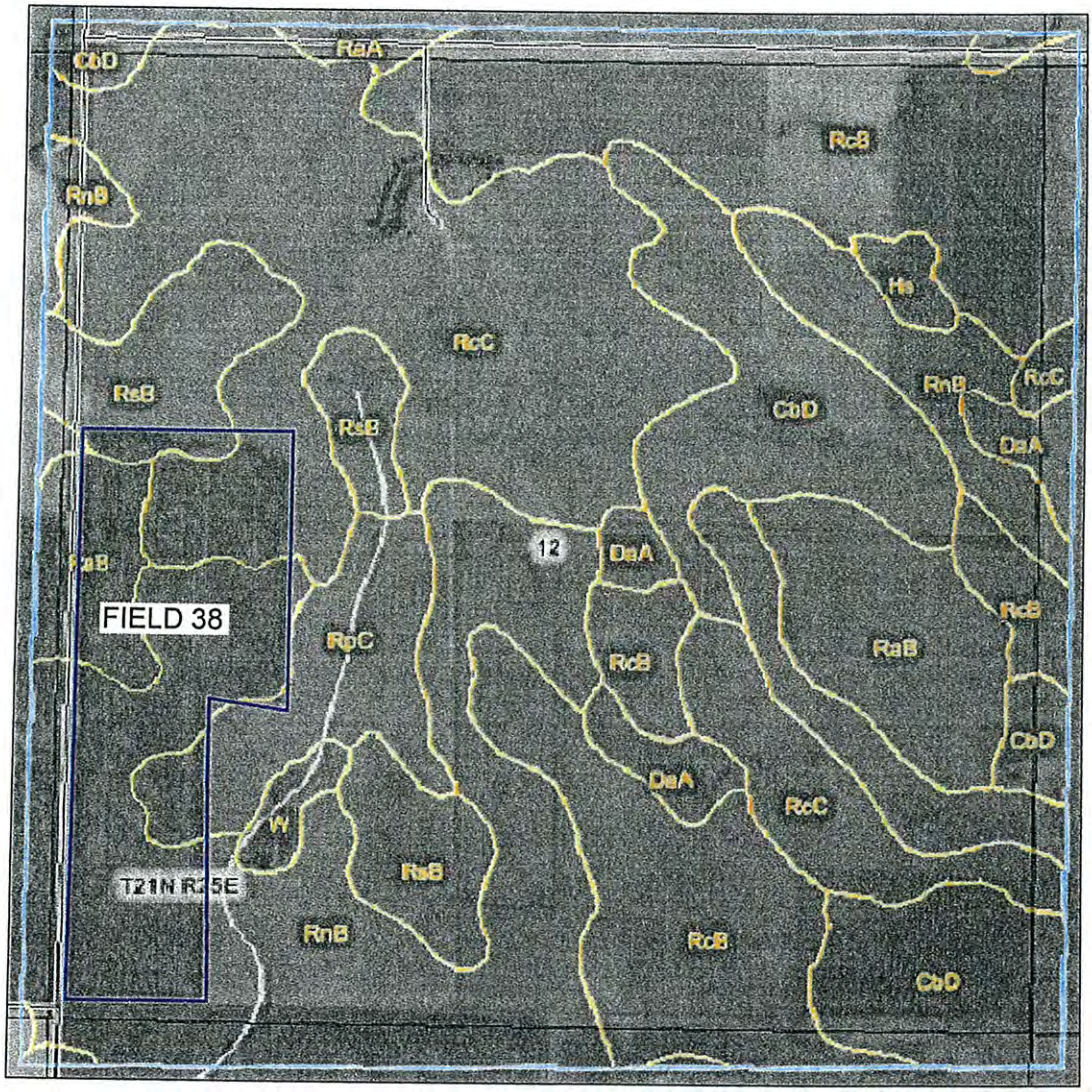

SCALE, FEET

0 500 1000 1500 2000

Legend:

CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaA Reeder loam, 0 to 2 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
WdE Wayden and Cabba soils, 6 to 40 percent slopes, extremely stony

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

12 - 21N - 25E
CORSON COUNTY, SD

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Consulting Engineers
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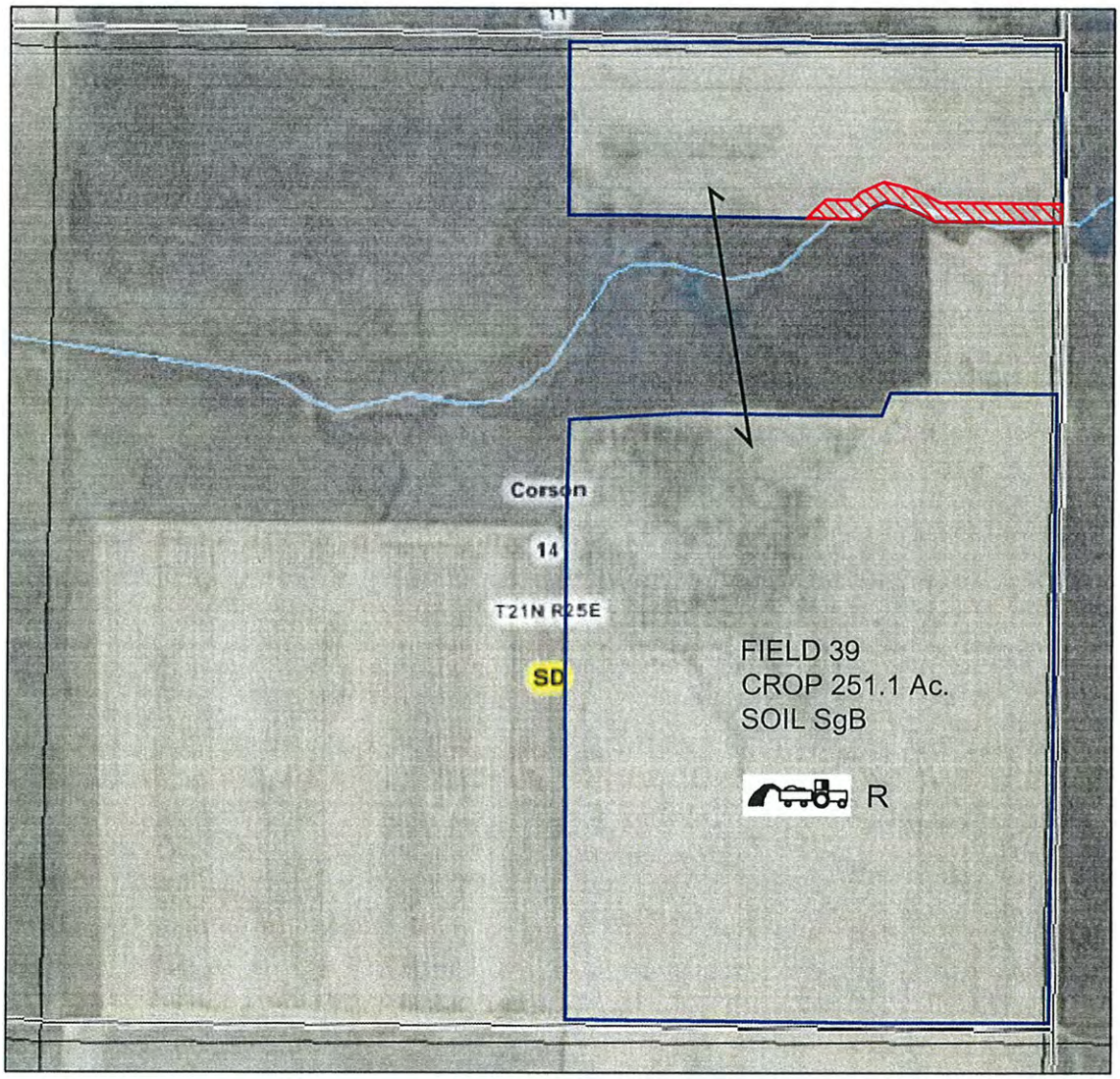

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

14 - 21N - 25E
CORSON COUNTY, SD

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Consulting Engineers

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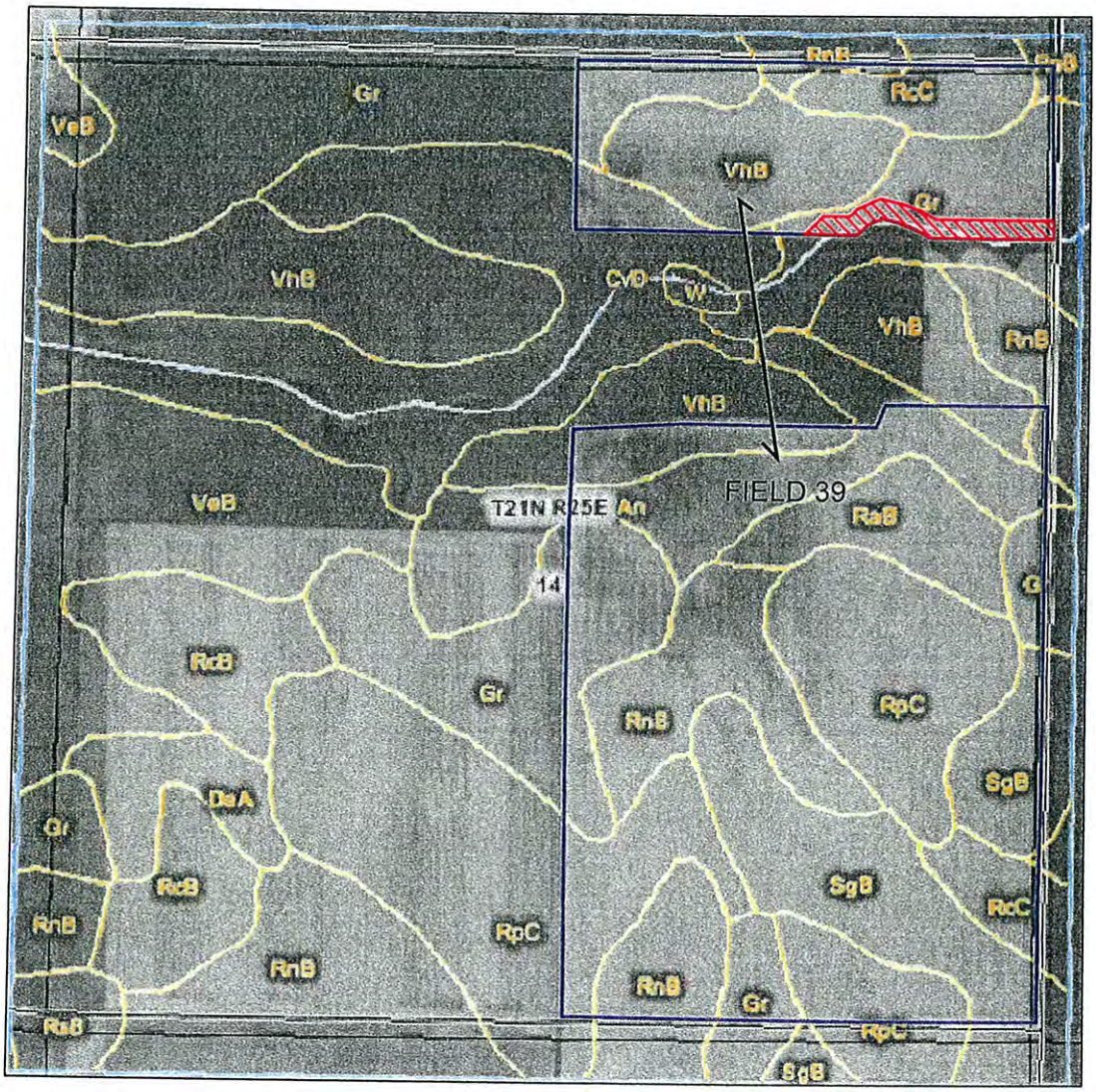

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgB Savage silt loam, 3 to 6 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

14 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
PO Box 522, Mandan, ND 58554
(701) 663-1116, FAX: (701) 667-1356

		Revision
Date:	12/28/11	Date:
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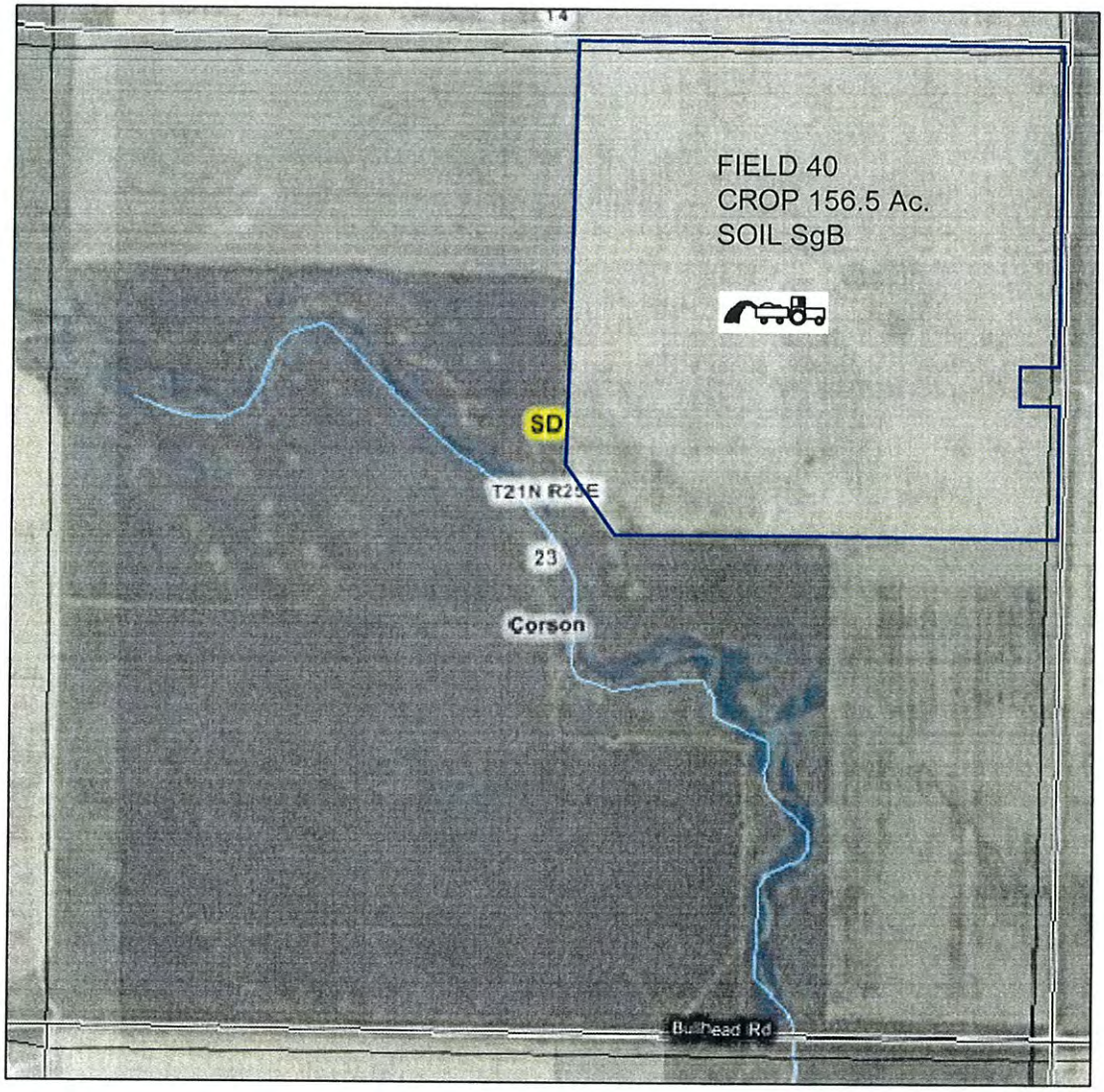

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

23 - 21N - 25E
CORSON COUNTY, SD

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Consulting Engineers
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Date:	12/28/11	Date:
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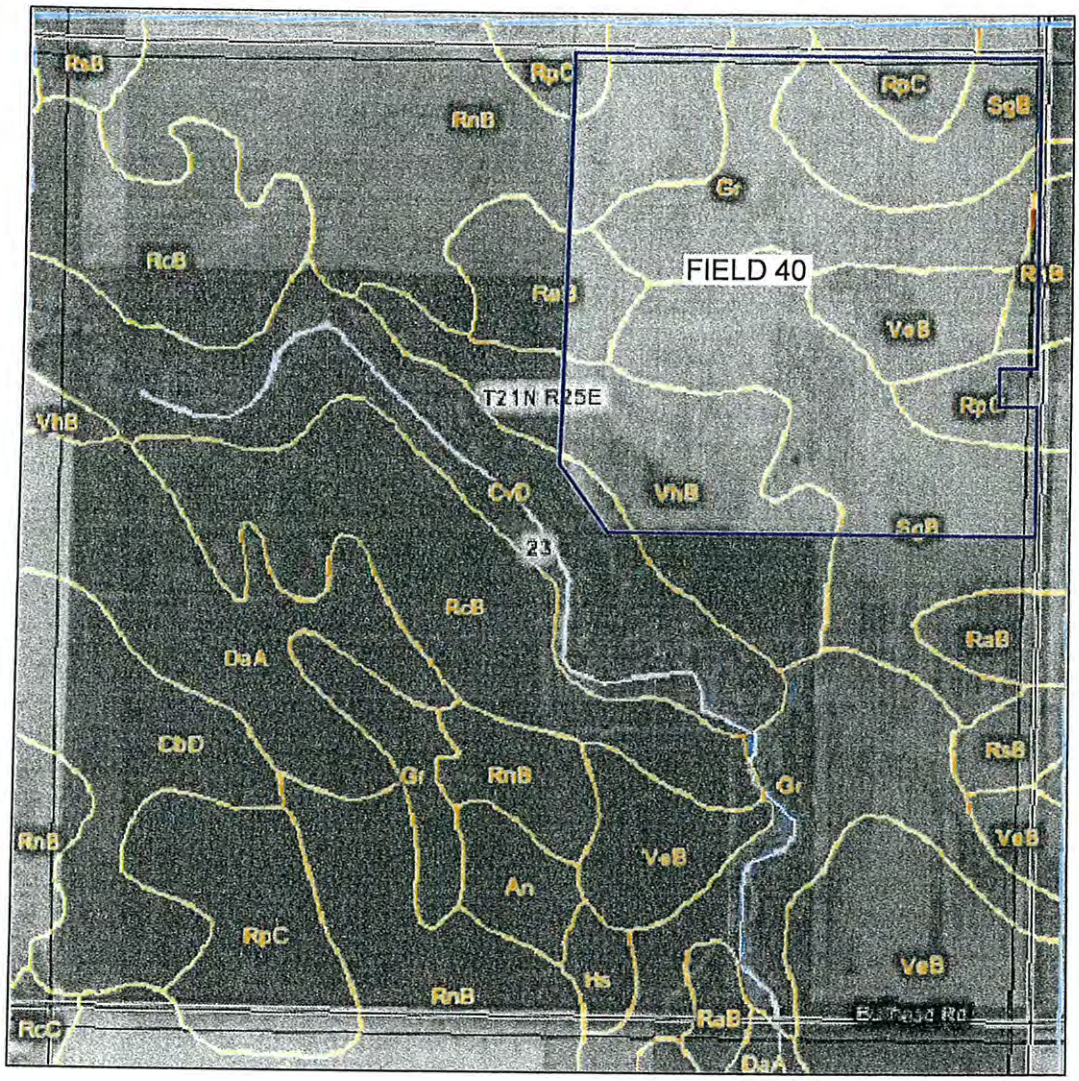

SCALE, FEET

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Legend:

An Arnegard loam
CbD Cabba-Reeder loams, 6 to 25 percent slopes
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgB Savage silt loam, 3 to 6 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

23 - 21N - 25E
CORSON COUNTY, SD

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Page:	Page:

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

24 - 21N - 26E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
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Date: 12/28/11	Date:
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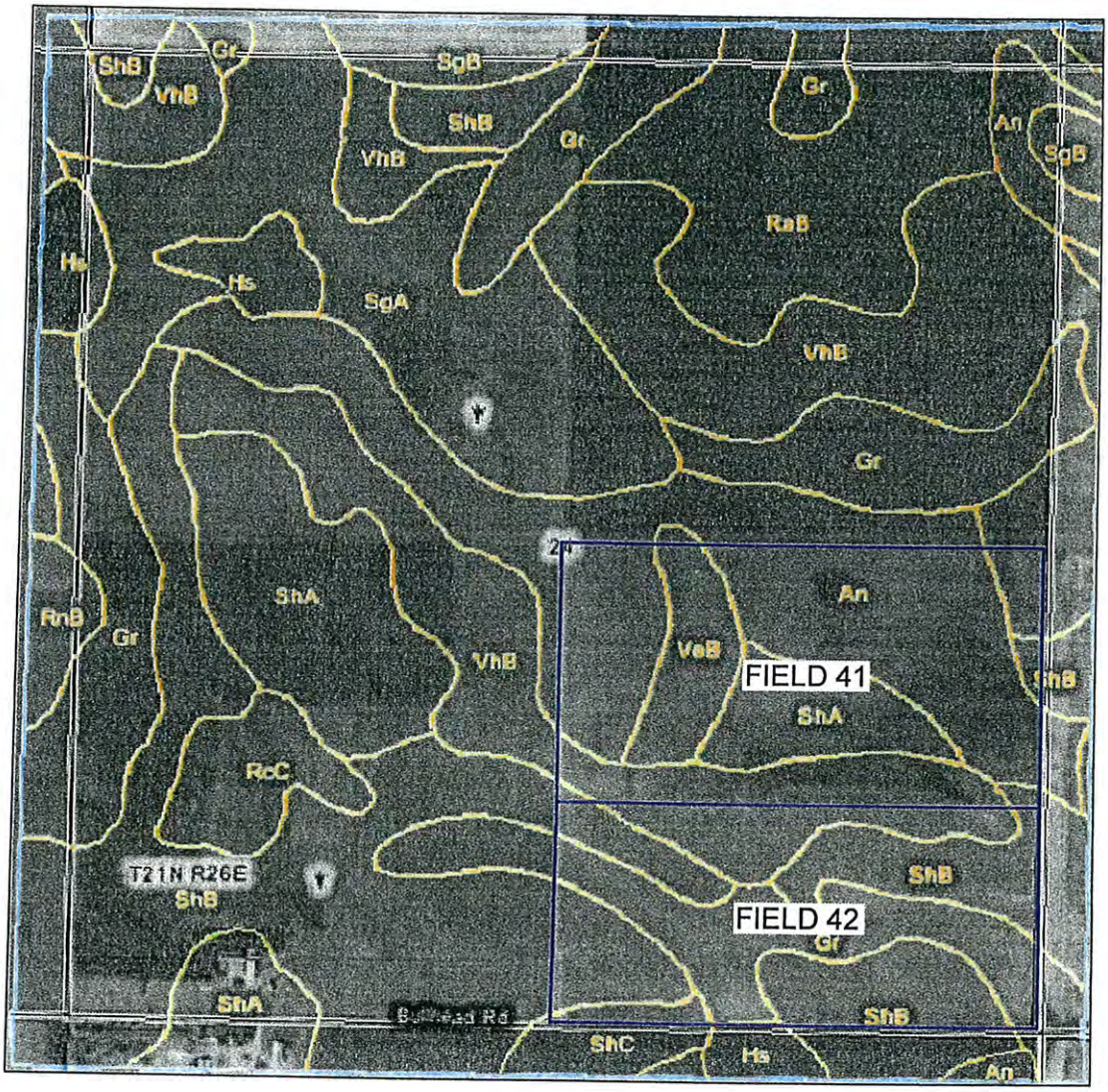

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
Gr Grail silty clay loam
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
SgA Savage silt loam, 0 to 3 percent slopes
SgB Savage silt loam, 3 to 6 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
ShC Shambo loam, 6 to 9 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

24 - 21N - 26E
CORSON COUNTY, SD

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Consulting Engineers
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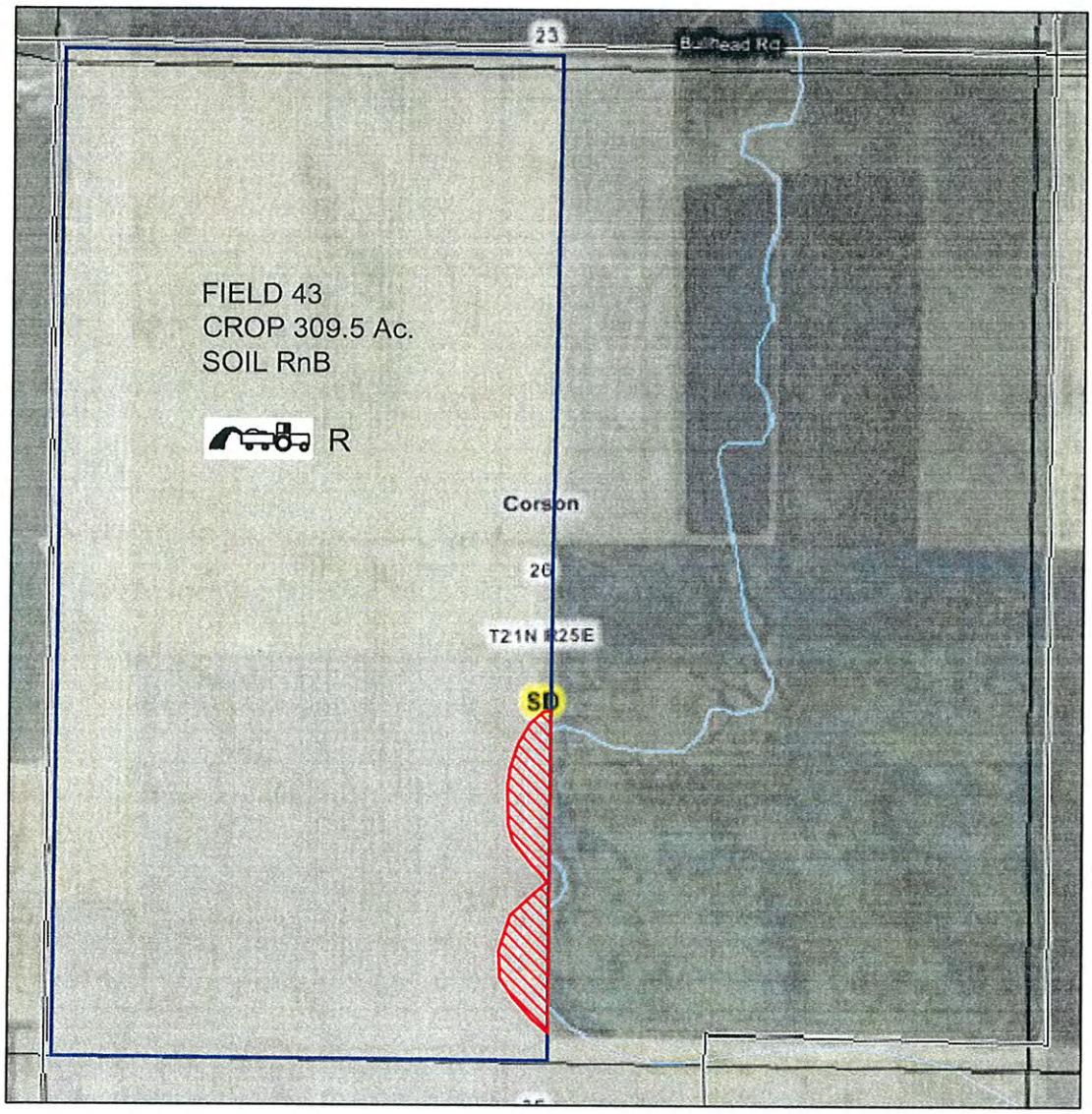

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

26 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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Date:	12/28/11	Date:
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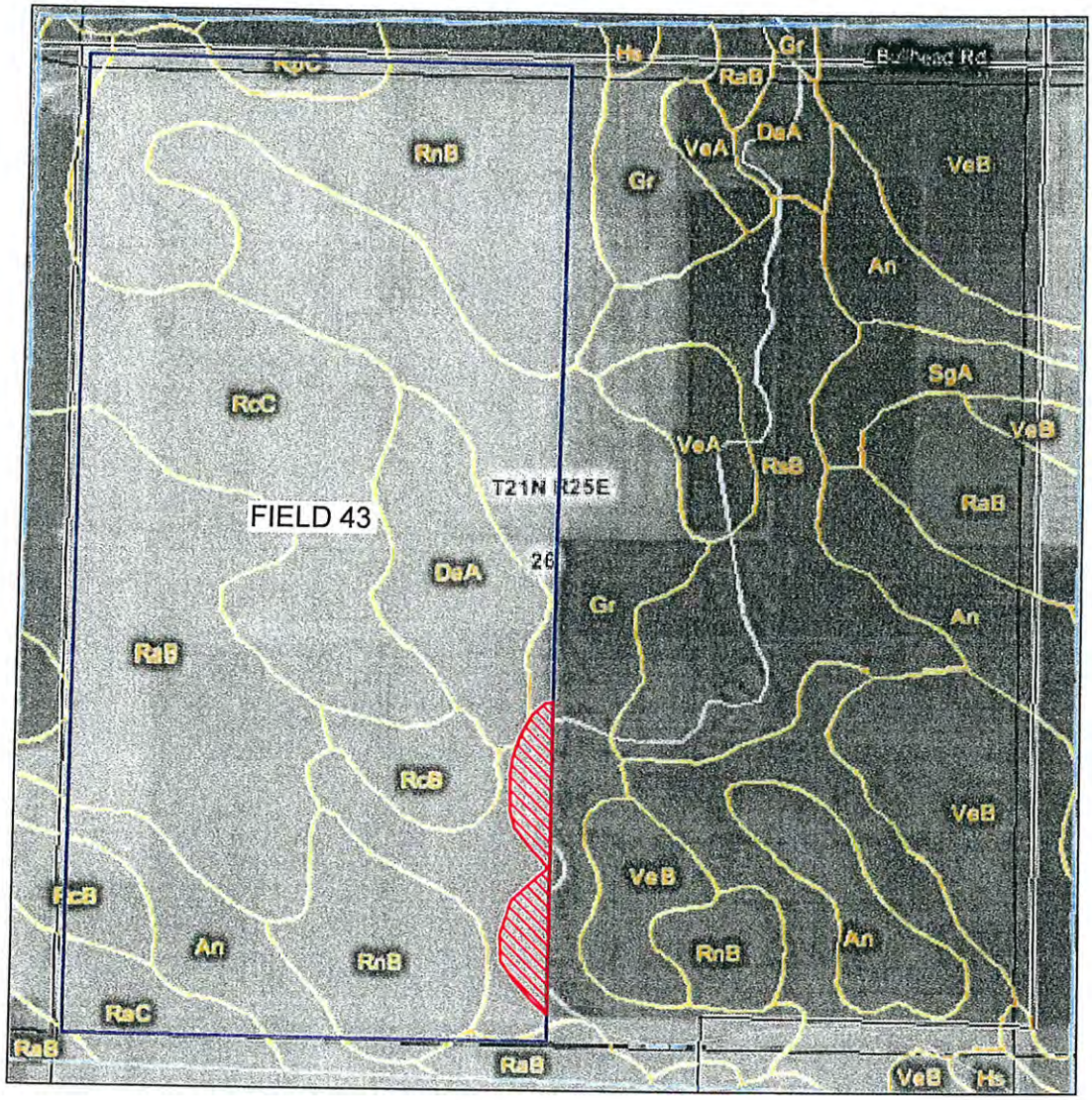

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hg Havrelon loam, channeled
Hs Heil silt loam
RaB Reeder loam, 2 to 6 percent slopes
RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
SgA Savage silt loam, 0 to 3 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

26 - 21N - 25E
CORSON COUNTY, SD

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Consulting Engineers
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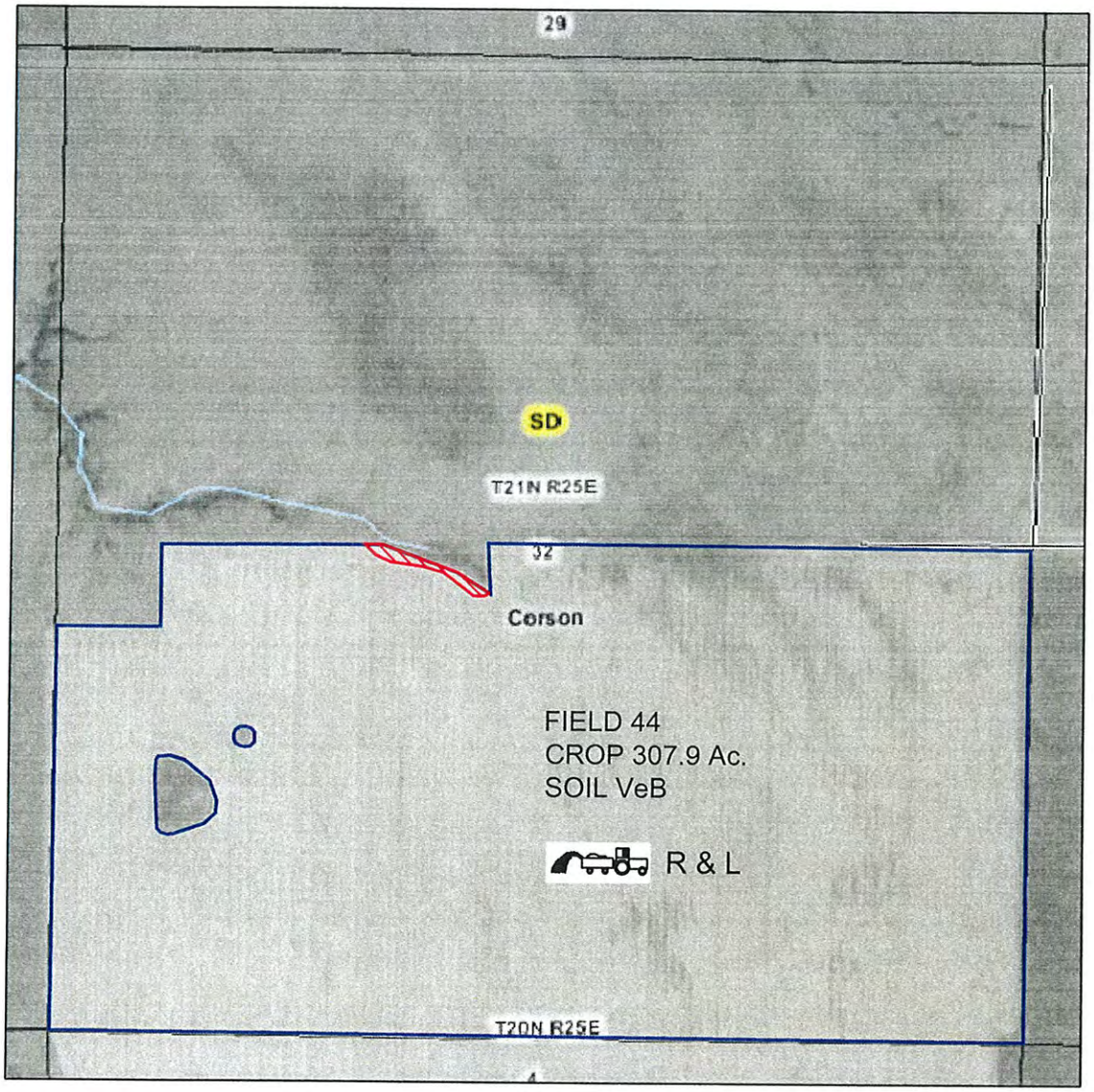

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

32 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers
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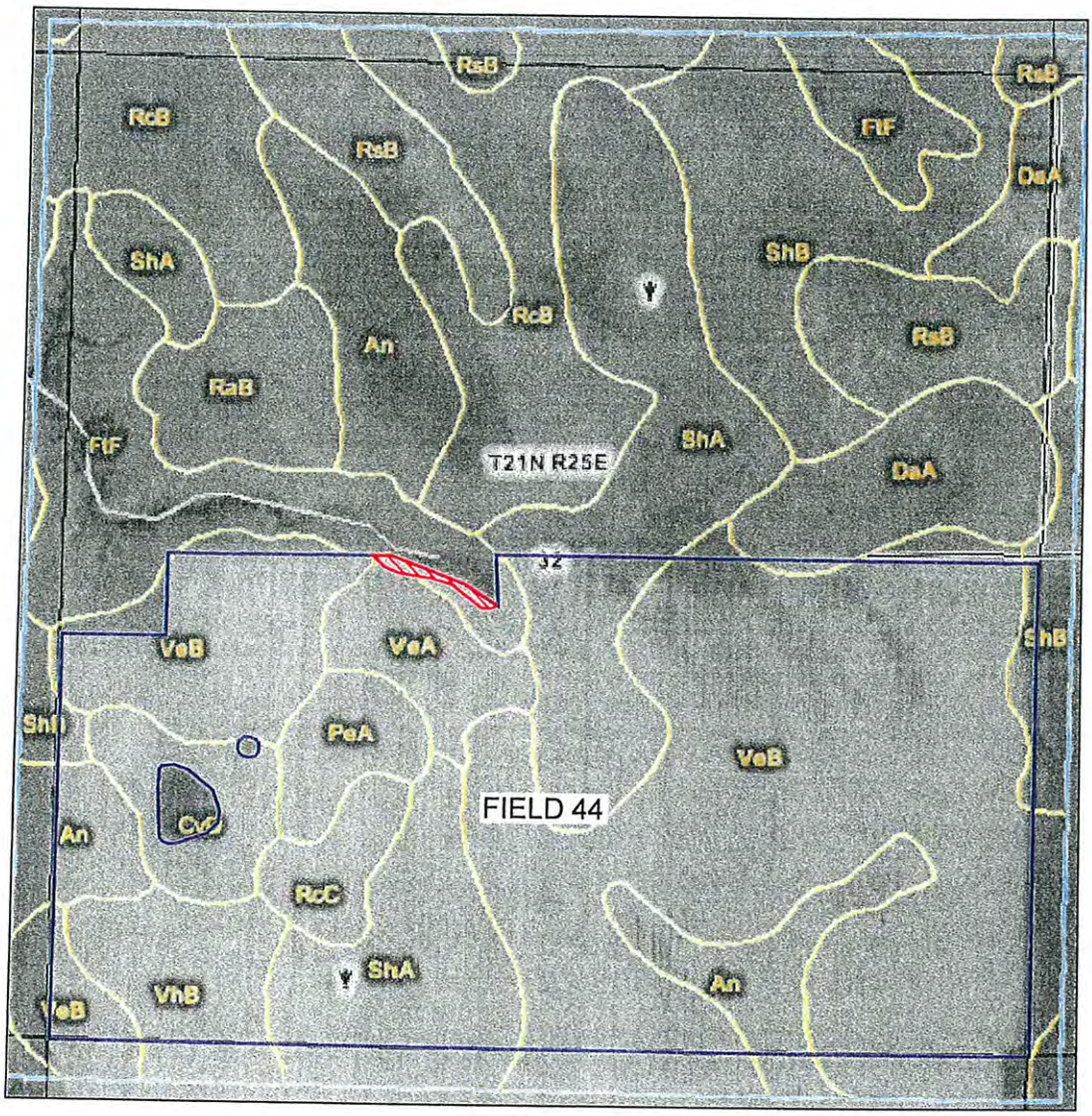

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
CvD Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
FtF Flasher-Telfer complex, 15 to 40 percent slopes
PeA Parshall fine sandy loam, 0 to 6 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
ShA Shambo loam, 0 to 2 percent slopes
ShB Shambo loam, 2 to 6 percent slopes
VeA Vebar fine sandy loam, 0 to 2 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

32 - 21N - 25E
CORSON COUNTY, SD

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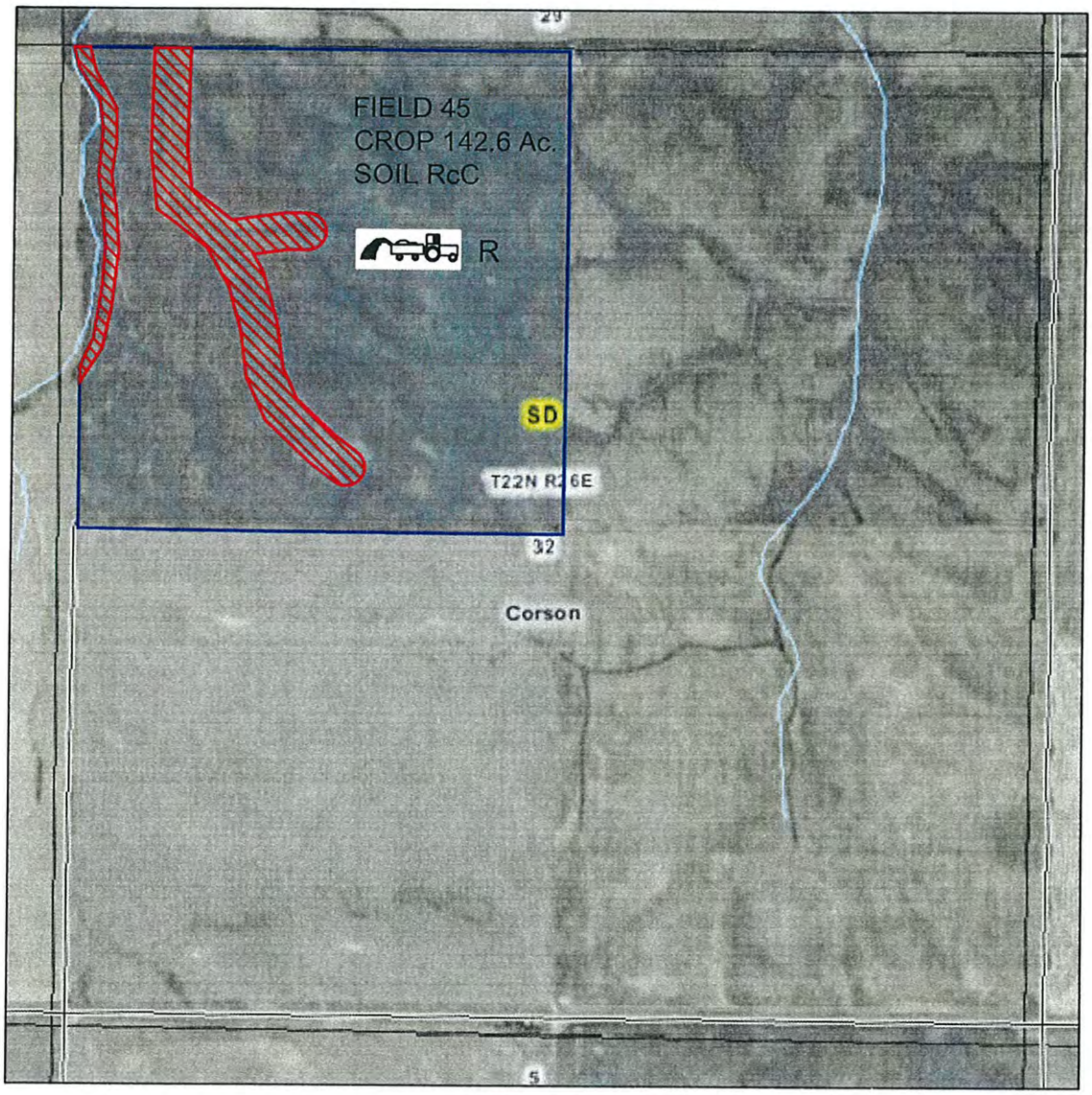

SCALE, FEET

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Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

32 - 22N - 26E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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Date: 12/28/11	Date:
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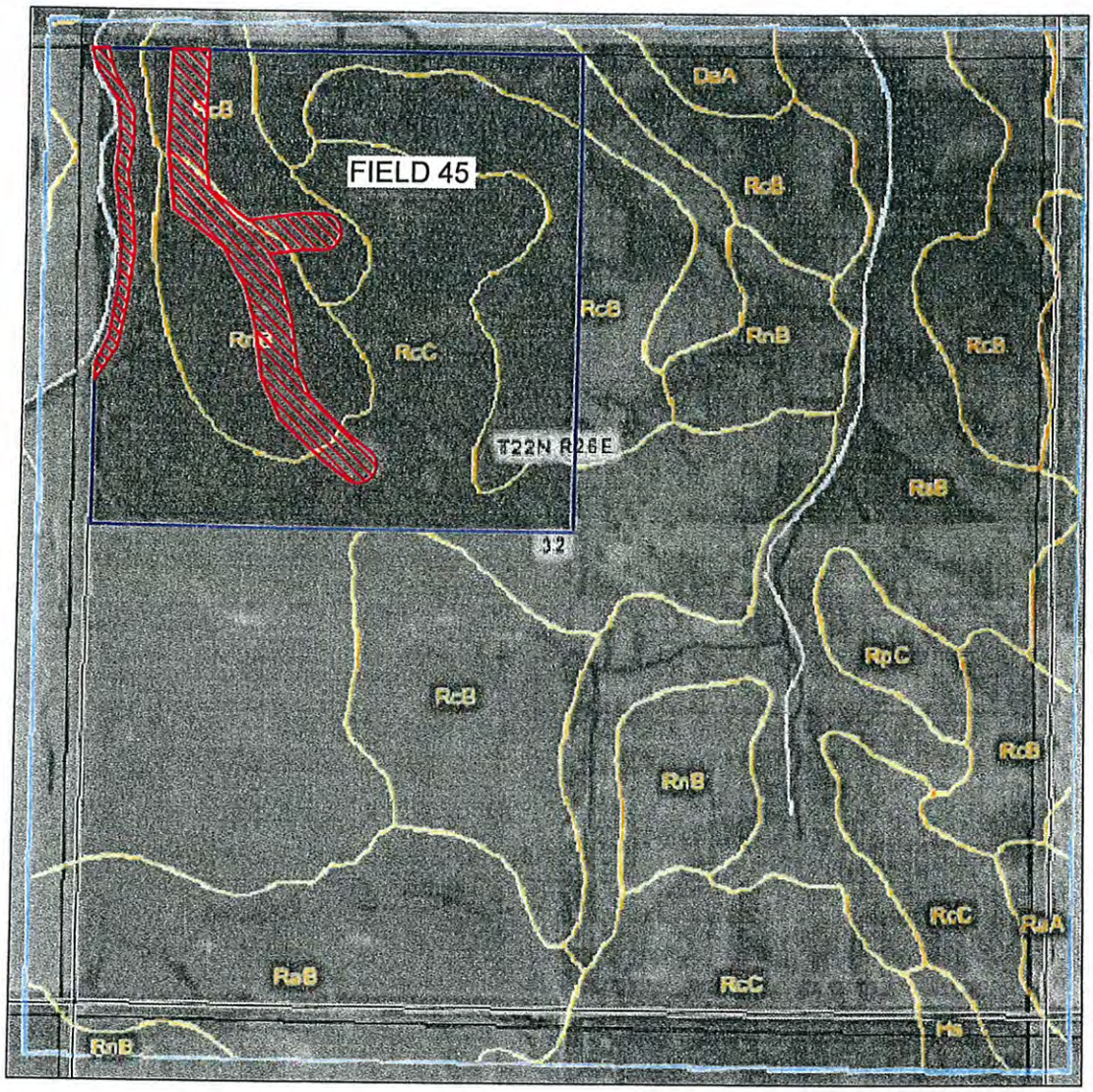

SCALE, FEET

0 500 1000 1500 2000

Legend:

CbD Cabba-Reeder loams, 6 to 25 percent slopes
DaA Daglum loam, 0 to 3 percent slopes
Hs Heil silt loam
RaA Reeder loam, 0 to 2 percent slopes
RaB Reeder loam, 2 to 6 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RpC Regent-Wayden silty clay loams, 6 to 15 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT
SOILS MAP

32 - 22N - 26E
CORSON COUNTY, SD

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Consulting Engineers
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Date:	12/28/11	Date:
Scale:	1" = 1000'	Scale:
Drawn By:	CAS	Drawn By:
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SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

35 - 21N - 25E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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(701) 663-1116, FAX: (701) 667-1356

		Revision
Date:	12/28/11	Date:
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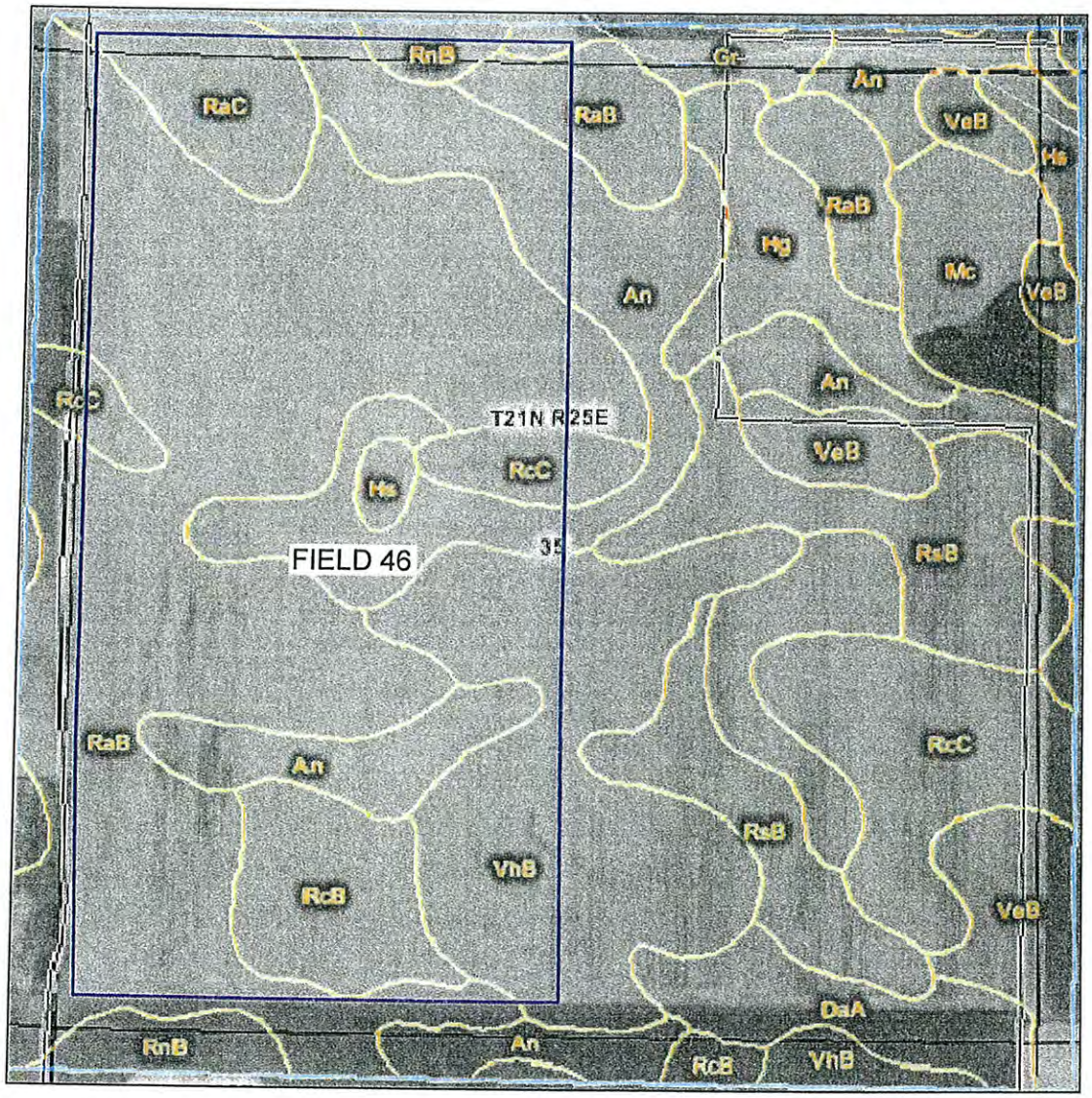

SCALE, FEET

0 500 1000 1500 2000

Legend:

An Arnegard loam
DaA Daglum loam, 0 to 3 percent slopes
Gr Grail silty clay loam
Hg Havrelon loam, channeled
Hs Heil silt loam
Mc McKenzie clay
RaB Reeder loam, 2 to 6 percent slopes
RaC Reeder loam, 6 to 9 percent slopes
RcB Reeder-Cabba loams, 3 to 6 percent slopes
RcC Reeder-Cabba loams, 6 to 9 percent slopes
RnB Regent silty clay loam, 2 to 6 percent slopes
RsB Rhoades-Daglum loams, 0 to 9 percent slopes
VeB Vebar fine sandy loam, 2 to 6 percent slopes
VhB Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

35 - 21N - 25E
CORSON COUNTY, SD

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Date: 12/28/11	Date:
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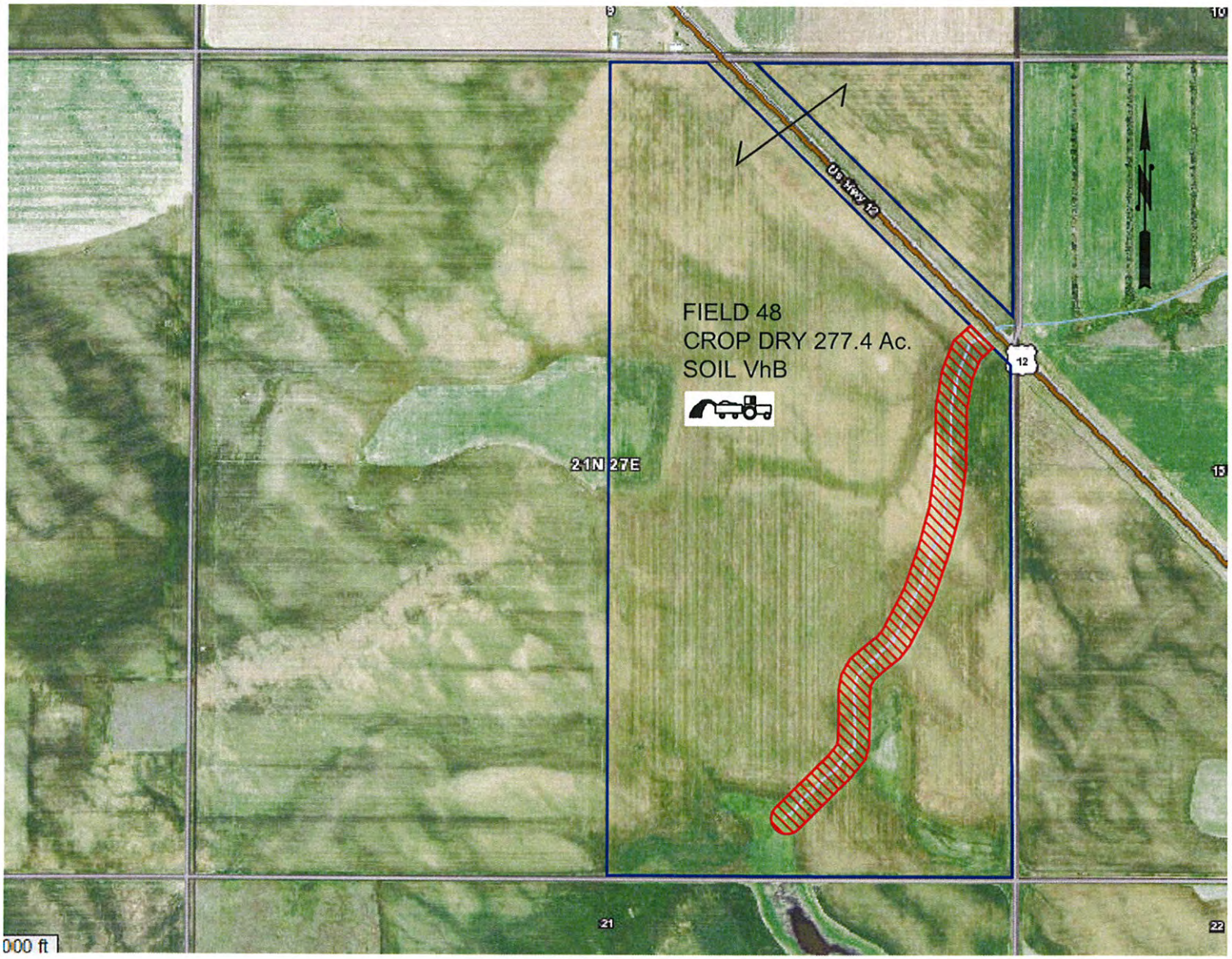

SCALE, FEET

0 500 1000 1500 2000

Setback and/or Exclusion Area

Manure Application

Manure Application Fields

Land Application Area

R RUNOFF - High Risk

L LEACHING - High Risk

WULF CATTLE DEPOT

WATER QUALITY RISK ASSESSMENT MAP

16 - 21N - 27E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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(701) 663-1116, FAX: (701) 667-1356

		Revision	
Date:	5/23/13	Date:	5/23/13
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Checked By:	GGG	Checked By:	GGG
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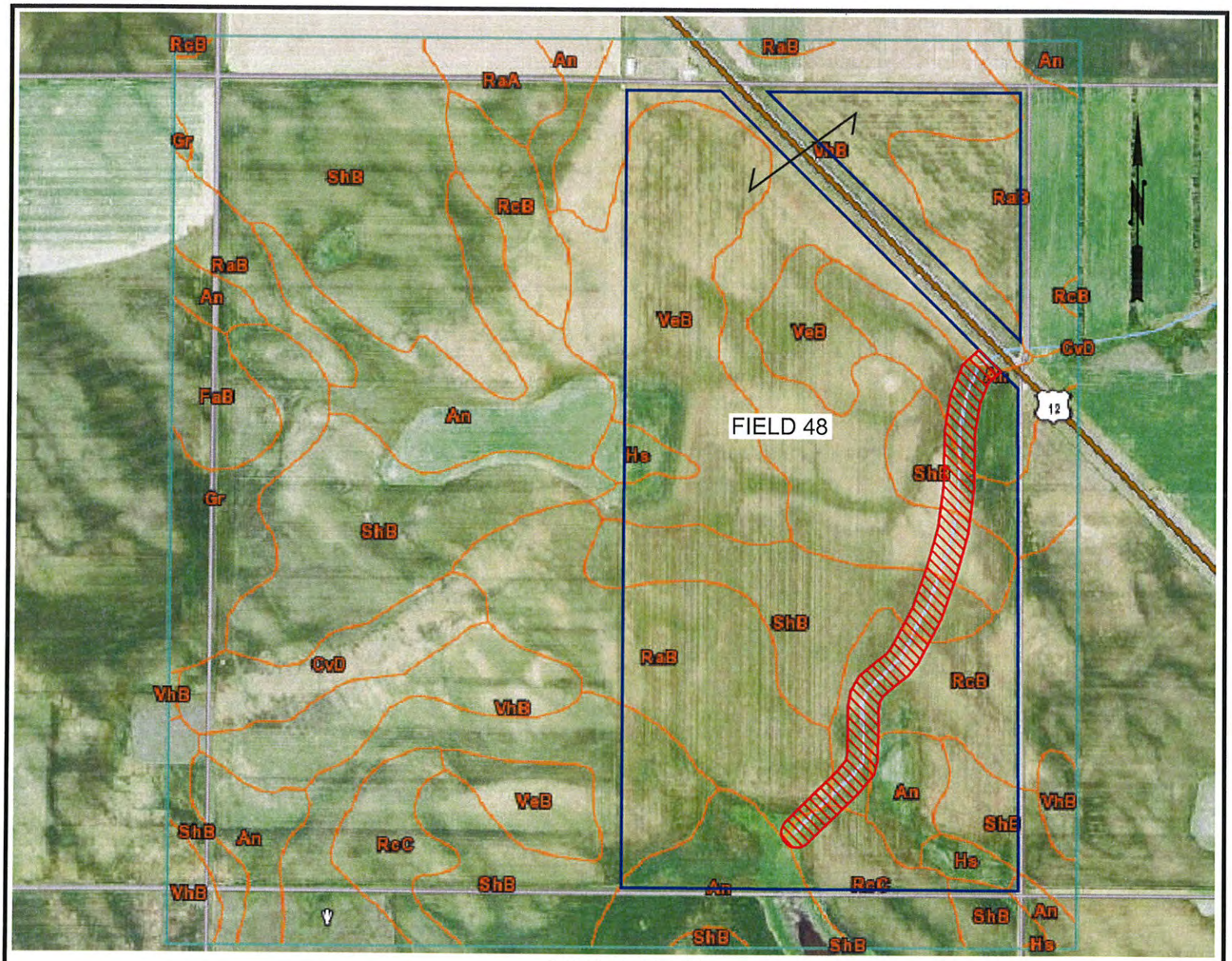

SCALE, FEET

0 500 1000 1500 2000

Legend:

An	Arnegard loam
CvD	Cohagen-Vebar fine sandy loams, 6 to 25 percent slopes
FaB	Farnuf loam, 2 to 6 percent slopes
Gr	Grail silty clay loam
Hs	Heil silt loam
RaA	Reeder loam, 0 to 2 percent slopes
RaB	Reeder loam, 2 to 6 percent slopes
RcB	Reeder-Cabba loams, 3 to 6 percent slopes
RcC	Reeder-Cabba loams, 6 to 9 percent slopes
ShB	Shambo loam, 2 to 6 percent slopes
VeB	Vebar fine sandy loam, 2 to 6 percent slopes
VhB	Vebar-Cohagen fine sandy loams, 2 to 9 percent slopes

Land Application Area

WULF CATTLE DEPOT

SOILS MAP

16 - 21N - 27E
CORSON COUNTY, SD

DeHaan, Grabs & Associates, LLC
Consulting Engineers

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		Revision
Date:	5/23/13	Date:
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Drawn By:	CAS	Drawn By:
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Page:		Page:

Section G: Crop Yield Documentation

Corson County Crop Yields

For Nutrient Management Planning, add 10% to yield goals.

Map Unit	SoilDescription	Prod Index	Corn - Grain		Corn Silage		Soy-beans	Grain Sorghum	Spring Wheat	Winter Wheat	Oats	Barley	Sun flowers	Hay	Alfalfa
			Dry	Irr	Dry	Irr									
	Crop yields based on 2005 - 09 South Dakota Agricultural Statistics:		68	134	7	15	18	32	26	36	55	31	1,656	1.5	1.3
	County Average Crop Soil Map Unit Productivity Index =	57.3													
An	ARNEGARD LOAM	94	111	220	11	24	30	52	42	59	91	50	2,716	2.4	2.2
Bb	BADLAND	1	1	2	0	0	0	1	0	1	1	1	29	0.0	0.0
Bd	BANKS FINE SAND	25	30	58	3	6	8	14	11	16	24	13	722	0.6	0.6
BeA	BELFIELD-DAGLUM COMPLEX, 0 TO 3 PERCENT SLOPES	62	73	145	7	16	20	34	28	39	60	33	1,791	1.6	1.4
BfA	BRYANT SILT LOAM, 0 TO 2 PERCENT SLOPES	93	110	217	11	24	29	51	41	58	90	50	2,687	2.4	2.1
BfB	BRYANT SILT LOAM, 2 TO 6 PERCENT SLOPES	86	102	201	10	22	27	47	38	54	83	46	2,485	2.2	2.0
BgB	BRYANT-SUTLEY SILT LOAMS, 2 TO 6 PERCENT SLOPES	77	91	180	9	20	24	42	34	48	74	41	2,225	2.0	1.8
BgC	BRYANT-SUTLEY SILT LOAMS, 6 TO 9 PERCENT SLOPES	67	79	157	8	17	21	37	30	42	65	36	1,936	1.7	1.5
BlA	BULLCREEK CLAY, 0 TO 4 PERCENT SLOPES	8	9	19	1	2	3	4	4	5	8	4	231	0.2	0.2
BmA	BULLCREEK-SLICKSPOTS COMPLEX, 0 TO 4 PERCENT SLOPES	7	8	16	1	2	2	4	3	4	7	4	202	0.2	0.2
BnA	BULLOCK FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	10	12	23	1	3	3	6	4	6	10	5	289	0.3	0.2
BrB	BULLOCK-PARCHIN FINE SANDY LOAMS, 0 TO 9 PERCENT SLOPES	20	24	47	2	5	6	11	9	13	19	11	578	0.5	0.5
BsB	BULLOCK-PARCHIN-SLICKSPOTS COMPLEX, 0 TO 9 PERCENT SLOPES	18	21	42	2	5	6	10	8	11	17	10	520	0.5	0.4
BuB	BULLOCK-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES	8	9	19	1	2	3	4	4	5	8	4	231	0.2	0.2
BvE	BULLOCK-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOP	5	6	12	1	1	2	3	2	3	5	3	144	0.1	0.1
BzB	BULLOCK-TELFER-PARCHIN COMPLEX, 0 TO 9 PERCENT SLOPES	19	23	44	2	5	6	10	8	12	18	10	549	0.5	0.4
CaF	CABBA-AMOR LOAMS, 15 TO 60 PERCENT SLOPES	17	20	40	2	4	5	9	8	11	16	9	491	0.4	0.4
CbD	CABBA-REEDER LOAMS, 6 TO 25 PERCENT SLOPES	22	26	51	3	6	7	12	10	14	21	12	636	0.6	0.5
CeE	CABBA-SHAMBO LOAMS, 6 TO 40 PERCENT SLOPES	13	15	30	2	3	4	7	6	8	13	7	376	0.3	0.3
CgF	COHAGEN-CABBA-ROCK OUTCROP COMPLEX, 6 TO 70 PERCENT SLOPES	7	8	16	1	2	2	4	3	4	7	4	202	0.2	0.2
CvD	COHAGEN-VEBAR FINE SANDY LOAMS, 6 TO 25 PERCENT SLOPES	24	28	56	3	6	8	13	11	15	23	13	693	0.6	0.6
DaA	DAGLUM LOAM, 0 TO 3 PERCENT SLOPES	39	46	91	5	10	12	21	17	24	38	21	1,127	1.0	0.9
DuD	DUPREE-ROCK OUTCROP COMPLEX, 6 TO 30 PERCENT SLOPES	4	5	9	0	1	1	2	2	3	4	2	116	0.1	0.1
EkA	EKALAKA VERY FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	31	37	72	4	8	10	17	14	19	30	17	896	0.8	0.7
EpB	EKALAKA-PARSHALL COMPLEX, 0 TO 6 PERCENT SLOPES	36	43	84	4	9	11	20	16	23	35	19	1,040	0.9	0.8
EvB	EVRIDGE FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	27	32	63	3	7	9	15	12	17	26	14	780	0.7	0.6
EwB	EVRIDGE-BULLOCK FINE SANDY LOAMS, 0 TO 6 PERCENT SLOPES	20	24	47	2	5	6	11	9	13	19	11	578	0.5	0.5
ExB	EVRIDGE-PARCHIN FINE SANDY LOAMS, 0 TO 6 PERCENT SLOPES	26	31	61	3	7	8	14	12	16	25	14	751	0.7	0.6
FaA	FARNUF LOAM, 0 TO 2 PERCENT SLOPES	84	100	196	10	22	26	46	37	53	81	45	2,427	2.2	1.9
FaB	FARNUF LOAM, 2 TO 6 PERCENT SLOPES	79	94	185	9	20	25	43	35	49	76	42	2,282	2.0	1.8
FrF	FLASHER-ROCK OUTCROP COMPLEX, 30 TO 60 PERCENT SLOPES	2	2	5	0	1	1	1	1	1	2	1	58	0.1	0.0
FtF	FLASHER-TELFER COMPLEX, 15 TO 40 PERCENT SLOPES	5	6	12	1	1	2	3	2	3	5	3	144	0.1	0.1
Ge	GLENROSS FINE SANDY LOAM	30	36	70	4	8	9	17	13	19	29	16	867	0.8	0.7
Gk	GLENROSS-EKALAKA FINE SANDY LOAMS	33	39	77	4	8	10	18	15	21	32	18	953	0.9	0.8
Gr	GRAIL SILTY CLAY LOAM	92	109	215	11	24	29	51	41	58	89	49	2,658	2.4	2.1
Gs	GRASSNA SILT LOAM	97	115	227	12	25	31	53	43	61	94	52	2,803	2.5	2.2
Hd	HARRIET LOAM	7	8	16	1	2	2	4	3	4	7	4	202	0.2	0.2
Hf	HAVRELON LOAM	73	87	171	9	19	23	40	33	46	71	39	2,109	1.9	1.7

Corson County Crop Yields

For Nutrient Management Planning, add 10% to yield goals.

Map Unit	SoilDescription	Prod Index	Corn - Grain		Corn Silage		Soy-beans	Grain Sorghum	Spring Wheat	Winter Wheat	Oats	Barley	Sun flowers	Hay	Alfalfa
			Dry	Irr	Dry	Irr									
Hg	HAVRELON LOAM, CHANNELED	29	34	68	3	7	9	16	13	18	28	15	838	0.7	0.7
Hn	HAVRELON LOAM, TERRACE	76	90	178	9	19	24	42	34	48	73	41	2,196	2.0	1.8
HrA	HAVRELON-RHOADES LOAMS, 0 TO 4 PERCENT SLOPES	49	58	115	6	13	15	27	22	31	47	26	1,416	1.3	1.1
Hs	HEIL SILT LOAM	15	18	35	2	4	5	8	7	9	15	8	433	0.4	0.3
HuB	HURLEY SILT LOAM, 0 TO 9 PERCENT SLOPES	10	12	23	1	3	3	6	4	6	10	5	289	0.3	0.2
HwA	HURLEY-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES	15	18	35	2	4	5	8	7	9	15	8	433	0.4	0.3
JrF	JANESBURG-REGENT-CABBA COMPLEX, 9 TO 35 PERCENT SLOPES	26	31	61	3	7	8	14	12	16	25	14	751	0.7	0.6
Ka	KORCHEA LOAM	73	87	171	9	19	23	40	33	46	71	39	2,109	1.9	1.7
Kc	KORCHEA LOAM, CHANNELED	30	36	70	4	8	9	17	13	19	29	16	867	0.8	0.7
La	LALLIE SILTY CLAY LOAM	23	27	54	3	6	7	13	10	14	22	12	665	0.6	0.5
LeA	LEHR LOAM, 0 TO 2 PERCENT SLOPES	43	51	100	5	11	14	24	19	27	42	23	1,242	1.1	1.0
LeB	LEHR LOAM, 2 TO 6 PERCENT SLOPES	40	47	93	5	10	13	22	18	25	39	21	1,156	1.0	0.9
Mc	MCKENZIE CLAY	27	32	63	3	7	9	15	12	17	26	14	780	0.7	0.6
M-W	MISCELLANEOUS WATER	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
OaB	OPAL CLAY, 2 TO 6 PERCENT SLOPES	56	66	131	7	14	18	31	25	35	54	30	1,618	1.4	1.3
OaC	OPAL CLAY, 6 TO 9 PERCENT SLOPES	48	57	112	6	12	15	26	21	30	46	26	1,387	1.2	1.1
OdC	OPAL-DUPREE CLAYS, 2 TO 9 PERCENT SLOPES	32	38	75	4	8	10	18	14	20	31	17	925	0.8	0.7
OhB	OPAL-HURLEY COMPLEX, 0 TO 9 PERCENT SLOPES	39	46	91	5	10	12	21	17	24	38	21	1,127	1.0	0.9
OsC	OPAL-SANSARC CLAYS, 6 TO 15 PERCENT SLOPES	27	32	63	3	7	9	15	12	17	26	14	780	0.7	0.6
PaB	PARCHIN FINE SANDY LOAM, 0 TO 9 PERCENT SLOPES	28	33	65	3	7	9	15	12	18	27	15	809	0.7	0.6
PdD	PARCHIN-BULLOCK-CABBA COMPLEX, 6 TO 30 PERCENT SLOPES	10	12	23	1	3	3	6	4	6	10	5	289	0.3	0.2
PeA	PARSHALL FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	61	72	143	7	16	19	34	27	38	59	33	1,762	1.6	1.4
Pg	PITS, GRAVEL	1	1	2	0	0	0	1	0	1	1	1	29	0.0	0.0
PrA	PROMISE CLAY, 0 TO 2 PERCENT SLOPES	72	85	168	9	18	23	40	32	45	70	38	2,080	1.9	1.7
PrB	PROMISE CLAY, 2 TO 6 PERCENT SLOPES	64	76	150	8	16	20	35	29	40	62	34	1,849	1.6	1.5
RaA	REEDER LOAM, 0 TO 2 PERCENT SLOPES	84	100	196	10	22	26	46	37	53	81	45	2,427	2.2	1.9
RaB	REEDER LOAM, 2 TO 6 PERCENT SLOPES	79	94	185	9	20	25	43	35	49	76	42	2,282	2.0	1.8
RaC	REEDER LOAM, 6 TO 9 PERCENT SLOPES	60	71	140	7	15	19	33	27	38	58	32	1,734	1.5	1.4
RcB	REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES	64	76	150	8	16	20	35	29	40	62	34	1,849	1.6	1.5
RcC	REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES	50	59	117	6	13	16	28	22	31	48	27	1,445	1.3	1.2
RhB	REEDER-RHOADES LOAMS, 2 TO 9 PERCENT SLOPES	48	57	112	6	12	15	26	21	30	46	26	1,387	1.2	1.1
RnA	REGENT SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES	65	77	152	8	17	20	36	29	41	63	35	1,878	1.7	1.5
RnB	REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES	60	71	140	7	15	19	33	27	38	58	32	1,734	1.5	1.4
RpC	REGENT-WAYDEN SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES	35	41	82	4	9	11	19	16	22	34	19	1,011	0.9	0.8
RrA	RHOADES LOAM, 0 TO 6 PERCENT SLOPES	12	14	28	1	3	4	7	5	8	12	6	347	0.3	0.3
RsB	RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES	22	26	51	3	6	7	12	10	14	21	12	636	0.6	0.5
RtB	RHOADES-DAGLUM-SLICKSPOTS COMPLEX, 0 TO 9 PERCENT SLOPES	20	24	47	2	5	6	11	9	13	19	11	578	0.5	0.5
RuB	RHOADES-SLICKSPOTS COMPLEX, 0 TO 6 PERCENT SLOPES	15	18	35	2	4	5	8	7	9	15	8	433	0.4	0.3
RvE	RHOADES-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 40 PERCENT SLOP	6	7	14	1	2	2	3	3	4	6	3	173	0.2	0.1
RzF	ROCK OUTCROP-CABBA COMPLEX, 6 TO 40 PERCENT SLOPES	4	5	9	0	1	1	2	2	3	4	2	116	0.1	0.1

Corson County Crop Yields

For Nutrient Management Planning, add 10% to yield goals.

Map Unit	SoilDescription	Prod Index	Corn - Grain		Corn Silage		Soy-beans	Grain Sorghum	Spring Wheat	Winter Wheat	Oats	Barley	Sun flowers	Hay	Alfalfa
			Dry	Irr	Dry	Irr									
SbE	SANSARC-OPAL CLAYS, 15 TO 40 PERCENT SLOPES	8	9	19	1	2	3	4	4	5	8	4	231	0.2	0.2
SdD	SANSARC-OPAL-DUPREE CLAYS, 9 TO 25 PERCENT SLOPES	11	13	26	1	3	3	6	5	7	11	6	318	0.3	0.3
SeE	SANSARC-WABEK COMPLEX, 15 TO 40 PERCENT SLOPES	6	7	14	1	2	2	3	3	4	6	3	173	0.2	0.1
SgA	SAVAGE SILT LOAM, 0 TO 3 PERCENT SLOPES	85	101	199	10	22	27	47	38	53	82	45	2,456	2.2	2.0
SgB	SAVAGE SILT LOAM, 3 TO 6 PERCENT SLOPES	80	95	187	10	20	25	44	36	50	77	43	2,311	2.1	1.8
ShA	SHAMBO LOAM, 0 TO 2 PERCENT SLOPES	83	98	194	10	21	26	46	37	52	80	44	2,398	2.1	1.9
ShB	SHAMBO LOAM, 2 TO 6 PERCENT SLOPES	78	92	182	9	20	25	43	35	49	75	42	2,254	2.0	1.8
ShC	SHAMBO LOAM, 6 TO 9 PERCENT SLOPES	62	73	145	7	16	20	34	28	39	60	33	1,791	1.6	1.4
StA	STADY LOAM, 0 TO 2 PERCENT SLOPES	55	65	129	7	14	17	30	25	34	53	29	1,589	1.4	1.3
StB	STADY LOAM, 2 TO 6 PERCENT SLOPES	49	58	115	6	13	15	27	22	31	47	26	1,416	1.3	1.1
TaA	TALLY FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES	54	64	126	6	14	17	30	24	34	52	29	1,560	1.4	1.2
TdA	TELFER LOAMY SAND, 0 TO 6 PERCENT SLOPES	30	36	70	4	8	9	17	13	19	29	16	867	0.8	0.7
TeB	TELFER-EKALAKA COMPLEX, 0 TO 6 PERCENT SLOPES	26	31	61	3	7	8	14	12	16	25	14	751	0.7	0.6
Th	TREMBLES FINE SANDY LOAM	43	51	100	5	11	14	24	19	27	42	23	1,242	1.1	1.0
Tm	TREMBLES FINE SANDY LOAM, CHANNELED	32	38	75	4	8	10	18	14	20	31	17	925	0.8	0.7
Tt	TREMBLES FINE SANDY LOAM, TERRACE	46	55	108	5	12	15	25	21	29	44	25	1,329	1.2	1.1
VeA	VEBAR FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES	58	69	136	7	15	18	32	26	36	56	31	1,676	1.5	1.3
VeB	VEBAR FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	51	60	119	6	13	16	28	23	32	49	27	1,473	1.3	1.2
VhB	VEBAR-COHAGEN FINE SANDY LOAMS, 2 TO 9 PERCENT SLOPES	43	51	100	5	11	14	24	19	27	42	23	1,242	1.1	1.0
W	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
WaD	WABEK GRAVELLY SANDY LOAM, 2 TO 35 PERCENT SLOPES	3	4	7	0	1	1	2	1	2	3	2	87	0.1	0.1
WcE	WAYDEN-CABBA COMPLEX, 9 TO 40 PERCENT SLOPES	8	9	19	1	2	3	4	4	5	8	4	231	0.2	0.2
WdE	WAYDEN AND CABBA SOILS, 6 TO 40 PERCENT SLOPES, EXTREMELY STONY	6	7	14	1	2	2	3	3	4	6	3	173	0.2	0.1
Wt	WENDTE SILTY CLAY, CHANNELED	29	34	68	3	7	9	16	13	18	28	15	838	0.7	0.7
ZeB	ZEONA LOAMY FINE SAND, 0 TO 6 PERCENT SLOPES	28	33	65	3	7	9	15	12	18	27	15	809	0.7	0.6
ZsD	ZEONA-SLICKSPOTS-ROCK OUTCROP COMPLEX, 0 TO 30 PERCENT SLOPES	16	19	37	2	4	5	9	7	10	15	9	462	0.4	0.4

Section H: Signed Manure Application Lease Agreements

Space Above Is for Recording Information

MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made **December 30, 2010,** by and between **Golden Hills, LLP** (Land Owners hereinafter "Grantor") and **Wulf Cattle Co., LLP** (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

E1/2NW1/4 and NE1/4 Sec. 7 T21N R26E of Black Hills Meridian Field 33, 34
SW1/4 Sec. 12 T21N R25E of Black Hills Meridian Field 38
W1/2 and SE1/4 Sec. 10 T21N R25E of Black Hills Meridian Field 35 36
S1/2 Sec. 11 T21N R25E of Black Hills Meridian Field 37

Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: All of that part of the S1/2NE1/4
Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the
NW1/4 of Section 5, Township 21 North, Range 27 East of
Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition.
Together with an easement of right of way on, over and across Tract 1
McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- Easement To Apply Livestock Bio-Solids: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of **15** years unless terminated earlier by mutual agreement

between the parties.

- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenent and agree that:
  - A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account waather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such manure application.
  - B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
  - C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions mada by Grantor with raspect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.
  - D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-solids application and egreas to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
  - E. Nothing in this agraement shall require Grantee to apply manure and other livestock bio-solids to the Property.
  - F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to tha Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.
  - G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.
- Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, eny additional state or county permit forms that may be required.
- Termination [Optional]: If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock bio-solids. If replacament property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:

X Dennis Wulf
Dennis Wulf, as Trustee of the Dennis & Judy Wulf Livng Trust dated April 3, 2003, General Partner

X Jeral L Wulf
Jeral L. Wulf, as Trustee of the Jeral L. and Linda L. Wulf Living Trust dated April 22, 2003, General Partner

X _____

X _____

X _____

X _____

GRANTEES:

X Jeral Wulf
Jeral L. Wulf, Operations Management Partner

X Dennis Wulf
Dennis Wulf, Financial Matters Partner

X _____ X _____

X _____ X _____

ACKNOWLEDGEMENTS

STATE OF _____)
) ss. **(Individual)**
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, _____ by _____.

_____
Notary Public _____
My commission expires: _____

STATE OF Minnesota)
) ss. **(Partnership)**
COUNTY OF Stevens)

The foregoing instrument was acknowledged before me this 27 day of December, 2010 by Jeral L Wulf, partner(s), on behalf of Golden Hills LLP, a partnership.

_____
Notary Public _____
My commission expires: 1-31-2015

STATE OF Minnesota)
) ss. ~~(Corporation)~~ Partner
COUNTY OF Stevens)

DENNIS L. SLEITER
NOTARY PUBLIC-MINNESOTA
My Comm. Exp. Jan. 31, 2015

The foregoing instrument was acknowledged before me this 27 day of December, 2010 by Dennis Wulf as partner of _____, a _____ corporation, on behalf of the corporation.

_____
Notary Public _____
My commission expires: 1-31-2015

DENNIS L. SLEITER
NOTARY PUBLIC-MINNESOTA
My Comm. Exp. Jan. 31, 2015

This instrument was drafted by:
AgCountry Farm Credit Services
102 S. Atlantic Ave
Morris, MN 56267

Space Above is for Recording Information

MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made **December 30, 2010,** by and between **Dallas Schott and Dee Schott** (Land Owners hereinafter "Grantor") and **Wulf Cattle Co., LLP** (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

S1/2SE1/4 Sec. 6 T21N R27E of Black Hills Meridian Field 7-8
W1/2 Sec. 7 T21N R27E of Black Hills Meridian Field 9
NW1/4 Sec. 8 T21N R27E of Black Hills Meridian Field 10
NE1/4 Sec. 8 T21N R27E of Black Hills Meridian Field 11
SE1/4 Sec. 9 T22N R27Eof Black Hills Meridian Field 13
NE1/4 Sec. 9 T22N R27E of Black Hills Meridian Field 14
E1/2 Sec. 10 T22N R27E of Black Hills Meridian Field 16
N1/2 Sec. 15 T22N R27E of Black Hills Meridian Field 18-19
E1/2 Sec. 16 T22N R27E of Black Hills Meridian Field 20
NE1/4 Sec. 9 T21N R27E of Black Hills Meridian Field 12
SW1/4 Sec. 9 T21N R27E of Black Hills Meridian Field 13
E1/2 Sec. 14 T21N R25E of Black Hills Meridian Field 39
NE1/4 Sec. 23 T21N R25E of Black Hills Meridian Field 40
S1/2 Sec. 32 T21N R25E of Black Hills Meridian Field 44
N1/2 Sec. 4 T20N R25E of Black Hills Meridian Field 29
W1/2 Sec. 26 T21N R25E of Black Hills Meridian Field 43
W1/2 Sec. 35 T21N R25E of Black Hills Meridian Field 46

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: All of that part of the S1/2NE1/4
Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the
NW1/4 of Section 5, Township 21 North, Range 27 East of
Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition.
Together with an easement of right of way on, over and across Tract 1
McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such

Grantor and Grantee hereby agree as follows:

- Easement To Apply Livestock Bio-Solids: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and agree that:
  - A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such manure application.
  - B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
  - C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.
  - D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
  - E. Nothing in this agreement shall require Grantee to apply manure and other livestock bio-solids to the Property.
  - F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.
  - G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.
- Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county permit forms that may be required.
- Termination (Optional): If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock bio-solids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:

X Dallas Schott — X Dee Schott

Dallas Schott — **Dee Schott**

X _____ — X _____

X _____ — X _____

GRANTEES:

X Jeral J Wulf Operations mgmt Partner X _____

Jeral J. Wulf, Operations Management Partner

X Dennis Wulf FMP X _____

Dennis Wulf, Financial Matters Partner

X _____ X _____

ACKNOWLEDGEMENTS

STATE OF South Dakota)

COUNTY OF Corson) ss. (Individual)

The foregoing instrument was acknowledged before me this 28 day of December 2010 by Dallas Schott and Dee Schott

Notary Public _____

My commission expires: 5-2-13

STATE OF Minnesota)

COUNTY OF Stevens) ss. (Partnership)

The foregoing instrument was acknowledged before me this 4 day of January 2011 by Jeral Wulf & Dennis Wulf, partner(s), on behalf of Wulf Cattle Co LLP, a partnership.

DENNIS L. SLEITER
NOTARY PUBLIC-MINNESOTA
My Comm. Exp. Jan. 31, 2015

Notary Public _____

My commission expires: 1-31-2015

STATE OF _____)

COUNTY OF _____) ss. (Corporation)

The foregoing instrument was acknowledged before me this _____ day of _____, _____ by _____ as _____ of _____, a _____ corporation, on behalf of the corporation.

Notary Public _____

My commission expires: _____

This instrument was drafted by:
AgCountry Farm Credit Services
102 S. Atlantic Ave
Morris, MN 56267

Space Above is for Recording Information

MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made **December 30, 2010,** by and between **Gary Rau** (Land Owners hereinafter "Grantor") and **Wulf Cattle Co., LLP** (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

N1/2N1/2 Sec. 19 T22N R27E of Black Hills Meridian Field 21
SE1/4 Sec. 30 T22N R27E of Black Hills Meridian Field 22
SE1/4 Sec. 31 T22N R27E of Black Hills Meridian Field 24
NE1/4 Sec. 31 T22N R27E of Black Hills Meridian Field 23
NW1/4 Sec. 34 T22N R27E of Black Hills Meridian Field 27
NE1/4 Sec. 34 T22N R27E of Black Hills Meridian Field 28

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: All of that part of the S1/2NE1/4
Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the
NW1/4 of Section 5, Township 21 North, Range 27 East of
Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition.
Together with an easement of right of way on, over and across Tract 1
McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- Easement To Apply Livestock Bio-Solids: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first

above written and shall remain in effect for a period of 15 years unless terminated earlier by mutual agreement between the parties.

- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and agree that:
  - A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such manure application.
  - B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
  - C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.
  - D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
  - E. Nothing in this agreement shall require Grantee to apply manure and other livestock bio-solids to the Property.
  - F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.
  - G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.
- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.
- Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county permit forms that may be required.
- Termination (Optional): If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock bio-solids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:

X_____ X_____
Gary Rad

X_____ X_____

X_____ X_____

GRANTEE:

X_____ X_____
Jeral L. Wulf, Operations Management Partner

X Dennis Wulf
Dennis Wulf, Financial Matters Partner

X _____ X _____

X _____ X _____

ACKNOWLEDGEMENTS

STATE OF South Dakota)
) ss. (Individual)
COUNTY OF Corson)

The foregoing instrument was acknowledged before me this 7 day of February, 2011
by Gary Rau

Notary Public _____
My commission expires: 5-2-13

STATE OF Minnesota)
) ss. (Partnership)
COUNTY OF Stevens)

The foregoing instrument was acknowledged before me this 22 day of February, 2011
by Dennis Wulf and Jean Wulf, partner(s), on
behalf of _____, a partnership.

Notary Public _____
My commission expires:

DEANNA L. SLEITER
NOTARY PUBLIC-MINNESOTA
My Comm. Exp. Jan. 31, 2015

STATE OF _____)
) ss. (Corporation)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, _____
by _____, as _____ of
_____, a _____
corporation, on behalf of the corporation.

Notary Public _____
My commission expires: _____

This instrument was drafted by:
AgCountry Farm Credit Services
102 S. Atlantic Ave
Morris, MN 56267

Space Above Is for Recording Information

MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made **December 30, 2010,** by and between **Bonnie Schott** (Land Owners hereinafter "Grantor") and **Wulf Cattle Co., LLP** (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

NW1/4 Sec. 6 T21N R27E of Black Hills Meridian Field 7
SE1/4 Sec. 13 T21N R26E of Black Hills Meridian Field 17
SE1/4 Sec. 24 T21N R26E of Black Hills Meridian Field 41 42

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: All of that part of the S1/2NE1/4
Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the
NW1/4 of Section 5, Township 21 North, Range 27 East of
Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition.
Together with an easement of right of way on, over and across Tract 1
McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regerd to entering into such an agreement and wish to reduce the agreement to writing.

NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein. Grantor and Grantee hereby agree as follows:

- Easement To Apply Livestock Bio-Solids: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of **15** years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and

agree that:

A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such manure application.
B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.
C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.
D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.
E. Nothing in this agreement shall require Grantee to apply manure and other livestock bio-solids to the Property.
F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.
G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.

- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.
- Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county permit forms that may be required.
- Termination (Optional): If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock bio-solids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:

X Bonnie Schott   X____________________
Bonnie Schott

X____________________   X____________________

X____________________   X____________________

GRANTEES:

X Jeral J. Wulf (O.M.P.)   X____________________
Jeral L. Wulf, Operations Management Partner

X Dennis Wulf (FMP)   X____________________
Dennis Wulf, Financial Matters Partner

X____________________   X____________________

ACKNOWLEDGEMENTS

STATE OF South Dakota)
) ss. (Individual)
COUNTY OF Corson)

The foregoing instrument was acknowledged before me this 21 day of January 2011
by Bonnie Schott

Notary Public
My commission expires: 5-2-13

STATE OF Minnesota)
) ss. (Partnership)
COUNTY OF Stearns)

The foregoing instrument was acknowledged before me this 22 day of February 2011
by Dennis Wulf and Jerri Wulf, partner(s), on
behalf of , a partnership.

Notary Public
My commission expires: 1-31-15

DENNIS L. SLEITER
NOTARY PUBLIC - MINNESOTA
My Comm. Exp. Jan. 31, 2015

STATE OF)
) ss. (Corporation)
COUNTY OF)

The foregoing instrument was acknowledged before me this day of ,
by as of
, a
corporation, on behalf of the corporation.

Notary Public
My commission expires:

This instrument was drafted by:
AgCountry Farm Credit Services
102 S. Atlantic Ave
Morris, MN 56267

Space Above is for Recording Information

MANURE EASEMENT AGREEMENT

THIS AGREEMENT is made **December 30, 2010,** by and between **Sharon Walker** (Land Owners hereinafter "Grantor") and **Wulf Cattle Co., LLP** (Borrowers hereinafter "Grantee")

WHEREAS, Grantor is the fee owner of real estate legally described as follows ("Property"):

SW1/4 Sec. 4 T21N R27E of Black Hills Meridian Field 3
SE1/4 Sec. 5 T21N R27E of Black Hills Meridian Field 6
SW1/4 Sec. 5 T21N R27E of Black Hills Meridian Field 5

All in Corson County, SD

WHEREAS, Grantee is the fee owner of real estate legally described as follows ("Facility Site"):

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: All of that part of the S1/2NE1/4
Lying North of the railroad right of way.

Township 21 North, Range 27 East of Black Hills Meridian
Section 5: Lots 1 and 2;

Outlot A, Tract R3 and Tract R5 located in the
NW1/4 of Section 5, Township 21 North, Range 27 East of
Black Hills Meridian, LESS Tract 1 McLaughlin Livestock Addition.
Together with an easement of right of way on, over and across Tract 1
McLaughlin Livestock Addition.

All in Corson County, SD.

WHEREAS, Grantee desires to enter into an agreement with Grantor to haul and apply over the Property manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.

WHEREAS, Grantor will receive the benefit of reduced costs and expenses with regard to fertilizer application on account of such manure application and other related benefits.

WHEREAS, Grantor and Grantee have had mutual discussions with regard to entering into such an agreement and wish to reduce the agreement to writing.

NOW, THEREFORE, in consideration of the premises and under the mutual covenants, promises and conditions set forth herein, Grantor and Grantee hereby agree as follows:

- Easement To Apply Livestock Bio-Solids: Grantor hereby grants to Grantee an easement over the Property for purposes of hauling and applying manure and other livestock bio-solids generated by the livestock facilities located on the Facility Site.
- Term of Agreement: This Agreement and the easements connected herewith shall become effective on the date first above written and shall remain in effect for a period of **15** years unless terminated earlier by mutual agreement between the parties.
- Application of Manure and Other Livestock Bio-solids: The parties hereto agree that Grantee shall be solely responsible for application of the manure and other livestock bio-solids to the Property, and the parties covenant and

agree that:

A. Any and all application of manure and other livestock bio-solids shall be done in a good and husband like manner, taking into account weather conditions, soil conditions and time of year, all so as to reduce any odor that might emanate from such manure application.

B. That the application of manure and other livestock bio-solids shall be done in conformance with state rules and local county zoning ordinances and in accordance with all other applicable permits, statutes, rules and regulations relating to such acts and practices.

C. At all times during the term of this agreement, Grantee will, so far as reasonably practicable, honor all requests and directions made by Grantor with respect to the timing, location and manner of any application of manure and other livestock bio-solids to the soil, and such application shall in no event be done in any way that would interfere with any other right to use, possession and quiet enjoyment of the premises currently owned by Grantor. However, Grantor shall not have the right to prohibit Grantee's application of manure and other livestock bio-solids to the Property. In any calendar year, Grantee shall have the right to apply manure and other livestock bio-solids to the Property in the minimum quantity specified in any applicable manure management plan or, if no such plan exists, at applicable agronomic rates.

D. Grantee is responsible for any claims, causes of action, demands or damages for property loss arising from or on account of its manure and other livestock bio-solids application and agrees to fully indemnify and hold harmless Grantor of and from all such claims. Grantor waives any claims, causes of action, demands or damages for property loss if Grantee's application of manure and other livestock bio-solids is equal to or less than the minimum quantity specified in C above. Any claim by Grantor for property loss will be limited to the value of the crops growing on the Property allegedly damaged by Grantee's action. Grantee shall have no responsibility for any claims, causes of action, demands or damages for personal injury and Grantor waives any claims for personal injury.

E. Nothing in this agreement shall require Grantee to apply manure and other livestock bio-solids to the Property.

F. Other than at the express written consent of Grantee, Grantor will not grant to any other individuals or entities an easement or right to apply manure and other livestock bio-solids to the Property. Other than this easement, Grantor has not granted any other individual or entity an easement or right to apply manure and other livestock bio-solids to the Property.

G. The benefits conferred on the parties described herein constitute reasonably equivalent consideration.

- Successors and Assigns: This Agreement shall inure to the benefit of and be binding upon heirs, successors and assigns of the parties hereto. It is understood by the parties that rights of the Grantee under the terms of this Agreement are fully assignable without the consent of Grantor.
- Execution of Documents: All parties agree to execute any and all additional documents that may be necessary to implement the full terms and conditions of this Agreement, including, but not limited to, any additional state or county permit forms that may be required.
- Termination [Optional]: If Grantor requests cancellation of this Agreement prior to the end of its term, Grantee will exercise reasonable efforts to find replacement property to which Grantee may apply manure and other livestock bio-solids. If replacement property is located and Grantee obtains a manure easement with respect to the same, this Agreement will be terminated.
- Entire Agreement: The foregoing constitutes the entire agreement between the parties.
- Severability: If one provision of this Agreement is held invalid, that shall not affect any other provision of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed on the day and year first above written.

GRANTORS:

X Sharon Walker X____________________

Sharon Walker

X____________________ X____________________

X____________________ X____________________

GRANTEES:

X Operations Mgmt Partner X____________________

Jerel L. Wulf, Operations Management Partner

X Dennis Wulf FMP X____________________

Dennis Wulf, Financial Matters Partner

X____________________ X____________________

ACKNOWLEDGEMENTS

STATE OF South Dakota)
) ss. (Individual)
COUNTY OF Corson)

The foregoing instrument was acknowledged before me this 28 day of December, 2010
by Sharon Walker

Notary Public
My commission expires: 5-2-13

HOPE MAHER
NOTARY PUBLIC
STATE OF SOUTH DAKOTA

STATE OF Minnesota)
) ss. (Partnership)
COUNTY OF Stevens)

The foregoing instrument was acknowledged before me this 4 day of January, 2011
by Teral Wulf & Dennis Wulf, partner(s), on
behalf of Wulf Cattle Co. LLP, a partnership.

Notary Public
My commission expires: 1-31-2015

DENNIS L. SLEITER
NOTARY PUBLIC - MINNESOTA
My Comm. Exp. Jan. 31, 2015

STATE OF _____)
) ss. (Corporation)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, _____
by _____ as _____ of
_____, a _____
corporation, on behalf of the corporation.

Notary Public
My commission expires: _____

This instrument was drafted by:
AgCountry Farm Credit Services
102 S. Atlantic Ave
Morris, MN 56267

Section I: Sitemap Assessment and Land Treatment Information

Management Considerations For Nitrogen

Groundwater Concerns

The groundwater concern comes primarily from nitrogen. If not captured by plant roots, it can move down below the root zone and may enter the groundwater. The speed at which nitrate moves depends on the amount of precipitation and soil texture. Water moves through sandy soil much more rapidly than a clay soil.

Because nitrate moves through soil with water, it is extremely important that the rate applied, either as manure or fertilizer, does not exceed that which can be used by crops. Any nitrate remaining in the soil profile at the end of the season is subject to leaching.

Water Quality Risk Assessment Maps will be labeled with the symbol "L" on fields that are Vulnerable to N leaching.

If a field is determined highly vulnerable for nitrate leaching to an aquifer, all of the following management activities will be implemented.

1. Prior to the application of nitrogen above starter application rates, a nitrate nitrogen test **(zero to two foot and two to four foot sample)** will be taken and analyzed. **Or** An acceptable alterative to the zero to four feet sampling method would be to take a **zero to two foot sample every year within four weeks after crop harvest** prior to nitrogen applications above starter rates as recommended by SDSU.
2. Soil samples (zero to six inches) should also be included and analyzed for P and K. Soil samples will be taken as per land grant university recommendations found on the back of the SDSU Soil Testing Laboratory Soil Sample Information Sheet, or SDSU-FS935, "Recommended Soil Sampling Methods for South Dakota."

Nitrogen Best Management Practices

- Match manure nutrient applications to crop needs.
- Apply manure as close to the time of crop utilization as possible. Apply commercial fertilizer nitrogen in a sidedress or split application when fields are located over shallow aquifers or on soils that have a high leaching potential.
- Delay fall manure applications until soil temperatures drop below 50°F to minimize nitrate leaching and ammonia volatilization.
- Avoid applying manure on wet soils to minimize soil compaction, runoff, nitrate leaching and denitrification.
- Inject or incorporate the manure into the soil preferably within 24 hours for maximum nutrient-use efficiency and to reduce odor and runoff problems. Significant volatilization losses will occur when manure is left on the surface for several days.

Nitrogen Recommendations Using Manure

Crops can contain large amounts of nitrogen (Table 4-1). In most cases only the grain is removed and the straw is returned to the soil, supplying nitrogen through mineralization in subsequent years. Because of this and the other sources of N such as nitrate N already in soil, soil organic matter, precipitation and legumes, crop removal alone is not a good estimate of the amount of N to apply.

Table 4-1 Nitrogen Contained in Crops

Crop	Plant Part		
	Grain	Straw	Total
	----------pounds N----------		
Corn (bu)	0.9	0.5	1.4
Soybeans (bu)	3.7	0.8	4.5
Wheat (bu)	1.6	0.8	2.6
Oats (bu)	0.9	0.4	1.3
Barley (bu)	1.1	0.4	1.5
Sunflowers (cwt)	2.8	2.4	5.2
Alfalfa (ton)	----	----	55
Grass (ton)	----	----	30

Table 4-2 Nitrogen Requirements of Crops

Crop	Unit	Nitrogen Required[1/]
Wheat	bu	2.5 x yield[2/]
Oats	bu	1.3 x yield
Barley		
malting	bu	1.5 x yield
feed	bu	1.7 x yield
Rye	bu	2.5 x yield
Flax	bu	3.0 x yield
Corn (grain)	bu	1.2 x yield
Corn (silage)	ton	10.4 x yield
Sorghum (grain)	bu	1.1 x yield
Sorghum, sudan (hay)	ton	25 x yield
Grass hay	ton	25 x yield
Sunflowers	lb	0.05 x yield
Edible beans	lb	0.05 x yield
Millet	lb	0.035 x yield
Rape	cwt	6.5 x yield
Mustard	cwt	6.5 x yield
Safflower	lb	0.05 x yield
Buckwheat	bu	2.2 x yield
Potatoes	cwt	0.4 x yield

1/ Available manure nitrogen or fertilizer nitrogen to apply is equal to the nitrogen requirement minus soil NO_3 – N to a 2-ft depth minus any legume credits.
2/ Yield goal

Management Considerations For Phosphorus

Surface Water Concerns

Surface water concerns focus primarily on Phosphorus. Phosphorus acts very differently in soils than nitrogen. It attaches tightly to soils and does not generally move down through the soil profile. This lack of movement through soils results in accumulations of phosphorus in soil if phosphorus rates, either from manure or fertilizer, are greater than crop removal.

Increases in phosphorus concentrations in soil can result in more phosphorus moving off the field either attached to soil particles lost by erosion or dissolved in the runoff water. In some situations phosphorus could move into surface waters with manure itself if the manure is applied in such a manner that it moves directly into waterways.

Water Quality Risk Assessment Maps will be labeled with the symbol "R" on fields that are Vulnerable to Phosphorus runoff.

1. In no case shall manure or organic by product applications (broadcast or incorporated/injected) be made within 100 feet of a surface water or conveyance; 35 feet if a perennial grass filter strip is established and maintained.

2. A minimum of a 35-foot wide perennial grass filter strip is required in all cases on the edges of fields that border a lake, river, or intermittent/perennial stream.

3. In selected cases based on Table 1, depending on soil test phosphorus and estimated soil loss in a field, a perennial grass filter strip maybe required within 100 feet of a surface water or conveyance if manure is applied based on nitrogen needs of a crop and not crop removal of phosphorus (see Table 1).

Phosphorus Based Manure Application

If the manure application is required to be based on phosphorus crop removal, the application rate shall be based on phosphorus removed in the harvested portion of the crop.

Application can be based on multi-year phosphorus crop removal but cannot exceed the one year nitrogen crop need, and no manure may be applied to that field again until the applied phosphorus has been removed from the field via harvest and crop removal.

(See Table 1 for additional information)

Usually fields with High soil test P and/or high runoff potential.

Phosphorus Best Management Practices

- Establish and maintain grass filter strips at the point where water leaves the field to trap sediment and nutrients
- Control sheet and rill erosion by installing conservation practices including conservation tillage, contour farming, strip cropping, terraces and cover crops
- Control ephemeral erosion by installing grassed waterways, diversions and sediment retention structures.
- Incorporate or inject manure and commercial fertilizer where possible while maintaining sufficient crop residue levels for erosion control
- Grow high yielding, high phosphorus removing crops on fields with already high soil test phosphorus to reduce test levels

How Phosphorus affects Soils Tests

Phosphorus rate recommendations are based on the phosphorus soil test. This test is an index of availability of phosphorus to plants. It is not a measure of total available phosphorus or total phosphorus in soil. However, as total phosphorus levels increase in soils, the soil test index usually increases also.

These categories represent a decreasing probability of a yield response to broadcast fertilizer or manure. The probability of response is from about 80 percent at the very low soil test level to less than a 20 percent chance when soil tests are in the very high range.

Table 4-3 Soil Test Calibration Levels Used for Phosphorus and Potassium in SD

Nutrient	Name of Soil Test	Categories				
		Very Low	Low	Medium	High	Very High
		----------ppm extractable (0-6 inch sample)----------				
Phosphorus	Bray P-1	0 – 5	6 – 10	11 – 15	16 – 20	21+
Phosphorus	Olsen	0 – 3	4 – 7	8 – 11	12 – 15	16+
Potassium	NH_4Ac	0 – 40	41 - 80	81 - 120	121 - 160	161+

If phosphorus is applied at rates greater than crop removal (Table 4-4), phosphorus soil test levels will increase. As a very general rule of thumb, for **every 20 pounds of phosphorus (P_2O_5) applied and not removed by crops, the soil test index will increase by 1 part per million (ppm).**
Following a good nitrogen application plan with manure in South Dakota can often result in a one to three ppm increase per year in the phosphorus soil test.

Table 4-4 Phosphorus Content of the Harvested Portion of Crops

Crop	P_2O_5 (lbs)
Alfalfa (per ton)	12
Buckwheat (per bu)	0.53
Canola (per cwt)	1.5
Corn Grain (per bu)	0.35
Corn Silage (per ton)	4.3
Edible Beans (per cwt)	1.25
Feed Barley (per bu)	0.41
Flax (per bu)	0.7
Forage Sorghum (per ton)	5.8
Grass (per ton)	10
Malting Barley (per bu)	0.41
Millet (per cwt)	0.83
Mustard (per cwt)	1.5
Oats (per bu)	0.25
Potatoes (per cwt)	0.09
Rapeseed (per cwt)	1.5
Rye (per bu)	0.48
Safflower (per cwt)	1.14
Sorghum (per bu)	0.27
Soybean (per bu)	0.77
Sudan Grass (per ton)	5.8
Sunflowers (per cwt)	1.14
Wheat (per bu)	0.56

As the phosphorus soil test index increases, the possibility of moving significant amounts of phosphorus off the field to surface water usually increases. The movement is both phosphorus attached to soil particles lost with erosion and phosphorus dissolved in the runoff water.

From 60 to 80 percent of the phosphorus in most manure is available to plants within the first year of application. After several years of application, the amount of phosphorus available to plants from manure is equal to that applied with the manure each year.

1/ Source:

Jim Gerwing, Extension Soil Specialist
Ron Gelderman, Director, Soil Testing Lab
South Dakota State University

October 2007

Manure Application On Frozen Ground

Manure shall not be applied to frozen, snow covered, or saturated soil if the potential risk for runoff exists. In South Dakota (SD), this is interpreted to mean no manure application during periods when the soil surface is frozen (approximately November 15 to March 30). However, care and common sense must always be used to make sure manure applications and potential runoff will not cause environmental degradation to surface water regardless of what time of year it is.

Liquid manure applications to frozen or snow-covered (winter) soil will not be allowed. In situations where a catastrophic system failure is imminent; manure may be applied to soils with slopes less than 4 percent provided that a 1,000-foot setback is maintained to a lakes, rivers, streams and a 300-foot setback to non-cropped wetland or conveyances to lakes, rivers, or streams.

Incidental winter application of solid manure, waste feed materials, snow, and ice will be allowed to facilitate the proper operation of open feedlots by allowing producers to clean along feed bunks, watering areas, and allow removal of snow and ice from open lots.

1. **Frozen ground manure applications will not exceed the rate calculated in the nutrient budget for the application field based on the current fall soil test results and applications will be no more than 10 percent of the annual manure production.**

2. **Frozen ground applications will only be allowed on slopes that are four percent or less and will be prioritized using current soil loss calculations based on the water erosion prediction technology as listed in the SD Technical Guide. Fields with the lowest predicted soil loss will have the highest priority for winter applications.**

3. **No manure application on floodplains (as defined by the Natural Resources Conservation Service (NRCS) in the soil survey as frequently or occasionally flooded).**

4. **No manure application within a 300-foot setback from conveyances or non-cropped wetlands.**

5. **No manure application within 1,000 feet of lakes, rivers, and named perennial streams.**

Review and comply with other specific winter application requirements in the current SD General Livestock Permit regulations or your local county zoning ordinance when dealing with state and locally permitted facilities.

Failure to follow this guidelines could lead to United States Department of Agriculture contract violations and may result in monetary penalties due to breach of contract (see your contract appendix or contact your local NRCS office for further clarification).

USDA NRCS

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RUSLE2 Profile Erosion Calculation Record

Field 1

Info: T1631, F1, NW1/4 3-21-26; C S-WW-O-C-O; DaA Soil; No-Till

Inputs: Rotation: Corn (Silage) – Winter Wheat – Oats – Corn (Grain) - Oats
File: profiles\Corson County
Location: South Dakota\Corson County
Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%
T value: 2.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 3.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	58.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:
Soil loss for cons. plan: 0.59 t/ac/yr Sediment delivery: 0.59 t/ac/yr
Net C factor: 0.13
Net K factor: 0.22
Net LS factor: 0.39

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/10/0	Planter, double disk opnr w/fluted coulter	Corn, silage	61
9/1/0	Harvest, residue, forage chopper, complete		8.7
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	15
7/20/1	Harvest, killing crop 50pct standing stubble		75
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	77

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RUSLE2 Profile Erosion Calculation Record

Field 2

Info: T1631, F2, NW1/4 3-21-26; CS-WW-O-C-O; RnB Soil; No-Till

Inputs: Rotation: Corn(silage) – Winter Wheat – Oats – Corn(grain) - Oats

Location: South Dakota\Corson County **File:** profiles\Corson County

Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%

T value: 3.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 5.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	58.000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 1.1 t/ac/yr Sediment delivery: 1.1 t/ac/yr

Net C factor: 0.13

Net K factor: 0.26

Net LS factor: 0.64

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/10/0	Planter, double disk opnr w/fluted coulter	Corn, silage	61
9/1/0	Harvest, residue, forage chopper, complete		8.7
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	15
7/20/1	Harvest, killing crop 50pct standing stubble		75
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	77

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RUSLE2 Profile Erosion Calculation Record

Field 3

Info: T11198, F8, SW1/4 of 4-21-27; ShB Soil; C-C-WW-C-O Rotation; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 50 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.081 t/ac/yr Sediment delivery: 0.081 t/ac/yr
Net C factor: 0.033
Net K factor: 0.20
Net LS factor: 0.24

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, grain	86
10/15/0	Harvest, killing crop 50pct standing stubble		88
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/1	Harvest, silage		75
9/15/1	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/2	Harvest, killing crop 50pct standing stubble		85
5/15/3	Planter, double disk opnr w/fluted coulter	Corn, grain	82

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RUSLE2 Profile Erosion Calculation Record

Field 4

Info: T1637, F2, E1/2 of 5-21-26; Soil RcC; O-C-WW-C-O; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\Corson County
Soil: Corson, SD soils\RcC REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES\REEDER loam 60%
T value: 3.0 t/ac/yr
Slope length (horiz): 200 ft
Avg. slope steepness: 8.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.13 t/ac/yr Sediment delivery: 0.13 t/ac/yr
Net C factor: 0.015
Net K factor: 0.17
Net LS factor: 0.96

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	87
7/15/0	Harvest, killing crop 50pct standing stubble		96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, silage	94
9/1/1	Harvest, killing crop 50pct standing stubble		97
9/15/1	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	98

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RUSLE2 Profile Erosion Calculation Record

Field 5

Info: T11199, F3, SW1/4 of 5-21-27; Soil An; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County
File: profiles\default
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 200 ft
Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.045 t/ac/yr Sediment delivery: 0.045 t/ac/yr
Net C factor: 0.036
Net K factor: 0.17
Net LS factor: 0.14

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/0	Harvest, silage		74
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/1	Harvest, killing crop 50pct standing stubble		85
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/15/2	Harvest, killing crop 50pct standing stubble		87
4/15/3	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	85

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RUSLE2 Profile Erosion Calculation Record

Field 6 1/4

Info: T11199, F6, SE1/2 of 5-21-27; Soil RaB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%
T value: 3.0 t/ac/yr
Slope length (horiz): 100 ft
Avg. slope steepness: 4.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.12 t/ac/yr Sediment delivery: 0.12 t/ac/yr
Net C factor: 0.030
Net K factor: 0.17
Net LS factor: 0.47

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/0	Harvest, silage		74
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/1	Harvest, killing crop 50pct standing stubble		85
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/15/2	Harvest, killing crop 50pct standing stubble		87
4/15/3	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	85

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RUSLE2 Profile Erosion Calculation Record

Field 7

Info: T1764, F1, NW1/4 of 6-21-27; Soil ShB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 50 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.082 t/ac/yr Sediment delivery: 0.082 t/ac/yr
Net C factor: 0.033
Net K factor: 0.20
Net LS factor: 0.24

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/0	Harvest, silage		74
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/1	Harvest, killing crop 50pct standing stubble		85
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/15/2	Harvest, killing crop 50pct standing stubble		87
4/15/3	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	85

USDA NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 8

Info: T11329, F1, SE1/4 of 6-21-27; Soil ShB; Rotation CS-WW-C-O-C; No-Till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 50 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.082 t/ac/yr Sediment delivery: 0.082 t/ac/yr
Net C factor: 0.033
Net K factor: 0.20
Net LS factor: 0.24

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/0	Harvest, silage		74
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/1	Harvest, killing crop 50pct standing stubble		85
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/15/2	Harvest, killing crop 50pct standing stubble		87
4/15/3	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	85

USDA NRCS Natural Resources Conservation Service

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RUSLE2 Profile Erosion Calculation Record

Field 9

Info: **T11329, F2, W1/2 of 7-21-27; Soil ShB; Rotation C-C-WW-C-O; No-till**

Inputs:

File: profiles\default

Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 50 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Oats, spring	bu	58.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.081 t/ac/yr Sediment delivery: 0.081 t/ac/yr
Net C factor: 0.033
Net K factor: 0.20
Net LS factor: 0.24

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, grain	86
10/15/0	Harvest, killing crop 50pct standing stubble		88
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, silage	84
9/1/1	Harvest, silage		75
9/15/1	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	70
7/20/2	Harvest, killing crop 50pct standing stubble		85
5/15/3	Planter, double disk opnr w/fluted coulter	Corn, grain	82

USDA NRCS Natural Resources Conservation Service

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RUSLE2 Profile Erosion Calculation Record

Field 10

Info: T1898, F1, NW1/4 8-21-27; CS-WW-C-B-C; ShB Soil; No-Till

Inputs:

Location: South Dakota\Corson County **File:** profiles\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 170 ft
Avg. slope steepness: 5.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Barley, spring	Bushels	39.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.51 t/ac/yr Sediment delivery: 0.51 t/ac/yr
Net C factor: 0.073
Net K factor: 0.20
Net LS factor: 0.65

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/10/0	Planter, double disk opnr w/fluted coulter	Corn, silage	62
9/1/0	Harvest, residue, forage chopper, complete		14
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	21
7/20/1	Harvest, killing crop 50pct standing stubble		77
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	77
10/20/2	Harvest, residue, forage chopper, complete		13
4/30/3	Drill or airseeder, double disk, w/ fluted coulters	Barley, spring	15

USDA NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 11

Info: T1426, F1, NE1/4 of 8-21-27; Soil An; Rotation CS-WW-C-B-C; No-Till

Inputs:

File: profiles\default

Location: South Dakota\Corson County
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 200 ft
Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Barley, spring	Bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn; Wheat; Oats; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.048 t/ac/yr Sediment delivery: 0.048 t/ac/yr
Net C factor: 0.038
Net K factor: 0.17
Net LS factor: 0.14

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	82
9/1/0	Harvest, silage		72
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	68
7/20/1	Harvest, killing crop 50pct standing stubble		84
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/15/2	Harvest, killing crop 50pct standing stubble		86
4/30/3	Drill or airseeder, double disk, w/ fluted coulters	Barley, spring	84

USDA NRCS

South Dakota

RUSLE2 CSP Record

Info:
Date: June 11, 2013

Name: Wulf Cattle Company

Tract and Field #'s: Field #12A

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 200 ft
Avg. slope steepness: 2.0 %

Man.	*Management*
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	*Yield units*	*Yield (# of units)*
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial
General yield level: Set by user

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 1.5 t/ac/yr

Soil conditioning index (SCI): 0.08
Avg. annual slope STIR: 10.0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- A positive SCI meets the soil criteria for the Conservation Security Program.

The STIR value is the Soil Tillage Intensity Rating.

- It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.
- STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS

South Dakota

RUSLE2 CSP Record

Info:
Date: **June 11, 2013**

Name: Wulf Cattle Company

Tract and Field #'s: Field #12B

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 600 ft
Avg. slope steepness: 2.0 %

Man.	*Management*
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	*Yield units*	*Yield (# of units)*
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial
General yield level: Set by user

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 1.9 t/ac/yr

Soil conditioning index (SCI): 0.05
Avg. annual slope STIR: 10.0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- A positive SCI meets the soil criteria for the Conservation Security Program.

The STIR value is the Soil Tillage Intensity Rating.

- It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.
- STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 13

Info: T1929, F1 SW1/4 of 9-21-27; Soil ShB; CS-WW-CS-WW-C; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 50 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.076 t/ac/yr Sediment delivery: 0.076 t/ac/yr
Net C factor: 0.031
Net K factor: 0.20
Net LS factor: 0.24

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	86
9/1/0	Harvest, silage		76
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	72
7/20/1	Harvest, killing crop 50pct standing stubble		86
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	83
9/1/2	Harvest, silage		78
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	75

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SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 14

Info: T11460, F1, NE1/4 of 9-22-27; Soil RsB; CS-WW-CS-WW-C; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%
T value: 2.0 t/ac/yr
Slope length (horiz): 200 ft
Avg. slope steepness: 6.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.24 t/ac/yr Sediment delivery: 0.24 t/ac/yr
Net C factor: 0.027
Net K factor: 0.22
Net LS factor: 0.74

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	86
9/1/0	Harvest, silage		76
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	72
7/20/1	Harvest, killing crop 50pct standing stubble		86
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	83
9/1/2	Harvest, silage		78
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	75

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SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 15

Info: T1894, F3, SE1/4 of 9-22-27; Soil RaA; CS-WW-CS-WW-C; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\RaA REEDER LOAM, 0 TO 2 PERCENT SLOPES\REEDER loam 90%
T value: 3.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.042 t/ac/yr Sediment delivery: 0.042 t/ac/yr
Net C factor: 0.034
Net K factor: 0.17
Net LS factor: 0.14

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	86
9/1/0	Harvest, silage		76
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	72
7/20/1	Harvest, killing crop 50pct standing stubble		86
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	83
9/1/2	Harvest, silage		78
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	75

RUSLE2 Profile Erosion Calculation Record

Field 16

Info: T1900, F1, E1/2 of 10-22-27; Soil RsB; CS-WW-CS-WW-C; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%
T value: 2.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 6.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.22 t/ac/yr Sediment delivery: 0.22 t/ac/yr
Net C factor: 0.026
Net K factor: 0.22
Net LS factor: 0.72

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	86
9/1/0	Harvest, silage		76
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	72
7/20/1	Harvest, killing crop 50pct standing stubble		86
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	83
9/1/2	Harvest, silage		78
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	75

USDA NRCS

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 17

Info: T1763, F1, SE1/4 of 13-21-26; Soil RaB; CS-WW-C-SF-SW; No-till

Inputs:

Location: South Dakota\Corson County

File: profiles\default

Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%

T value: 3.0 t/ac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 4.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Sunflower	lbs	800.00
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, spring 7in rows	bushels	26.000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.18 t/ac/yr Sediment delivery: 0.18 t/ac/yr

Net C factor: 0.042

Net K factor: 0.17

Net LS factor: 0.50

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/15/0	Planter, double disk opnr w/fluted coulter	Corn, silage	58
9/1/0	Harvest, silage		55
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	54
7/20/1	Harvest, killing crop 50pct standing stubble		83
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, grain	81
10/15/2	Harvest, killing crop 50pct standing stubble		87
5/25/3	Planter, double disk opnr w/fluted coulter	Sunflower	83

US NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 18

Info: T1892, F2, N 1/2 of 15-22-27; Soil DaA; WW-CS-WW-CS-SF; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\default
Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%
T value: 2.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 3.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Sunflower	lbs	800.00

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.090 t/ac/yr Sediment delivery: 0.090 t/ac/yr
Net C factor: 0.021
Net K factor: 0.22
Net LS factor: 0.36

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	53
7/20/1	Harvest, killing crop 50pct standing stubble		80
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	79
9/1/2	Harvest, killing crop 50pct standing stubble		91
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	92
7/20/3	Harvest, killing crop 50pct standing stubble		94
5/25/4	Planter, double disk opnr w/fluted coulter	Corn, grain	88

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SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 14

Info: T1892, F3, N 1/2 of 15-22-27; Soil SgA; WW-CS-WW-CS-SF; No-till

Inputs:

Location: South Dakota\Corson County

File: profiles\default

Soil: Corson, SD soils\SgA SAVAGE SILT LOAM, 0 TO 3 PERCENT SLOPES\SAVAGE silt loam 85%

T value: 5.0 t/ac/yr

Slope length (horiz): 100 ft

Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, silage	tons	6.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Wheat, winter 7in rows	bushels	42.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Corn, grain	bushels	56.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3	Sunflower	lbs	800.00

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.090 t/ac/yr Sediment delivery: 0.090 t/ac/yr

Net C factor: 0.021

Net K factor: 0.22

Net LS factor: 0.36

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	53
7/20/1	Harvest, killing crop 50pct standing stubble		80
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	79
9/1/2	Harvest, killing crop 50pct standing stubble		91
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	92
7/20/3	Harvest, killing crop 50pct standing stubble		94
5/25/4	Planter, double disk opnr w/fluted coulter	Corn, grain	88

USDA NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 20

Info: T1901, F1, E1/2 of 16-22-27; Soil RsB; CS-WW-CS-WW-CS; No-till

Inputs:

Location: South Dakota\Corson County

File: profiles\Corson County

Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

T value: 2.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 7.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.47 t/ac/yr Sediment delivery: 0.47 t/ac/yr

Net C factor: 0.045

Net K factor: 0.22

Net LS factor: 0.87

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/10/0	Planter, double disk opnr w/fluted coulter	Corn, silage	79
9/1/0	Harvest, residue, forage chopper, complete		22
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	28
7/20/1	Harvest, killing crop 50pct standing stubble		78
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	77
9/1/2	Harvest, residue, forage chopper, complete		15
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	22

US NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 21

Info: T10091, F4, N1/2 of 19-22-27; Soil StA; CS-WW-CS-WW-CS; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\Corson County
Soil: Corson, SD soils\StA STADY LOAM, 0 TO 2 PERCENT SLOPES\STADY loam 85%
T value: 4.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Wheat, winter 7in rows	bushels	43.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, silage	tons	9.0000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.13 t/ac/yr Sediment delivery: 0.13 t/ac/yr
Net C factor: 0.050
Net K factor: 0.20
Net LS factor: 0.26

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
5/10/0	Planter, double disk opnr w/fluted coulter	Corn, silage	79
9/1/0	Harvest, residue, forage chopper, complete		22
9/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	28
7/20/1	Harvest, killing crop 50pct standing stubble		78
5/15/2	Planter, double disk opnr w/fluted coulter	Corn, silage	77
9/1/2	Harvest, residue, forage chopper, complete		15
9/15/2	Drill or airseeder, double disk, w/ fluted coulters	Wheat, winter 7in rows	22

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SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 22

Info: T1767, F2, E1/2 of 30-22-27; Soil StA; O-C-O-C-O; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\Corson County
Soil: Corson, SD soils\StA STADY LOAM, 0 TO 2 PERCENT SLOPES\STADY loam 85%
T value: 4.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.040 t/ac/yr Sediment delivery: 0.040 t/ac/yr
Net C factor: 0.027
Net K factor: 0.20
Net LS factor: 0.14

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	87
7/15/0	Harvest, killing crop 50pct standing stubble		96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, grain	94
10/20/1	Harvest, killing crop 50pct standing stubble		94
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	92
7/20/2	Harvest, killing crop 50pct standing stubble		95
5/10/3	Planter, double disk opnr w/fluted coulter	Corn, grain	91

US NRCS Natural Resources Conservation Service

SD-CPA-29

RUSLE2 Profile Erosion Calculation Record

Field 23

Info: T1767, F5, N1/2 of 31-22-27; Soil Gr; O-C-O-C-O; No-till

Inputs:

Location: South Dakota\Corson County

File: profiles\Corson County

Soil: Corson, SD soils\Gr GRAIL SILTY CLAY LOAM\GRAIL silty clay loam 90%

T value: 5.0 t/ac/yr

Slope length (horiz): 200 ft

Avg. slope steepness: 1.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.054 t/ac/yr Sediment delivery: 0.054 t/ac/yr

Net C factor: 0.027

Net K factor: 0.26

Net LS factor: 0.14

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	87
7/15/0	Harvest, killing crop 50pct standing stubble		96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, grain	94
10/20/1	Harvest, killing crop 50pct standing stubble		94
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	92
7/20/2	Harvest, killing crop 50pct standing stubble		95
5/10/3	Planter, double disk opnr w/fluted coulter	Corn, grain	91

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RUSLE2 Profile Erosion Calculation Record

Field 24

Info: T1767, F6, SE1/4 of 31-22-27; Soil ShA; O-C-O-C-O; No-till

Inputs:

Location: South Dakota\Corson County **File:** profiles\Corson County
Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 100 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\Corn Silage; WW; Corn Silage; WW; Corn; NT, Z3#2	Oats, spring	bu	65.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.065 t/ac/yr Sediment delivery: 0.065 t/ac/yr
Net C factor: 0.024
Net K factor: 0.20
Net LS factor: 0.25

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	87
7/15/0	Harvest, killing crop 50pct standing stubble		96
5/10/1	Planter, double disk opnr w/fluted coulter	Corn, grain	94
10/20/1	Harvest, killing crop 50pct standing stubble		94
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	92
7/20/2	Harvest, killing crop 50pct standing stubble		95
5/10/3	Planter, double disk opnr w/fluted coulter	Corn, grain	91

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RUSLE2 Profile Erosion Calculation Record

Field 25

Info: T1638, F1A, S1/2 of 34-22-26; W-C-O-C-B, RsB Soil; No-Till

Inputs:

Location: South Dakota\Corson County

File: profiles\Corson County

Soil: Corson, SD soils\RsB RHOADES-DAGLUM LOAMS, 0 TO 9 PERCENT SLOPES\RHOADES loam 50%

T value: 2.0 t/ac/yr

Slope length (horiz): 150 ft

Avg. slope steepness: 7.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Barley, spring	Bushels	39.000

Contouring: a. rows up-and-down hill

Strips/barriers: (none)

Diversion/terrace, sediment basin: (none)

Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.30 t/ac/yr Sediment delivery: 0.30 t/ac/yr

Net C factor: 0.028

Net K factor: 0.22

Net LS factor: 0.85

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, spring 7in rows	89
7/20/0	Harvest, killing crop 50pct standing stubble		89
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/20/1	Harvest, killing crop 60pct standing stubble		83
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	83

RUSLE2 Profile Erosion Calculation Record

Field 26

Info: T1638, F1B, S1/2 of 34-22-26; W-C-O-C-B, DaA Soil; No-Till

Inputs:

File: profiles\Corson County

Location: South Dakota\Corson County
Soil: Corson, SD soils\DaA DAGLUM LOAM, 0 TO 3 PERCENT SLOPES\DAGLUM loam 85%
T value: 2.0 t/ac/yr
Slope length (horiz): 200 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Oats, spring	bu	65.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Barley, spring	Bushels	39.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.11 t/ac/yr Sediment delivery: 0.11 t/ac/yr
Net C factor: 0.034
Net K factor: 0.22
Net LS factor: 0.26

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, spring 7in rows	89
7/20/0	Harvest, killing crop 50pct standing stubble		89
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	82
10/20/1	Harvest, killing crop 60pct standing stubble		83
4/15/2	Drill or airseeder, double disk, w/ fluted coulters	Oats, spring	83

RUSLE2 Profile Erosion Calculation Record

Field 27

Info: T1770, F1, NW1/4 of 34-22-27; W-C-W-C-W, ShA Soil; No-Till

Inputs:

File: profiles\Corson County

Location: South Dakota\Corson County
Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 150 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.13 t/ac/yr Sediment delivery: 0.13 t/ac/yr
Net C factor: 0.046
Net K factor: 0.20
Net LS factor: 0.26

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, spring 7in rows	77
7/20/0	Harvest, killing crop 50pct standing stubble		81
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	74
10/20/1	Harvest, killing crop 60pct standing stubble		79

RUSLE2 Profile Erosion Calculation Record

Field 28

Info: T1766, F1, NE1/4 of 34-22-27; W-C-WC-W, An Soil; No-Till

Inputs:

File: profiles\Corson County

Location: South Dakota\Corson County
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%
T value: 5.0 t/ac/yr
Slope length (horiz): 100 ft
Avg. slope steepness: 2.0 %

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Corn, grain	bushels	63.000
CMZ 04\c.Other Local Mgt Records\SW-C-SW-C-SF-Notill	Wheat, spring 7in rows	bushels	28.000

Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)
Adjust res. burial level: Normal res. burial

Outputs:

Soil loss for cons. plan: 0.11 t/ac/yr Sediment delivery: 0.11 t/ac/yr
Net C factor: 0.046
Net K factor: 0.17
Net LS factor: 0.25

Date	*Operation*	*Vegetation*	*Surf. res. cov. after op, %*
4/15/0	Drill or airseeder, double disk, w/ fluted coulters	Wheat, spring 7in rows	77
7/20/0	Harvest, killing crop 50pct standing stubble		81
5/15/1	Planter, double disk opnr w/fluted coulter	Corn, grain	74
10/20/1	Harvest, killing crop 60pct standing stubble		79

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 29, N ½, Section 4, T 20 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\SgB SAVAGE SILT LOAM, 3 TO 6 PERCENT SLOPES\SAVAGE silt loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.32 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 30, NW ¼, Section 4, T 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RaC REEDER LOAM, 6 TO 9 PERCENT SLOPES\REEDER loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 7.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.080 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 31, N ½, S 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.047 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 32, NE ¼, S 4, T 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RpC REGENT-WAYDEN SILTY CLAY LOAMS, 6 TO 15 PERCENT SLOPES\REGENT silty clay loam 50%
Slope length (horiz): 150 ft
Avg. slope steepness: 10 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.39 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 33, N ½, S 7, T 21, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.11 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 34, NE ¼, Section 7, T 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RcB REEDER-CABBA LOAMS, 3 TO 6 PERCENT SLOPES\REEDER loam 60%
Slope length (horiz): 150 ft
Avg. slope steepness: 5.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.21 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 35, W ½, S 10, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.31 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 36, SE ¼, Section 10, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\VeB VEBAR FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES\VEBAR fine sandy loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.22 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 37, S ½, Section 11, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\Gr GRAIL SILTY CLAY LOAM\GRAIL silty clay loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 1.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.070 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 38, W ½, Section 12, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.093 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 39, E ½, Section 14, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RnB REGENT SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES\REGENT silty clay loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.095 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 40, NE ¼, Section 23, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\SgB SAVAGE SILT LOAM, 3 TO 6 PERCENT SLOPES\SAVAGE silt loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.079 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 41, SE ¼, Section 24, T 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\An ARNEGARD LOAM\ARNEGARD loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 1.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Wheat, winter; Corn, grain; Sunflowers; NT, Z3

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.011 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 42, SE ¼, Section 24, T 21 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: a.Single Year/Single Crop Templates\Corn, grain\Corn, grain; NT, Z3

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 0.069 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 43, W ½, Section 26, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.15 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 44, S ½, Section 32, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\VeB VEBAR FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES\VEBAR fine sandy loam 85%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.16 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 45, NE ¼, Section 32, T 22 N, R 26 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RcC REEDER-CABBA LOAMS, 6 TO 9 PERCENT SLOPES\REEDER loam 60%
Slope length (horiz): 150 ft
Avg. slope steepness: 7.5 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\ Forage Rotations\Alfalfa, 1X; 2 additional years, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.48 t/ac/yr

USDA NRCS Natural Resources Conservation Service

RUSLE2 Erosion Calculation Record

Info: Field 46, W ½, Section 35, T 21 N, R 25 E

profiles\Corson Default

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\RaB REEDER LOAM, 2 TO 6 PERCENT SLOPES\REEDER loam 90%
Slope length (horiz): 150 ft
Avg. slope steepness: 4.0 %
Contouring: a. rows up-and-down hill
Strips/barriers: (none)
Diversion/terrace, sediment basin: (none)

Base management: b.Mullti-year Rotation Templates\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Outputs:
T value: 3.0 t/ac/yr
Soil loss for cons. plan: 0.17 t/ac/yr

USDA NRCS Natural Resources Conservation Service

South Dakota

RUSLE2 CSP Record

Info:
Date: **June 11, 2013**

Name: Wulf Cattle Company

Tract and Field #'s: Field #47A

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\ShB SHAMBO LOAM, 2 TO 6 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 350 ft
Avg. slope steepness: 2.2 %

Man.	*Management*
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	*Yield units*	*Yield (# of units)*
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial
General yield level: Set by user

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 1.9 t/ac/yr

Soil conditioning index (SCI): 0.05
Avg. annual slope STIR: 10.0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- A positive SCI meets the soil criteria for the Conservation Security Program.

The STIR value is the Soil Tillage Intensity Rating.

- It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.
- STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS Natural Resources Conservation Service

South Dakota

RUSLE2 CSP Record

Info:
Date: **June 11, 2013**

Name: Wulf Cattle Company

Tract and Field #'s: Field #47B

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\ShA SHAMBO LOAM, 0 TO 2 PERCENT SLOPES\SHAMBO loam 90%
Slope length (horiz): 400 ft
Avg. slope steepness: 1.5 %

Man.	*Management*
1	b.Mullti-year Rotation Templates\Continuous crop dryland rotations\Wheat, spring; Corn, silage; Sunflowers; NT, Z3

Vegetation	*Yield units*	*Yield (# of units)*
Wheat, spring 7in rows	bushels	29.000
Corn, silage	tons	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial
General yield level: Set by user

Outputs:
T value: 5.0 t/ac/yr
Soil loss for cons. plan: 1.3 t/ac/yr

Soil conditioning index (SCI): 0.10
Avg. annual slope STIR: 10.0
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- A positive SCI meets the soil criteria for the Conservation Security Program.

The STIR value is the Soil Tillage Intensity Rating.

- It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.
- STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

USDA NRCS Natural Resources Conservation Service

South Dakota

RUSLE2 CSP Record

Info:
Date: **August 5, 2013**

Name: Wulf Cattle Company

Tract and Field #'s: Field #48

Inputs:
Location: South Dakota\Corson County
Soil: Corson, SD soils\VhB VEBAR-COHAGEN FINE SANDY LOAMS, 2 TO 9 PERCENT SLOPES\COHAGEN fine sandy loam 30%
Slope length (horiz): 800 ft
Avg. slope steepness: 2.1 %

Man.	*Management*
1	a.Single Year/Single Crop Templates\Wheat, spring\Wheat, spring; NT, Z3
2	a.Single Year/Single Crop Templates\Oats\Oats; NT, Z3
3	a.Single Year/Single Crop Templates\Corn, grain\Corn, grain; NT, Z3
4	a.Single Year/Single Crop Templates\Sunflowers\Sunflowers; NT, Z3

Vegetation	*Yield units*	*Yield (# of units)*
Wheat, spring 7in rows	bushels	29.000
Oats, spring	bu	61.000
Corn, grain	bushels	75.000
Sunflower	lbs	1822.0

Adjust res. burial level: Normal res. burial
General yield level: Set by user

Outputs:
T value: 2.0 t/ac/yr
Soil loss for cons. plan: 0.35 t/ac/yr

Soil conditioning index (SCI): 0.5
Avg. annual slope STIR: 7.47
Wind & irrigation-induced erosion for SCI: 0 t/ac/yr

The SCI is the Soil Conditioning Index rating.

- If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system.
- If the index is a positive value, soil organic matter levels are predicted to increase under that system.
- A positive SCI meets the soil criteria for the Conservation Security Program.

The STIR value is the Soil Tillage Intensity Rating.

- It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation.

- STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

Section J: Soil Test Reports

AGVISE LABORATORIES

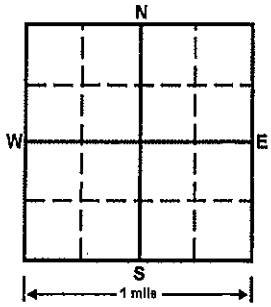
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8163509 LAB# 55758 BOX# 3925

FIELD 142
SAMPLE 1
CNTY CARSON
TWP 21-26
SEC 3 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

WULF CATTLE CO.

MCLAUGHLIN, SD

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/19/2011	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION VLow	Low	Med	High
0-6"	34 lb/ac				
6-24"	33 lb/ac				
0-24" Nitrate	67 lb/ac	******	******	*	
Olsen Phosphorus	26 ppm	******	******	******	******
Potassium	492 ppm	******	******	******	******
0-24" Chloride	28 lb/ac	******	*****		
0-6"	24 lb/ac	******	******	****	
6-24" Sulfur	360 +lb/ac	******	******	******	******
Boron					
Zinc					
Iron					
Manganese					
Copper	0.71 ppm	******	******	****	
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6"	0.29 mmho/cm	******	*		
6-24" Sol. Salts	1.4 mmho/cm	******	******	******	***

1st CROP CHOICE		
Oats		
Yield Goal		
100 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	33	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	12	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime		

2nd CROP CHOICE		
Corn-Grain		
Yield Goal		
100 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	53	
P_2O_5	40	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime		

3rd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	33	
P_2O_5	18	Band *
K_2O	0	
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range) % Ca	% Mg	% K	% Na	% H
5.9							

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

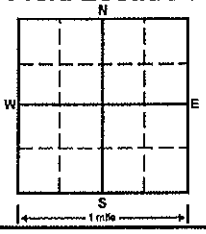
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 3 SAMPLE 14
CNTY CORSON
TWP 21-27 SECTION 4
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162654
LAB# 2276
BOX# 686

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6"	11 lb/ac				
6-24"	27 lb/ac				
0-24"	38 lb/ac	****	*		
Nitrate					
Olsen Phosphorus	10 ppm	****	****	***	
Potassium	318 ppm	****	****	****	****
0-24"	8 lb/ac	***			
Chloride					
0-6"	6 lb/ac	****			
6-24"	18 lb/ac	****			
Sulfur					
Boron					
Zinc					
Iron					
Manganese					
Copper	0.83 ppm	****	****	****	****
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
0-6"	0.13 mmho/cm	***			
6-24"	0.25 mmho/cm	****			
Sol. Salts					

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	70	
P_2O_5	20	Band *
K_2O	10	Band(Starter)*
Cl	32	Broadcast
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	82	
P_2O_5	30	Band *
K_2O	10	Band (2x2) *
Cl	**	
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	62	
P_2O_5	20	Band *
K_2O	0	
Cl	**	
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.1							

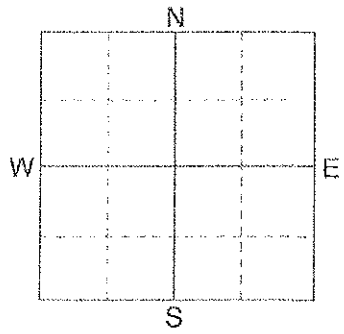
Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 70 lbs of 0-0-60 = 32 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 4
SAMPLE ID **2A 2B**
COUNTY **CORSON**
TWP **21N-26E**
SECTION **5** QTR ACRES **222**
PREV. CROP **Corn-Grain**



SUBMITTED FOR:
WULF CATTLE COMPANY

SUBMITTED BY: **MZ1154**
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57647

REF # **11234894** BOX # **0**
LAB # **NW3078**

Date Sampled **01/19/2012** Date Received **01/23/2012** Date Reported **1/24/2012**

Nutrient In The Soil		Interpretations
Nitrate 0-6"	16 lb/ac	
Nitrate 6-24"	9 lb/ac	
Nitrate 0-24"	25 lb/ac	
Phosphorus Olsen	9 ppm	
Potassium	288 ppm	
Chloride 0-24"	8 lb/ac	
Sulfur 0-6"	12 lb/ac	
Sulfur 6-24"	360 +lb/ac	
Boron		
Zinc		
Iron		
Manganese		
Copper	0.65 ppm	
Magnesium		
Calcium		
Sodium		
Org.Matter		
Carbonate(CCE)		
Sol. Salts 0-6"	0.28 mmho/cm	
Sol. Salts 6-24"	0.87 mmho/cm	

1st Crop Choice		
Oats		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	75	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	32	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd Crop Choice		
Barley-Malting		
YIELD GOAL		
50	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	53	
P_2O_5	24	Band *
K_2O	10	Band (Starter)*
Cl	32	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

3rd Crop Choice		
Sunflower		
YIELD GOAL		
2000	LBS	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	75	
P_2O_5	21	Band *
K_2O	0	
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.3							

Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 24 K2O = 25 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

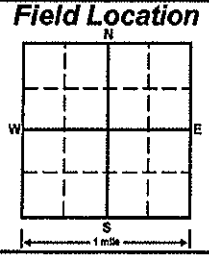
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 546 TEASPOONS SAMPLE 10
CNTY CORSON
TWP 21-27 SECTION 5
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162650
LAB# 2272
BOX# 620

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" / 6-24" / 0-24" Nitrate	11 lb/ac / 18 lb/ac / 29 lb/ac	***			
Olsen Phosphorus	9 ppm	****	****	**	
Potassium	348 ppm	****	****	****	****
0-24" Chloride	16 lb/ac	****	*		
0-6" / 6-24" Sulfur	10 lb/ac / 24 lb/ac	**** / ****	** / **		
Boron					
Zinc					
Iron					
Manganese					
Copper	0.65 ppm	****	****	****	**
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
0-6" / 6-24" Sol. Salts	0.15 mmho/cm / 0.19 mmho/cm	*** / ***			

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	79	
P_2O_5	22	Band *
K_2O	10	Band(Starter)*
Cl	24	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	91	
P_2O_5	32	Band *
K_2O	10	Band (2x2) *
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	71	
P_2O_5	20	Band *
K_2O	0	
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.0							

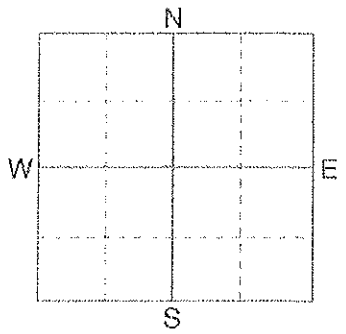
Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 52 lbs of 0-0-60 = 24 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID NW1/4 : 7
SAMPLE ID **BEAR SOLDI**
COUNTY **CORSON**
TWP T 21 R 27
SECTION 6 QTR ACRES **0**
PREV. CROP **Corn-Grain**



SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: **MZ1154**
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57647

REF # **11234889** BOX # **0**
LAB # **NW2572**

Date Sampled **01/12/2012** Date Received **01/17/2012** Date Reported **1/24/2012**

Nutrient In The Soil		Interpretation
Nitrate 0-6"	8 lb/ac	Very Low / Low / Medium
Nitrate 6-24"	9 lb/ac	***
Nitrate 0-24"	17 lb/ac	
Phosphorus Olsen	14 ppm	**********
Potassium	350 ppm	**********
Chloride		
Sulfur 0-6"	10 lb/ac	********
Sulfur 6-24"	24 lb/ac	**********
Boron		
Zinc	0.67 ppm	**********
Iron		
Manganese		
Copper		
Magnesium		
Calcium		
Sodium		
Org.Matter	3.1 %	**********
Carbonate(CCE)		
Sol. Salts 0-6"	0.17 mmho/cm	****
Sol. Salts 6-24"	0.29 mmho/cm	*******

1st Crop Choice			2nd Crop Choice			3rd Crop Choice		
Sunflower			Sunflower			Wheat-Spring		
YIELD GOAL			YIELD GOAL			YIELD GOAL		
1800	LBS		2000	LBS		40	BU	
SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES		
Band			Band			Band		
LB/ACRE		APPLICATION	LB/ACRE		APPLICATION	LB/ACRE		APPLICATION
N	73		N	83		N	91	
P_2O_5	15	Band *	P_2O_5	17	Band *	P_2O_5	16	Band *
K_2O	0		K_2O	0		K_2O	10	Band (Starter)*
Cl			Cl			Cl		
S	7	Band (Trial)	S	7	Band (Trial)	S	7	Band (Trial)
B			B			B		
Zn	2	Band (Trial)	Zn	2	Band (Trial)	Zn	0	
Fe			Fe			Fe		
Mn			Mn			Mn		
Cu			Cu			Cu		
Mg			Mg			Mg		
Lime			Lime			Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
5.8							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 16 K2O = 20 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 8 C-STORE
SAMPLE
CNTY CORSON
TWP 21-27
SEC 6 QTR ACRES 73.3
PREV. CROP Barley

REF# 8163109 LAB# 24526 BOX# 856

Field Location

N / W / E / S — 1 mile

SUBMITTED FOR:

WOLFS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
67642

Date Sampled:		Date Received:	7/15/2011	Date Reported:	7/18/2011

NUTRIENT IN SOIL		INTERPRETATION VLow	Low	Med	High
Nitrate	5 lb/ac 12 lb/ac 17 lb/ac				
Olsen Phosphorus	13 ppm				
Potassium	357 ppm				
Chloride					
Sulfur	24 lb/ac 42 lb/ac				
Boron					
Zinc	0.61 ppm				
Iron					
Manganese					
Copper					
Magnesium					
Calcium					
Sodium					
Org. Matter	2.7 %				
Carbonate					
Soluble Salts	0.24 mmho/cm 0.39 mmho/cm				

	1st CROP CHOICE		2nd CROP CHOICE		3rd CROP CHOICE	
	Corn Grain		Oats		Wheat Spring	
	Yield Goal		Yield Goal		Yield Goal	
	[illegible] BU		100 BU		[illegible] BU	
	SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES	
	Band/Maint.		Band/Maint.		Band/Maint.	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	115		83		91	
P_2O_5	44	Band *	25	Band *	25	Band *
K_2O	10	Band (2x2) *	10	Band (Starter)*	10	Band (Starter)*
Cl						
S	7	Band (Trial)	7	Band (Trial)	7	Band (Trial)
B						
Zn	0		2	Band (Trial)	0	
Fe						
Mn						
Cu						
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)			
			% Ca	% Mg	% K	% Na
6.0						

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD	TRANSFORMERS 9
SAMPLE	1
CNTY	CORSON
TWP	21-27
SEC	7 QTR 300.1 ACRES 0
PREV. CROP	Wheat-Spring

REF# 8163137 LAB# 42511 BOX# 2534

Field Location

N / W / E / S — 1 mile

SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/8/2011	Date Reported:	9/9/2011

NUTRIENT IN SOIL		INTERPRETATION VLow	Low	Med	High
Nitrate 0-6" / 6-24" / 0-24"	16 lb/ac 12 lb/ac 28 lb/ac				
Olsen Phosphorus	17 ppm				
Potassium	289 ppm				
Chloride					
Sulfur	6 lb/ac 6 lb/ac				
Boron					
Zinc	0.51 ppm				
Iron					
Manganese					
Copper					
Magnesium					
Calcium					
Sodium					
Org. Matter	2.8 %				
Carbonate					
Soluble Salts	0.34 mmho/cm 0.3 mmho/cm				

	1st CROP CHOICE		2nd CROP CHOICE		3rd CROP CHOICE	
Crop	Corn Grain		Corn Grain		Sunflower	
Yield Goal	100 BU		120 BU		2000 LBS	
SUGGESTED GUIDELINES	Band/Maint		Band/Maint		Band/Maint	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	92		116		72	
P_2O_5	40	Band *	48	Band *	18	Band *
K_2O	10	Band (2x2) *	10	Band (2x2) *	0	
Cl						
S	12	Band	12	Band	12	Band
B						
Zn	2	Band	2	Band	2	Band (Trail)
Fe						
Mn						
Cu						
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) Ca	Mg	K	Na	H
6.5							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

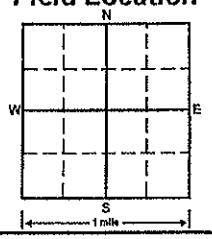
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 10 + 11 SAMPLE 7
CNTY CORSON
TWP 21-27 SECTION 8
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162647
LAB# 2269
BOX# 622

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
Nitrate 0-6"	18 lb/ac	****	***		
6-24"	42 lb/ac				
0-24"	60 lb/ac				
Olsen Phosphorus	19 ppm	****	****	****	****
Potassium	342 ppm	****	****	****	****
Chloride 0-24"	12 lb/ac	***			
Sulfur 0-6"	12 lb/ac	****	***		
6-24"	24 lb/ac	****	**		
Boron					
Zinc					
Iron					
Manganese					
Copper	0.65 ppm	****	****	****	**
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
Sol. Salts 0-6"	0.36 mmho/cm	****	**		
6-24"	0.33 mmho/cm	****	**		

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	48	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	28	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	60	
P_2O_5	15	Band (2x2) *
K_2O	10	Band (2x2) *
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	40	
P_2O_5	12	Band *
K_2O	0	
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.8							

Crop 1: 61 lbs of 0-0-60 = 28 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 61 lbs of 0-0-60 = 28 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 61 lbs of 0-0-60 = 28 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

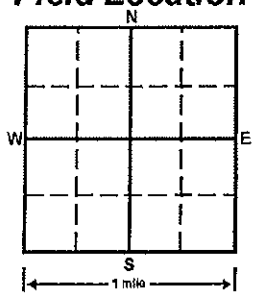
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8163141 LAB# 42528 BOX# 2576

FIELD AIRPORT 12413
SAMPLE 5
CNTY CORSON
TWP 21-27
SEC 9 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/8/2011	Date Reported:	9/9/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" Nitrate 6-24" Nitrate 0-24" Nitrate	29 lb/ac 36 lb/ac 65 lb/ac	******	******	*	
Olsen Phosphorus	11 ppm	******	******	******	
Potassium	248 ppm	******	******	******	******
Chloride					
0-6" Sulfur 6-24" Sulfur	104 lb/ac 66 lb/ac	******	******	******	******
Boron					
Zinc	0.84 ppm	******	******	****	
Iron					
Manganese					
Copper					
Magnesium					
Calcium					
Sodium					
Org. Matter	3.5 %	******	******	**	
Carbonate					
0-6" Soil Salts 6-24" Soil Salts	0.5 mmho/cm 0.36 mmho/cm	******	******	**	

1st CROP CHOICE			2nd CROP CHOICE			3rd CROP CHOICE		
Corn-Grain			Corn-Grain			Sunflower		
Yield Goal			Yield Goal			Yield Goal		
100 BU			120 BU			2000 LBS		
SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES		
Band/Maint.			Band/Maint.			Band/Maint.		
LB/ACRE		APPLICATION	LB/ACRE		APPLICATION	LB/ACRE		APPLICATION
N	55		N	79		N	35	
P_2O_5	40	Band *	P_2O_5	48	Band *	P_2O_5	19	Band *
K_2O	27	Band *	K_2O	32	Band *	K_2O	22	Band *
Cl			Cl			Cl		
S	0		S	0		S	0	
B			B			B		
Zn	0		Zn	0		Zn	2	Band (Trial)
Fe			Fe			Fe		
Mn			Mn			Mn		
Cu			Cu			Cu		
Mg			Mg			Mg		
Lime	0		Lime	0		Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.6							

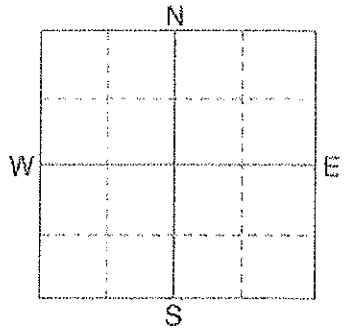
Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 14+15
SAMPLE ID **27**
COUNTY **CORSON**
TWP **22-27**
SECTION **9** QTR ACRES **0**
PREV. CROP **Sunflower**



SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: **SO0453**
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # **11234718** BOX # **0**
LAB # **NW180933**

Date Sampled | Date Received **12/12/2011** | Date Reported **1/17/2012**

Nutrient In The Soil		Interpretations
Nitrate 0-6"	21 lb/ac	
Nitrate 6-24"	15 lb/ac	
Nitrate 0-24"	36 lb/ac	
Phosphorus Olsen	8 ppm	
Potassium	381 ppm	
Chloride 0-24"	28 lb/ac	
Sulfur 0-6"	24 lb/ac	
Sulfur 6-24"	360 +lb/ac	
Boron		
Zinc		
Iron		
Manganese		
Copper	0.69 ppm	
Magnesium		
Calcium		
Sodium		
Org.Matter		
Carbonate(CCE)		
Sol. Salts 0-6"	0.35 mmho/cm	
Sol. Salts 6-24"	1.69 mmho/cm	

1st Crop Choice		
Wheat-Spring		
YIELD GOAL		
40	BU	
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	72	
P_2O_5	23	Band *
K_2O	10	Band (Starter)*
Cl	12	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd Crop Choice		
Corn-Grain		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	84	
P_2O_5	35	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0	

3rd Crop Choice		
Oats		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	64	
P_2O_5	26	Band *
K_2O	10	Band (Starter)*
Cl	12	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.4							

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

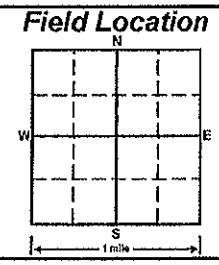
Crop 3: 26 lbs of 0-0-60 = 12 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES
Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 16 SAMPLE 3
CNTY CORSON
TWP 22-27 SECTION 10
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162663
LAB# 2500
BOX# 679

Date Sampled:	2/24/2010	Date Received:	3/1/2010	Date Reported:	3/2/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
Nitrate	0-6" 32 lb/ac 6-24" 36 lb/ac 0-24" 68 lb/ac	****	***		
Olsen Phosphorus	42 ppm	****	****	****	****
Potassium	600 ppm	****	****	****	****
Chloride	0-24" 48 lb/ac	****	****	****	*
Sulfur	0-6" 20 lb/ac 6-24" 54 lb/ac	**** ****	**** ****	** **	
Boron					
Zinc					
Iron					
Manganese					
Copper	0.78 ppm	****	****	****	****
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
Sol. Salts	0-6" 0.45 mmho/cm 6-24" 0.3 mmho/cm	**** ****	*** **		

1ST CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	52	
P_2O_5	15	Band (2x2) *
K_2O	10	Band (2x2) *
Cl	0	
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	40	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	0	
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	32	
P_2O_5	10	Band(Starter)*
K_2O	0	
Cl	0	
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
7.1							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

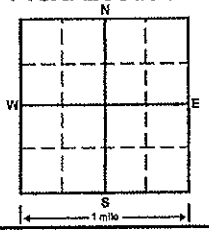
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD	/7	SAMPLE	18
CNTY	CORSON		
TWP	21-26	SECTION	13
QTR		ACRES	
PREV. CROP	Corn-Grain		

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162658
LAB# 2280
BOX# 622

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION VLow	Low	Med	High
Nitrate	0-6" 15 lb/ac 6-24" 45 lb/ac 0-24" 60 lb/ac	****	***		
Olsen Phosphorus	20 ppm	****	****	****	****
Potassium	376 ppm	****	****	****	****
Chloride	0-24" 4 lb/ac	**			
Sulfur	0-6" 12 lb/ac 6-24" 18 lb/ac	**** ****	***		
Boron					
Zinc					
Iron					
Manganese					
Copper	23.89 ppm	****	****	****	****
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
Sol. Salts	0-6" 0.39 mmho/cm 6-24" 0.35 mmho/cm	**** ****	*** **		

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	48	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	36	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	60	
P_2O_5	15	Band (2x2) *
K_2O	10	Band (2x2) *
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	40	
P_2O_5	12	Band *
K_2O	0	
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
7.2							

Crop 1: 79 lbs of 0-0-60 = 36 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 79 lbs of 0-0-60 = 36 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 79 lbs of 0-0-60 = 36 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

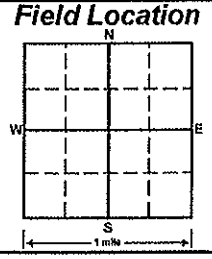
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD	18+19	SAMPLE	5
CNTY	CORSON		
TWP	22-27	SECTION	15
QTR		ACRES	
PREV. CROP	Corn-Grain		

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162665
LAB# 2496
BOX# 681

Date Sampled:	2/24/2010	Date Received:	3/1/2010	Date Reported:	3/2/2010

NUTRIENT IN THE SOIL		INTERPRETATION VLow	Low	Med	High
Nitrate	0-6" 12 lb/ac 6-24" 18 lb/ac 0-24" 30 lb/ac	***			
Olsen Phosphorus	14 ppm	****	****	****	***
Potassium	294 ppm	****	****	****	****
Chloride	0-24" 56 lb/ac	****	****	****	***
Sulfur	0-6" 12 lb/ac 6-24" 48 lb/ac	**** ****	*** ****	*	
Boron					
Zinc					
Iron					
Manganese					
Copper	0.57 ppm	****	****	***	
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
Sol. Salts	0-6" 0.25 mmho/cm 6-24" 0.29 mmho/cm	**** ****	*		

1ST CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	90	
P_2O_5	19	Band *
K_2O	10	Band (2x2) *
Cl	0	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	78	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	0	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	70	
P_2O_5	16	Band *
K_2O	0	
Cl	0	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
6.4							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

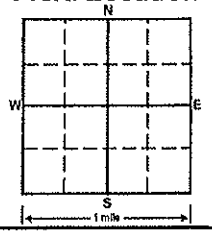
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 20 SAMPLE 4
CNTY CORSON
TWP 22-27 SECTION 16
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162664
LAB# 2501
BOX# 681

Date Sampled:	2/24/2010	Date Received:	3/1/2010	Date Reported:	3/2/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" Nitrate	20 lb/ac	****	**		
6-24" Nitrate	24 lb/ac				
0-24" Nitrate	44 lb/ac				
Olsen Phosphorus	22 ppm	****	****	****	****
Potassium	389 ppm	****	****	****	****
0-24" Chloride	24 lb/ac	****	***		
0-6" Sulfur	12 lb/ac	****	***		
6-24" Sulfur	36 lb/ac	****	***		
Boron					
Zinc					
Iron					
Manganese					
Copper	0.65 ppm	****	****	****	**
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
0-6" Sol. Salts	0.32 mmho/cm	****	**		
6-24" Sol. Salts	0.25 mmho/cm	****			

1ST CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	76	
P_2O_5	15	Band (2x2) *
K_2O	10	Band (2x2) *
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	64	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	16	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	56	
P_2O_5	10	Band(Starter)*
K_2O	0	
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.7							

Crop 1: 35 lbs of 0-0-60 = 16 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 35 lbs of 0-0-60 = 16 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 35 lbs of 0-0-60 = 16 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * No credits have been given for applied manure. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

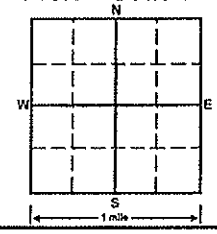
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 21 SAMPLE 6
CNTY CORSON
TWP 22-27 SECTION 19
QTR ACRES
PREV. CROP Corn-Grain

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162646
LAB# 2268
BOX# 622

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" / 6-24" / 0-24" Nitrate	10 lb/ac / 18 lb/ac / 28 lb/ac	***			
Olsen Phosphorus	9 ppm	****	****	**	
Potassium	296 ppm	****	****	****	****
0-24" Chloride	28 lb/ac	****	***		
0-6" / 6-24" Sulfur	12 lb/ac / 42 lb/ac	**** / ****	*** / ****		
Boron					
Zinc					
Iron					
Manganese					
Copper	0.57 ppm	****	****	***	
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
0-6" / 6-24" Sol. Salts	0.2 mmho/cm / 0.28 mmho/cm	*** / ****	*		

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	80	
P_2O_5	22	Band *
K_2O	10	Band(Starter)*
Cl	12	Band
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	92	
P_2O_5	32	Band *
K_2O	10	Band (2x2) *
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	72	
P_2O_5	20	Band *
K_2O	0	
Cl	**	
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.3							

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 26 lbs of 0-0-60 = 12 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 26 lbs of 0-0-60 = 12 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

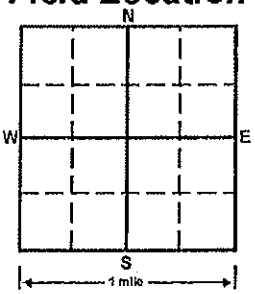
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8164774 LAB# 25619 BOX# 920

FIELD 22
SAMPLE 6
CNTY CORSON
TWP 22-27
SEC 30 QTR SE ACRES 0
PREV. CROP Oats

Field Location



SUBMITTED FOR:

WOLF

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:	7/21/2011	Date Received:	7/25/2011	Date Reported:	7/26/2011

NUTRIENT IN SOIL		INTERPRETATION			
		Very Low	Low	Med	High
Nitrate	0-6": 10 lb/ac 6-24": 18 lb/ac 0-24": 28 lb/ac	*****			
Olsen Phosphorus	19 ppm	*****	*****	*****	*****
Potassium	347 ppm	*****	*****	*****	*****
0-24" Chloride	20 lb/ac	*****	**		
Sulfur	0-6": 8 lb/ac 6-24": 360 +lb/ac	*****	*	*****	*****
Boron	0.5 ppm	*****	**		
Zinc	1.47 ppm	*****	*****	*****	***
Iron	44.1 ppm	*****	*****	*****	*****
Manganese	9.0 ppm	*****	*****	*****	*****
Copper	0.67 ppm	*****	*****	***	
Magnesium	704 ppm	*****	*****	*****	*****
Calcium	2327 ppm	*****	*****	*****	*****
Sodium	33 ppm	*****			
Org. Matter	3.2 %	*****	*****		
Carbonate	0.0 %				
Sol. Salts	0-6": 0.24 mmho/cm 6-24": 1.08 mmho/cm	*****	*****	*****	**

1st CROP CHOICE		
Barley-Malting		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	34	
P_2O_5	19	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	0	
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	1	Band (Trial)
Mg	0	
Lime	0	

2nd CROP CHOICE		
Wheat-Spring		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	80	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	0	
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	1	Band (Trial)
Mg	0	
Lime	0	

3rd CROP CHOICE		
Corn-Grain		
Yield Goal		
110 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	104	
P_2O_5	44	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	0	
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	0	
Mg	0	
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.3		18.5 meq	(65-75) 62.8	(15-20) 31.7	(1-7) 4.8	(0-5) 0.8	(0-5)

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 19 K2O = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

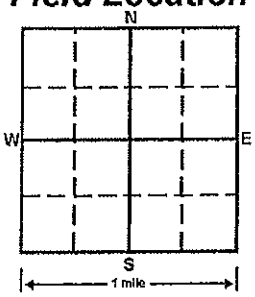
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8164773 LAB# 25618 BOX# 990

FIELD 23
SAMPLE 5
CNTY CORSON
TWP 22-27
SEC 31 QTR N1/2 ACRES 0
PREV. CROP Oats

Field Location



SUBMITTED FOR:

WOLF

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:	7/21/2011	Date Received:	7/25/2011	Date Reported:	7/26/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" 6-24" 0-24" Nitrate	9 lb/ac 15 lb/ac 24 lb/ac	*****			
Olsen Phosphorus	24 ppm	******	******	******	******
Potassium	332 ppm	******	******	******	******
0-24" Chloride	20 lb/ac	******	**		
0-6" 6-24" Sulfur	6 lb/ac 24 lb/ac	****** ******	******	****	
Boron	0.5 ppm	******	**		
Zinc	1.27 ppm	******	******	******	**
Iron	46.5 ppm	******	******	******	******
Manganese	8.2 ppm	******	******	******	******
Copper	0.64 ppm	******	******	**	
Magnesium	780 ppm	******	******	******	******
Calcium	2328 ppm	******	******	******	******
Sodium	40 ppm	******			
Org. Matter	3.4 %	******	******	*	
Carbonate	0.1 %	*			
0-6" 6-24" Soil Salts	0.38 mmho/cm 0.33 mmho/cm	****** ******	*** **		

1st CROP CHOICE		
Barley-Malting		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	38	
P_2O_5	19	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	10	Band
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	1	Band (Trial)
Mg	0	
Lime	0	

2nd CROP CHOICE		
Wheat-Spring		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	84	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	10	Band
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	1	Band (Trial)
Mg	0	
Lime	0	

3rd CROP CHOICE		
Corn-Grain		
Yield Goal		
110 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	108	
P_2O_5	44	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	10	Band
B	0	
Zn	0	
Fe	0	
Mn	0	
Cu	0	
Mg	0	
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.2		19.2 meq	(65-75) 60.7	(15-20) 33.9	(1-7) 4.4	(0-5) 0.9	(0-5)

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 19 K2O = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

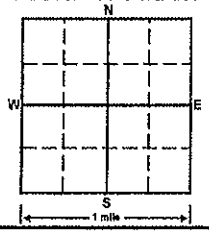
Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 24
CNTY CORSON
TWP 22-27
QTR
PREV. CROP Oats

SAMPLE 2
SECTION 31
ACRES

Field Location



SUBMITTED FOR:
CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD
57642

REF# 8162642
LAB# 2264
BOX# 622

Date Sampled:	2/15/2010	Date Received:	2/18/2010	Date Reported:	2/19/2010

NUTRIENT IN THE SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6" 6-24" 0-24" Nitrate	25 lb/ac 60 lb/ac 85 lb/ac	****	****	**	
Olsen Phosphorus	38 ppm	****	****	****	****
Potassium	525 ppm	****	****	****	****
0-24" Chloride	36 lb/ac	****	****	**	
0-6" 6-24" Sulfur	16 lb/ac 42 lb/ac	**** ****	**** ****	*	
Boron					
Zinc					
Iron					
Manganese					
Copper	0.87 ppm	****	****	****	****
Magnesium					
Calcium					
Sodium					
Org.Matter					
Carbonate(CCE)					
0-6" 6-24" Sol. Salts	0.4 mmho/cm 0.5 mmho/cm	**** ****	*** ****		

1ST CROP CHOICE		
Wheat-Spring		
YIELD GOAL		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	25	
P_2O_5	15	Band(Starter)*
K_2O	10	Band(Starter)*
Cl	4	Band
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

2ND CROP CHOICE		
Corn-Grain		
YIELD GOAL		
100 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	35	
P_2O_5	15	Band (2x2) *
K_2O	10	Band (2x2) *
Cl	**	
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

3RD CROP CHOICE		
Sunflower		
YIELD GOAL		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	15	
P_2O_5	10	Band(Starter)*
K_2O	0	
Cl	**	
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.0							

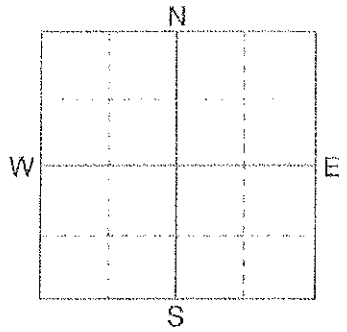
Crop 1: 8 lbs of 0-0-60 = 4 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Nitrogen Guidelines have been adjusted because most of the Nitrgen in this field is deep. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: 8 lbs of 0-0-60 = 4 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 3: 8 lbs of 0-0-60 = 4 lbs of Chloride * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 15, 26
SAMPLE ID 1A 1B
COUNTY CORSON
TWP 22-26
SECTION 34 QTR ACRES 308
PREV. CROP Sunflower



SUBMITTED FOR:
WULF CATTLE COMPANY

SUBMITTED BY: MZ1154
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57647

REF # 11234893 BOX # 0
LAB # NW3077

Date Sampled 01/19/2012 Date Received 01/23/2012 Date Reported 1/24/2012

Nutrient In The Soil		Interpretation
0-6" / 6-24" Nitrate	16 lb/ac / 12 lb/ac	
0-24" Nitrate	28 lb/ac	
Olsen Phosphorus	7 ppm	
Potassium	395 ppm	
0-24" Chloride	16 lb/ac	
0-6" / 6-24" Sulfur	8 lb/ac / 90 lb/ac	
Boron		
Zinc		
Iron		
Manganese		
Copper	0.65 ppm	
Magnesium		
Calcium		
Sodium		
Org Matter		
Carbonate(CCE)		
0-6" / 6-24" Soil Salts	0.25 mmho/cm / 0.6 mmho/cm	

1st Crop Choice		
Oats		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	72	
P_2O_5	27	Band *
K_2O	10	Band (Starter)*
Cl	24	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd Crop Choice		
Barley-Malting		
YIELD GOAL		
50	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	50	
P_2O_5	24	Band *
K_2O	10	Band (Starter)*
Cl	24	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

3rd Crop Choice		
Corn-Grain		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	92	
P_2O_5	40	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.1							

Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 24 K2O = 25 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

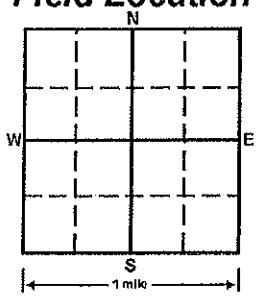
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8164769 LAB# 25620 BOX# 959

FIELD 27
SAMPLE 1
CNTY CORSON
TWP 22-27
SEC 34 QTR NW ACRES 0
PREV. CROP Oats

Field Location



SUBMITTED FOR:

WOLF

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:	7/21/2011	Date Received:	7/25/2011	Date Reported:	7/26/2011

NUTRIENT IN SOIL		INTERPRETATION				1st CROP CHOICE			2nd CROP CHOICE			3rd CROP CHOICE		
		VLow	Low	Med	High	Barley-Malting			Wheat-Spring			Corn-Grain		
						Yield Goal			Yield Goal			Yield Goal		
						40 BU			40 BU			110 BU		
						SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES		
						Band/Maint.			Band/Maint.			Band/Maint.		
0-6"	13 lb/ac	*****				LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION	
6-24"	12 lb/ac					N 37			N 83			N 107		
0-24" Nitrate	25 lb/ac					P_2O_5 19	Band *		P_2O_5 25	Band *		P_2O_5 44	Band *	
Olsen Phosphorus	8 ppm	*****	*****			K_2O 10	Band (Starter)*		K_2O 10	Band (Starter)*		K_2O 10	Band (2x2) *	
Potassium	274 ppm	*****	*****	*****	*****	Cl 8			Cl 8			Cl	Not Available	
0-24" Chloride	32 lb/ac	*****	*****	*		S 9	Band (Trial)		S 9	Band (Trial)		S 9	Band (Trial)	
0-6"	8 lb/ac	*****	*			B 1	Broadcast		B 1	Broadcast		B 1	Broadcast	
6-24" Sulfur	12 lb/ac	*****	****			Zn 0			Zn 0			Zn 0		
Boron	0.4 ppm	*****				Fe 0			Fe 0			Fe 0		
Zinc	0.74 ppm	*****	*****	**		Mn 0			Mn 0			Mn 0		
Iron	33.6 ppm	*****	*****	*****	*****	Cu 1	Band (Trial)		Cu 1	Band (Trial)		Cu 0		
Manganese	8.2 ppm	*****	*****	*****	*****	Mg 0			Mg 0			Mg 0		
Copper	0.57 ppm	*****	*****	*		Lime 0			Lime 0			Lime 0		
Magnesium	504 ppm	*****	*****	*****	*****									
Calcium	1797 ppm	*****	*****	*****	****									
Sodium	19 ppm	***												
Org. Matter	2.5 %	*****	****											
Carbonate	0.0 %													
0-6"	0.25 mmho/cm	*****												
6-24" Sol. Salts	0.24 mmho/cm	*****												

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.1		14.0 meq	(65-75) 64.3	(15-20) 30.1	(1-7) 5.0	(0-5) 0.6	(0-5)

Crop 1: 17 lbs of 0-0-60 = 8 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 19 K2O = 20AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 17 lbs of 0-0-60 = 8 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 44 K2O = 30AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

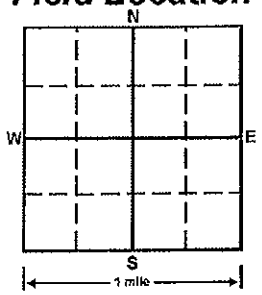
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8163140 LAB# 42525 BOX# 2576

FIELD TAYLOR HILL , 28
SAMPLE 4
CNTY CORSON
TWP 22-27
SEC 34 QTR 254.65 ACRES 0
PREV. CROP Oats

Field Location



SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/8/2011	Date Reported:	9/9/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
Nitrate	0-6" 30 lb/ac 6-24" 21 lb/ac 0-24" 51 lb/ac	******	****		
Phosphorus Olsen	32 ppm	******	******	******	******
Potassium	572 ppm	******	******	******	******
Chloride					
Sulfur	0-6" 26 lb/ac 6-24" 36 lb/ac	******	******	****	**
Boron					
Zinc	1.41 ppm	******	******	******	**
Iron					
Manganese					
Copper					
Magnesium					
Calcium					
Sodium					
Org. Matter	3.1 %	******	******		
Carbonate					
Soil Salts	0-6" 0.36 mmho/cm 6-24" 0.23 mmho/cm	******	**		

1st CROP CHOICE			2nd CROP CHOICE			3rd CROP CHOICE		
Sunflower			Corn-Grain			Wheat-Spring		
Yield Goal			Yield Goal			Yield Goal		
2000 LBS			100 BU			40 BU		
SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES		
Band/Maint.			Band/Maint.			Band/Maint.		
	LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION
N	49		N	69		N	57	
P_2O_5	18	Band *	P_2O_5	40	Band *	P_2O_5	25	Band *
K_2O	0		K_2O	10	Band (2x2) *	K_2O	10	Band (Starter)*
Cl			Cl			Cl		
S	5	Band (Trial)	S	5	Band (Trial)	S	5	Band (Trial)
B			B			B		
Zn	0		Zn	2	Band (Trial)	Zn	0	
Fe			Fe			Fe		
Mn			Mn			Mn		
Cu			Cu			Cu		
Mg			Mg			Mg		
Lime	0		Lime	0		Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.2							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID	**4-20-25** or Field 29
SAMPLE ID	**44**
COUNTY	**CORSON**
TWP	**21-25**
SECTION	**32** QTR ACRES **0**
PREV. CROP	**Sunflower**

N / W / E / S

SUBMITTED FOR:	SUBMITTED BY: S00453
CORSON COUNTY FEEDERS	**SD WHT GROWERS-MCLAUGHLIN** **109 ELEVATOR ROAD** **BOX 640** **MCLAUGHLIN, SD 57642**

REF #	**11234743**	BOX #	**0**
LAB #	**NW181635**		

Date Sampled   Date Received **12/14/2011**   Date Reported **12/29/2011**

Nutrient In The Soil

Nutrient	Depth	Result	Interpretation (VLow / Low / Med / High)
Nitrate	[illegible]	8 lb/ac	[illegible]
	[illegible]	12 lb/ac	
	0-24"	20 lb/ac	
Phosphorus	Olsen	12 ppm	[illegible]
Potassium		280 ppm	[illegible]
Chloride	0-24"	12 lb/ac	[illegible]
Sulfur	0-6"	4 lb/ac	[illegible]
	6-24"	6 lb/ac	
Boron			
Zinc			
Iron			
Manganese			
Copper		0.36 ppm	[illegible]
Magnesium			
Calcium			
Sodium			
Org.Matter			
Carbonate(CCE)			
Soluble Salts	[illegible]	0.13 mmho/cm	[illegible]
	[illegible]	0.25 mmho/cm	

Crop Choices

	1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
Crop	Wheat-Spring		Wheat-Spring		Wheat-Spring	
YIELD GOAL	30	Bushels	40	Bushels	50	Bushels
SUGGESTED GUIDELINES	Band		Band		Band	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	61		88		115	
P_2O_5	16	Band (Starter)*	18	Band *	23	Band *
K_2O	10	Band (Starter)*	10	Band (Starter)*	10	Band (Starter)*
Cl	28	Broadcast	28	Broadcast	28	Broadcast
S	10	Band	10	Band	10	Band
B						
Zn						
Fe						
Mn						
Cu	2	Band	2	Band	2	Band
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
6.0							

Crop 1: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 19 K2O = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 31 K2O = 19 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

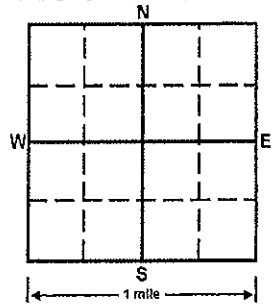
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8163510 LAB# 55763 BOX# 3925

FIELD 30, 31, 32
SAMPLE 2
CNTY CARSON
TWP 21-26
SEC 4 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

WULF CATTLE CO.

MCLAUGHLIN, SD

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/19/2011	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION VLow	Low	Med	High
0-6" 6-24" 0-24" Nitrate	17 lb/ac 15 lb/ac 32 lb/ac	******			
Olsen Phosphorus	7 ppm	******	******		
Potassium	333 ppm	******	******	******	******
0-24" Chloride	20 lb/ac	******	**		
0-6" 6-24" Sulfur	26 lb/ac 360 +lb/ac	****** ******	****** ******	**** ******	******
Boron					
Zinc					
Iron					
Manganese					
Copper	0.58 ppm	******	******	*	
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6" 6-24" Sol. Salts	0.38 mmho/cm 1.09 mmho/cm	****** ******	*** ******	******	**

1st CROP CHOICE		
Oats		
Yield Goal		
100 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	68	
P_2O_5	27	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd CROP CHOICE		
Corn-Grain		
Yield Goal		
100 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	88	
P_2O_5	40	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0	

3rd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	68	
P_2O_5	22	Band *
K_2O	0	
Cl		Not Available
S	0	
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range) % Ca	% Mg	% K	% Na	% H
6.9							

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 19AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

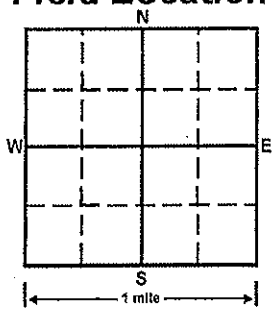
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8164469 LAB# 2247 BOX# 0

FIELD 1 33, 34
SAMPLE
CNTY CORSON
TWP 21-26
SEC 7 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

BACHMIER FARMS

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	2/13/2009	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION VLow	Low	Med	High
0-6"	22 lb/ac				
6-24"	63 lb/ac				
0-24"	85 lb/ac	******	******	*****	
Nitrate					
Olsen Phosphorus	10 ppm	******	******	****	
Potassium	339 ppm	******	******	******	******
0-24" Chloride	28 lb/ac	******	*****		
0-6"	20 lb/ac	******	******	**	
6-24" Sulfur	24 lb/ac	******	******	****	
Boron					
Zinc					
Iron					
Manganese					
Copper	0.55 ppm	******	******	*	
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6"	0.28 mmho/cm	******	*		
6-24" Sol. Salts	0.29 mmho/cm	******	*		

1st CROP CHOICE		
Wheat-Spring		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	28	
P_2O_5	21	Band *
K_2O	10	Band (Starter)*
Cl	12	Broadcast
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	15	
P_2O_5	20	Band *
K_2O	0	
Cl		Not Available
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

3rd CROP CHOICE		
Yield Goal		
SUGGESTED GUIDELINES		
LB/ACRE		APPLICATION
N		
P_2O_5		
K_2O		
Cl		
S		
B		
Zn		
Fe		
Mn		
Cu		
Mg		
Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range) % Ca	% Mg	% K	% Na	% H
6.0							

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

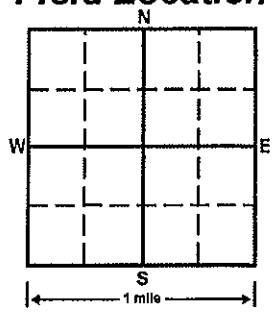
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD 35
SAMPLE
CNTY CORSON
TWP 21-25
SEC 10 QTR ACRES 0
PREV. CROP Wheat-Spring

REF# 8164472 LAB# 2250 BOX# 0

Field Location



SUBMITTED FOR:

BACHMIER FARMS

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	2/13/2009	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6"	15 lb/ac				
6-24"	48 lb/ac				
0-24" Nitrate	63 lb/ac	******	******		
Olsen Phosphorus	8 ppm	******	******		
Potassium	424 ppm	******	******	******	******
0-24" Chloride	24 lb/ac	******	***		
0-6"	14 lb/ac	******	******		
6-24" Sulfur	48 lb/ac	******	******	******	******
Boron					
Zinc					
Iron					
Manganese					
Copper	0.63 ppm	******	******	**	
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6"	0.38 mmho/cm	******	***		
6-24" Sol. Salts	0.55 mmho/cm	******	******	*	

1st CROP CHOICE			2nd CROP CHOICE			3rd CROP CHOICE		
Wheat-Spring			Sunflower					
Yield Goal			Yield Goal			Yield Goal		
40 BU			2000 LBS					
SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES		
Band			Band					
LB/ACRE		APPLICATION	LB/ACRE		APPLICATION	LB/ACRE		APPLICATION
N	45		N	37		N		
P_2O_5	23	Band *	P_2O_5	22	Band *	P_2O_5		
K_2O	10	Band (Starter)*	K_2O	0		K_2O		
Cl	16	Broadcast	Cl		Not Available	Cl		
S	7	Band (Trial)	S	7	Band (Trial)	S		
B			B			B		
Zn			Zn			Zn		
Fe			Fe			Fe		
Mn			Mn			Mn		
Cu	1	Band (Trial)	Cu	1	Band (Trial)	Cu		
Mg			Mg			Mg		
Lime			Lime			Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range)				
			% Ca	% Mg	% K	% Na	% H
7.0							

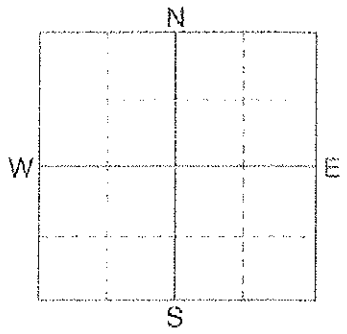
Crop 1: 35 lbs of 0-0-60 = 16 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 36
SAMPLE ID **4A 4B**
COUNTY **CORSON**
TWP **21N-25E**
SECTION **10** QTR ACRES **159**
PREV. CROP **Sunflower**



SUBMITTED FOR:
WULF CATTLE COMPANY

SUBMITTED BY: **MZ1154**
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57647

REF # **11234896** BOX # **0**
LAB # **NW3080**

Date Sampled **01/19/2012** Date Received **01/23/2012** Date Reported **1/24/2012**

Nutrient In The Soil		Interpretation
Nitrate 0-6"	8 lb/ac	
Nitrate 6-24"	6 lb/ac	
Nitrate 0-24"	14 lb/ac	
Phosphorus Olsen	23 ppm	
Potassium	576 ppm	
Chloride 0-24"	8 lb/ac	
Sulfur 0-6"	10 lb/ac	
Sulfur 6-24"	24 lb/ac	
Boron		
Zinc		
Iron		
Manganese		
Copper	0.5 ppm	
Magnesium		
Calcium		
Sodium		
Org.Matter		
Carbonate(CCE)		
Sol. Salts 0-6"	0.2 mmho/cm	
Sol. Salts 6-24"	0.32 mmho/cm	

1st Crop Choice		
Oats		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	86	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	32	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd Crop Choice		
Barley-Malting		
YIELD GOAL		
50	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	64	
P_2O_5	24	Band *
K_2O	10	Band (Starter)*
Cl	32	Broadcast
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	2	Band
Mg		
Lime	0	

3rd Crop Choice		
Corn-Grain		
YIELD GOAL		
100	BU	
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	106	
P_2O_5	40	Band *
K_2O	10	Band (2x2) *
Cl		Not Available
S	7	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	0	
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.2							

Crop 1: 70 lbs of 0-0-60 = 32 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 19 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 70 lbs of 0-0-60 = 32 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 24 K2O = 25 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 3: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

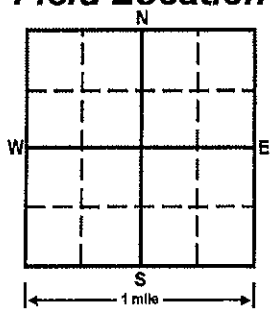
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8164471 LAB# 2249 BOX# 0

FIELD 37
SAMPLE
CNTY CORSON
TWP 21-25
SEC 11 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

BACHMIER FARMS

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	2/13/2009	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6"	17 lb/ac				
6-24"	39 lb/ac				
0-24"	56 lb/ac	******	*****		
Nitrate					
Olsen Phosphorus	13 ppm	******	******	******	**
Potassium	516 ppm	******	******	******	******
0-24" Chloride	28 lb/ac	******	*****		
0-6"	16 lb/ac	******	******		
6-24"	30 lb/ac	******	******	******	
Sulfur					
Boron					
Zinc					
Iron					
Manganese					
Copper	0.65 ppm	******	******	***	
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6"	0.38 mmho/cm	******	***		
6-24"	0.38 mmho/cm	******	***		
Sol. Salts					

1st CROP CHOICE		
Wheat-Spring		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	52	
P_2O_5	17	Band *
K_2O	10	Band (Starter)*
Cl	12	Broadcast
S	5	Bend (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

2nd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band		
LB/ACRE		APPLICATION
N	44	
P_2O_5	18	Band *
K_2O	0	
Cl		Not Available
S	5	Band (Trial)
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

3rd CROP CHOICE		
Yield Goal		
SUGGESTED GUIDELINES		
LB/ACRE		APPLICATION
N		
P_2O_5		
K_2O		
Cl		
S		
B		
Zn		
Fe		
Mn		
Cu		
Mg		
Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.7							

Crop 1: 26 lbs of 0-0-60 = 12 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

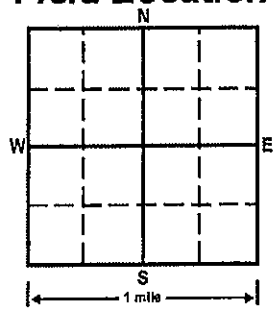
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8162968 LAB# 127096 BOX# 3973

FIELD 38
SAMPLE 4
CNTY CARSON
TWP 21-25
SEC 12 QTR ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

BACHMIER FARMS

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:	10/21/2010	Date Received:	10/25/2010	Date Reported:	11/11/2011

NUTRIENT IN SOIL		INTERPRETATION			
		VLow	Low	Med	High
0-6"	6 lb/ac				
6-24"	6 lb/ac				
0-24"	12 lb/ac	**			
Nitrate					
Olsen Phosphorus	8 ppm	******	******		
Potassium	334 ppm	******	******	******	******
0-24" Chloride	20 lb/ac	******	**		
0-6"	4 lb/ac	****			
6-24"	36 lb/ac	******	******	******	**
Sulfur					
Boron					
Zinc					
Iron					
Manganese					
Copper	0.43 ppm	******	****		
Magnesium					
Calcium					
Sodium					
Org. Matter					
Carbonate					
0-6"	0.18 mmho/cm	****			
6-24"	0.33 mmho/cm	******	**		
Sol. Salts					

1st CROP CHOICE		
Wheat-Spring		
Yield Goal		
40 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	96	
P_2O_5	25	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	2	Band
Mg		
Lime	0	

2nd CROP CHOICE		
Barley-Malting		
Yield Goal		
80 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	112	
P_2O_5	38	Band *
K_2O	10	Band (Starter)*
Cl	20	Broadcast
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	2	Band
Mg		
Lime	0	

3rd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	88	
P_2O_5	22	Band *
K_2O	0	
Cl		Not Available
S	10	Band
B		
Zn		
Fe		
Mn		
Cu	1	Band (Trial)
Mg		
Lime	0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation(Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.4							

Crop 1: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 25 K2O = 15AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride"* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 38 K2O = 40AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

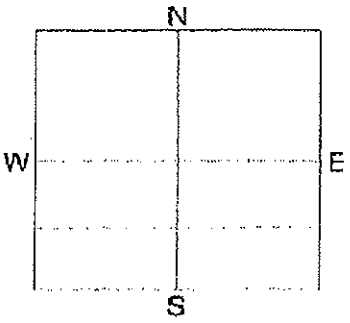
Crop 3: ** Chloride yield data is limited for this crop.* Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 39 Y 23-21-25
SAMPLE ID 36
COUNTY CORSON
TWP 21-25
SECTION 14 QTR ACRES 0
PREV. CROP Corn-Grain



SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234727 BOX # 0
LAB # NW180930

Date Sampled | Date Received 12/12/2011 | Date Reported 12/29/2011

Nutrient In The Soil		Interpretation
		Very Low Low Med High
0-6"	7 lb/ac	
6-24"	9 lb/ac	
0-24"	16 lb/ac	
Nitrate		
Olsen	13 ppm	
Sulfate	376 ppm	
0-24"	20 lb/ac	
0-6"	14 lb/ac	
6-24"	36 lb/ac	
Sulfur		
Boron		
Iron		
Zinc		
Manganese		
Copper	0.68 ppm	
Magnesium		
Calcium		
Sodium		
Chloride		
Soluble Salts		
0-6"	0.22 mmho/cm	
6-24"	0.41 mmho/cm	
Soil Salts		

1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
Sunflower		Wheat-Spring		Sunflower	
YIELD GOAL		YIELD GOAL		YIELD GOAL	
2000	Pounds	40	Bushels	1800	Pounds
SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES	
Band		Band		Band	
LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N 84		N 92		N 74	
P_2O_5 18	Band *	P_2O_5 17	Band *	P_2O_5 16	Band *
K_2O 0		K_2O 10	Band (Starter)*	K_2O 0	
Cl	Not Available	Cl 20	Broadcast	Cl	Not Available
S 7	Band (Trial)	S 7	Band (Trial)	S 7	Band (Trial)
B		B		Mg	
Zn		Zn		Zn	
Fe		Fe		Fe	
Mn		Mn		Mn	
Cu 1	Band (Trial)	Cu 1	Band (Trial)	Cu 1	Band (Trial)
Mo		Mo		Mo	
Na	0	Na 0		Na 0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
6.7							

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 16 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 16 K2O = 20 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

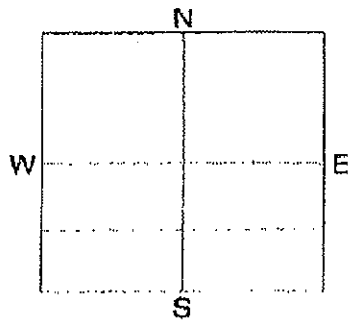
AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 40
SAMPLE ID 36
COUNTY CORSON
TWP 21-25
SECTION 14 QTR ACRES 0
PREV. CROP Corn-Grain

23-21-25



SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234727 BOX # 0
LAB # NW180930

Date Sampled | Date Received 12/12/2011 | Date Reported 12/29/2011

Nutrient In The Soil		Interpretation
	7 lb/ac 9 lb/ac	Low Low Med High
	16 lb/ac	
	13 ppm	
	376 ppm	
	20 lb/ac	
	14 lb/ac 36 lb/ac	
	0.68 ppm	
	0.22 mmho/cm 0.41 mmho/cm	

1st Crop Choice: Sunflower			2nd Crop Choice: Wheat, Spring			3rd Crop Choice: Sunflower		
YIELD GOAL: 2000 Pounds			YIELD GOAL: 40 Bushels			YIELD GOAL: 1800 Pounds		
SUGGESTED GUIDELINES: Band			SUGGESTED GUIDELINES: Band			SUGGESTED GUIDELINES: Band		
	LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION
	84			92			74	
	18	Band *		17	Band *		16	Band *
	0			10	Band (Starter)*		0	
		Not Available		20	Broadcast			Not Available
	7	Band (Trial)		7	Band (Trial)		7	Band (Trial)
	1	Band (Trial)		1	Band (Trial)		1	Band (Trial)
	0			0			0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Optimal Range)				
			% Ca (65-75)	% Mg (10-15)	% K (2-5)	% Na (0-1)	% H (15-20)
6.7							

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 18 K2O = 22 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 44 lbs of 0-0-60 = 20 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 16 K2O = 20 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

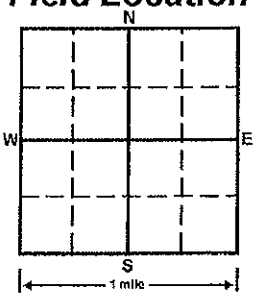
Soil Analysis by: Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

REF# 8163139 LAB# 42519 BOX# 2576

FIELD KAPASTINSKI SOU 41 & 42
SAMPLE 3
CNTY CORSON
TWP 21-26
SEC 24 QTR 158.52 ACRES 0
PREV. CROP Wheat-Spring

Field Location



SUBMITTED FOR:

CORSON COUNTY FEEDERS

MCLAUGHLIN, SD
57642

SUBMITTED BY: SO0453

SD WHT GROWERS-MCLAUGHLIN
BOX 640
MCLAUGHLIN, SD
57642

Date Sampled:		Date Received:	9/8/2011	Date Reported:	9/9/2011

NUTRIENT IN SOIL		INTERPRETATION			
		V.Low	Low	Med	High
Nitrate	0-6" 15 lb/ac 6-24" 24 lb/ac 0-24" 39 lb/ac	******	**		
Olsen Phosphorus	17 ppm	******	******	******	******
Potassium	257 ppm	******	******	******	******
Chloride					
Sulfur	0-6" 10 lb/ac 6-24" 18 lb/ac	******	***		
		******	******	*	
Boron					
Zinc	0.47 ppm	******	***		
Iron					
Manganese					
Copper					
Magnesium					
Calcium					
Sodium					
Org. Matter	2.7 %	******	*****		
Carbonate					
Soil Salts	0-6" 0.18 mmho/cm 6-24" 0.18 mmho/cm	****			
		****			

1st CROP CHOICE		
Corn-Grain		
Yield Goal		
100 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	81	
P_2O_5	40	Band *
K_2O	10	Band (2x2) *
Cl		
S	9	Band (Trial)
B		
Zn	2	Band
Fe		
Mn		
Cu		
Mg		
Lime		

2nd CROP CHOICE		
Corn-Grain		
Yield Goal		
120 BU		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	105	
P_2O_5	48	Band *
K_2O	10	Band (2x2) *
Cl		
S	9	Band (Trial)
B		
Zn	2	Band
Fe		
Mn		
Cu		
Mg		
Lime		

3rd CROP CHOICE		
Sunflower		
Yield Goal		
2000 LBS		
SUGGESTED GUIDELINES		
Band/Maint.		
LB/ACRE		APPLICATION
N	61	
P_2O_5	18	Band *
K_2O	0	
Cl		
S	9	Band (Trial)
B		
Zn	2	Band (Trail)
Fe		
Mn		
Cu		
Mg		
Lime		

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
5.6							

Crop 1: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 40 K2O = 27AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 2: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 48 K2O = 32AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury *Many crops may respond to a starter application of P & K even on high soil tests.Crop Removal: P2O5 = 18 K2O = 22AGVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 5 43
SAMPLE ID 43
COUNTY CORSON
TWP 21-25
SECTION 26 QTR ACRES 0
PREV. CROP Sunflower

35-21-25

N / W / E / S

SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234742 BOX # 0
LAB # NW181634

Date Sampled | Date Received 12/14/2011 | Date Reported 12/29/2011

Nutrient In The Soil		Interpretation (Very Low, Low, Med, High)
Nitrate 0-6"	9 lb/ac	
Nitrate 6-24"	9 lb/ac	
Nitrate 0-24"	18 lb/ac	
Phosphorus Olsen	12 ppm	
Potassium	275 ppm	
Chloride 0-24"	16 lb/ac	
Sulfur 0-6"	8 lb/ac	
Sulfur 6-24"	12 lb/ac	
Boron		
Zinc		
Iron		
Manganese		
Copper	0.56 ppm	
Magnesium		
Calcium		
Sodium		
Org Matter		
Carbonate (CCE)		
Soluble Salts 0-6"	0.23 mmho/cm	
Soluble Salts 6-24"	0.38 mmho/cm	

	1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
Crop	Wheat-Spring		Wheat-Spring		Wheat-Spring	
YIELD GOAL	30 Bushels		40 Bushels		50 Bushels	
SUGGESTED GUIDELINES	Band		Band		Band	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	63		90		117	
P_2O_5	15	Band (Starter)*	18	Band *	23	Band *
K_2O	10	Band (Starter)*	10	Band (Starter)*	10	Band (Starter)*
Cl	24	Broadcast	24	Broadcast	24	Broadcast
S	7	Band (Trial)	7	Band (Trial)	7	Band (Trial)
B						
Zn						
Fe						
Mn						
Cu	1	Band (Trial)	1	Band (Trial)	1	Band (Trial)
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
6.3							

Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 19 K2O = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

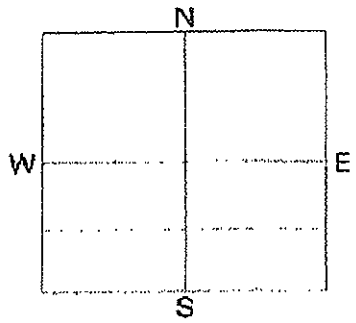
Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 31 K2O = 19 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 44
SAMPLE ID **44**
COUNTY **CORSON**
TWP **21-25**
SECTION **32** QTR ACRES **0**
PREV. CROP **Sunflower**



SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: **S00453**
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # **11234743** BOX # **0**
LAB # **NW181635**

Date Sampled | Date Received **12/14/2011** | Date Reported **12/29/2011**

Nutrient In The Soil		Interpretation
Nitrate-N 0-6"	8 lb/ac	Very Low
Nitrate-N 6-24"	12 lb/ac	Very Low
Nitrate-N 24-60"	20 lb/ac	Very Low
Nitrate-N 0-60"		
Sulfate-S	12 ppm	Very Low
Phosphorus (P)	280 ppm	Very High
Potassium (K)	12 lb/ac	Very Low
Chloride 0-24"	4 lb/ac	Very Low
Chloride 24-60"	6 lb/ac	Very Low
Chloride 0-60"		
Zinc (Zn)		
Iron (Fe)		
Manganese (Mn)		
Copper (Cu)	0.36 ppm	Very High
Boron (B)		
Aluminum (Al)		
Sodium (Na)		
Soluble Salts (ECe)		
Soluble Salts 0-24"	0.13 mmho/cm	Very Low
Soluble Salts 24-60"	0.25 mmho/cm	Very Low

1st Crop Choice: Wheat,Spring		2nd Crop Choice: Wheat,Spring		3rd Crop Choice: Wheat,Spring	
YIELD GOAL: 30 Bushels		YIELD GOAL: 40 Bushels		YIELD GOAL: 50 Bushels	
SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES	
Basic		Basic		Basic	
LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N 61		N 88		N 115	
P2O5 15	Band (Starter)*	P2O5 18	Band *	P2O5 23	Band *
K2O 10	Band (Starter)*	K2O 10	Band (Starter)*	K2O 10	Band (Starter)*
S 28	Broadcast	S 28	Broadcast	S 28	Broadcast
Cl 10	Band	Cl 10	Band	Cl 10	Band
Zn		Zn		Zn	
Fe		Fe		Fe	
Mn		Mn		Mn	
Cu		Cu		Cu	
B		B		B	
Al		Al		Al	
Na		Na		Na	
Lime 2	Band	Lime 2	Band	Lime 2	Band
Gypsum		Gypsum		Gypsum	
Lime 0		Lime 0		Lime 0	

Cation Exchange Capacity (CEC)	% Base Saturation (Typical Ranges)					
	% Ca	% Mg	% K	% Na	% H
6.0						

Crop 1: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 19 K2O = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 61 lbs of 0-0-60 = 28 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 31 K2O = 19 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 45
SAMPLE ID 1
COUNTY CORSON
TWP 22-26
SECTION 32 QTR ACRES 0
PREV. CROP Grass/Alfalfa

	N	
W		E
	S	

SUBMITTED FOR:
WOLF CATTLE CO.

SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234817 BOX # 0
LAB # NW183228

Date Sampled | Date Received 12/27/2011 | Date Reported 12/29/2011

Nutrient In The Soil / Interpretation

Nutrient In The Soil		Interpretation (V.Low Low Med High)
Nitrate 0-6" / 6-24"	8 lb/ac / 6 lb/ac	
0-24"	14 lb/ac	
Phosphorus Olsen	2 ppm	
Potassium	214 ppm	
Chloride		
Sulfur 0-6" / 6-24"	6 lb/ac / 12 lb/ac	
Boron		
[illegible]	0.30 ppm	
Iron		
Manganese		
Copper		
Magnesium		
Calcium		
Sodium		
Org.Matter	2.7 %	
Carbonates		
Sol. Salts 0-6" / 6-24"	0.21 mmho/cm / 0.35 mmho/cm	

Crop Choices

	1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
Crop	Grass/Alfalfa		Wheat-Spring		Corn-Grain	
YIELD GOAL	2	Tons	40	Bushels	100	Bushels
SUGGESTED GUIDELINES	Band		Band		Band	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	16		94		106	
P_2O_5	25	Broadcast	31	Band *	51	Band *
K_2O	0		10	Band (Starter)*	10	Band (2x2) *
Cl						
S	12	Band	12	Band	12	Band
B						
Zn	2	Band	0		3	Band
Fe						
Mn						
Cu						
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
6.8							

Crop 1: * Caution! Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 20 K2O = 96 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: * Caution! Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: * Caution! Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 40 K2O = 27 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

Soil Analysis by Agvise Laboratories
Northwood: (701) 587-6010
Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID + 35 Field 46 35-21-25
SAMPLE ID 43
COUNTY CORSON
TWP 21-25
SECTION 26 QTR ACRES 0
PREV. CROP Sunflower

N / W / E / S

SUBMITTED FOR:
CORSON COUNTY FEEDERS

SUBMITTED BY: S00453
SD WHT GROWERS-MCLAUGHLIN
109 ELEVATOR ROAD
BOX 640
MCLAUGHLIN, SD 57642

REF # 11234742 BOX # 0
LAB # NW181634

Date Sampled | Date Received 12/14/2011 | Date Reported 12/29/2011

Nutrient In The Soil	Depth	Amount	Interpretation (V.Low / Low / Med / High)
Nitrate	0-6	9 lb/ac	
	6-24	9 lb/ac	
	0-24	18 lb/ac	
Phosphorus	Olsen	12 ppm	
Potassium		275 ppm	
Chloride	0-24	16 lb/ac	
Sulfur	0-6	8 lb/ac	
	6-24	12 lb/ac	
Boron			
Zinc			
Iron			
Manganese			
Copper		0.56 ppm	
Magnesium			
Calcium			
Sodium			
Org. Matter			
Carbonate (CCE)			
Soil Salts	0-6	0.23 mmho/cm	
	6-24	0.38 mmho/cm	

	1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
Crop	Wheat-Spring		Wheat-Spring		Wheat-Spring	
YIELD GOAL	30	Bushels	40	Bushels	50	Bushels
SUGGESTED GUIDELINES	Band		Band		Band	
	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
N	65		90		117	
P_2O_5	15	Band (Starter)*	18	Band *	23	Band *
K_2O	10	Band (Starter)*	10	Band (Starter)*	10	Band (Starter)*
Cl	24	Broadcast	24	Broadcast	24	Broadcast
S	7	Band (Trial)	7	Band (Trial)	7	Band (Trial)
B						
Zn						
Fe						
Mn						
Cu	1	Band (Trial)	1	Band (Trial)	1	Band (Trial)
Mg						
Lime	0		0		0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range) % Ca	% Mg	% K	% Na	% H
6.3							

Crop 1: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 19 K2O = 11 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 2: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 25 K2O = 15 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

Crop 3: 52 lbs of 0-0-60 = 24 lbs of Chloride" * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Crop Removal: P2O5 = 31 K2O = 19 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

AGVISE LABORATORIES

P.O. BOX 510, NORTHWOOD, ND 58267
(701) 587-6010

Mizera Brothers

SOIL TEST REPORT

FIELD 47A & 47B
COUNTY CORSON
TWP 21-27
QTR
PREV CROP SUNFLOWER
SAMPLE 1
SECTION 9
ACRES

N / W / E / S

REF # 13400649
LAB # 11338
BOX # 5047

SUBMITTED FOR:
WOLF CATTLE DEPOT

SUBMITTED BY: MZ1154
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57642

DATE SAMPLED
DATE RECEIVED 4/ 1/13
DATE REPORTED 4/ 2/13

NUTRIENT IN THE SOIL		INTERPRETATION (VERY LOW / LOW / MED. / HIGH)
Nitrate N 0-6"	18 lb/ac	
6-24"	12 lb/ac	
0-24"	30 lb/ac	*****
Olsen Phosphorus	10 ppm	**********
Potassium	334 ppm	**********
Chloride 0-24"	16 lb/ac	*******
Sulfur 0-6"	10 lb/ac	********
6-24"	18 lb/ac	******
Boron		
Zinc		
Iron		
Manganese		
Copper	0.54 ppm	**********
Magnesium		
Calcium		
Sodium		
Organic Matter		
Carbonate (CCE)		
Soluble Salts 0-6"	0.13 mmho/cm	****
6-24"	0.26 mmho/cm	******

52 LBS OF 0-0-60 = 24 LBS OF CHLORIDE

1ST CROP CHOICE: WHEAT		
YIELD GOAL 40 BU		
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	78	
P_2O_5	25	Band *
K_2O	10	Band(Starter)*
Cl	24	Broadcast
S	7	Band (Trial)
B	50#	10-50-0
Zn	10#	25-0-0-6S
Fe	160#	46-0-0
Mn	25#	21-0-0-24
Cu	1	Band
Mg		
Lime	0.0	

2ND CROP CHOICE: OATS		
YIELD GOAL 60 BU		
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	50	
P_2O_5	20	Band *
K_2O	10	Band(Starter)*
Cl	24	Broadcast
S	7	Band (Trial)
B	40#	10-50-0
Zn	10#	25-0-0-65
Fe	100#	46-0-0
Mn	15#	21-0-0-24
Cu	1	Band (Trial)
Mg		
Lime	0.0	

3RD CROP CHOICE: OATS		
YIELD GOAL 100 BU		
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	70	
P_2O_5	25	Band *
K_2O	10	Band(Starter)*
Cl	24	Broadcast
S	7	Band (Trial)
B	50#	10-50-0
Zn	10#	25-0-0-65
Fe	140#	46-0-0
Mn	21#	21-0-0-24
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
0-6" 6.2							
6-24"							

* CAUTION: SEED PLACED FERTILIZER CAN CAUSE INJURY *

Crop Removal: Crop 1: P_2O_5= 25 K_2O= 15 Crop 2: P_2O_5= 20 K_2O= 15 Crop 3: P_2O_5= 25 K_2O= 19

GVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

ADVISE LABORATORIES
P.O. BOX 510, NORTHWOOD, ND 58267
(701) 587-6010

SOIL TEST REPORT

FIELD Field 48 SAMPLE 2
COUNTY CORSON
TWP 21-27 SECTION 16
QTR ACRES
PREV CROP SUNFLOWER

N / W / E / S

SUBMITTED FOR:
WOLF CATTLE DEPOT

SUBMITTED BY: MZ1154
MZB-SDWG-MCLAUGHLIN
ZONES ONLY-BRENT
BOX 640
MCLAUGHLIN, SD 57642

REF # 1340B650
LAB # 11339 BOX # 5064

DATE SAMPLED DATE RECEIVED 4/ 1/13 DATE REPORTED 4/ 2/13

NUTRIENT IN THE SOIL		INTERPRETATION (V LOW / LOW / MED / HIGH)
Nitrate N 0- 6"	18 lb/ac	
6-24"	27 lb/ac	
0-24"	45 lb/ac	********
Phosphorus Olsen	6 ppm	**********
Potassium	358 ppm	**********
Chloride 0-24"	12 lb/ac	*****
Sulfur 0- 6"	10 lb/ac	*********
6-24"	24 lb/ac	********
Boron		
Zinc		
Iron		
Manganese		
Copper	0.54 ppm	**********
Magnesium		
Calcium		
Sodium		
Organic Matter		
Carbonate (CCE)		
Soluble Salts 0- 6"	0.25 mmho/cm	******
6-24"	0.30 mmho/cm	********

61 LBS OF 0-0-60 = 28 LBS OF CHLORIDE

1ST CROP CHOICE: WHEAT		
YIELD GOAL	40 BU	
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	63	
P_2O_5	26	Band #
K_2O	10	Band(Starter)#
Cl	28	Broadcast
S	7	Band (Trial)
B	50#	10-50-0
Zn	10#	25-0-0-65
Fe	125#	46-0-0
Mn	20#	21-0-0-24
Cu	1	Band
Mg		
Lime	0.0	

2ND CROP CHOICE: OATS		
YIELD GOAL	80 BU	
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	35	
P_2O_5	22	Band #
K_2O	10	Band(Starter)#
Cl	28	Broadcast
S	7	Band (Trial)
B	40#	10-50-0
Zn	10#	25-0-0-65
Fe	65#	46-0-0
Mn	10#	21-0-0-24
Cu	1	Band (Trial)
Mg		
Lime	0.0	

3RD CROP CHOICE: OATS		
YIELD GOAL	100 BU	
SUGGESTED GUIDELINES P & K MAINTENANCE		
LB/ACRE		APPLICATION
N	55	
P_2O_5	28	Band #
K_2O	10	Band(Starter)#
Cl	28	Broadcast
S	7	Band (Trial)
B	55#	10-50-0
Zn	10#	25-0-0-65
Fe	110#	46-0-0
Mn	16#	21-0-0-24
Cu	1	Band (Trial)
Mg		
Lime	0.0	

Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
			% Ca	% Mg	% K	% Na	% H
0- 6" 6.6							
6-24"							

CAUTION: SEED PLACED FERTILIZER CAN CAUSE INJURY

Crop Removal: Crop 1: P2O5= 25 K2O= 15 Crop 2: P2O5= 20 K2O= 15 Crop 3: P2O5= 25 K2O= 19

ADVISE Band/Maintenance guidelines will build P & K test levels to the medium range over many years and then maintain them.

Section K: Livestock Feed Management

COOPERATIVE EXTENSION SERVICE
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Animal & Range Sciences

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

Managing Feedlot Cattle to Reduce Nutrient Waste

by Julie Walker, area beef Extension specialist, and
Brad Johnson,[1] Extension ruminant nutrition and beef feedlot specialist,
SDSU Animal & Range Sciences Department

Management opportunities can reduce feed costs and the cost of excess nutrient waste outputs. The key to controlling excess nutrient output is controlling nutrient intakes. The question becomes whether nutrient excretion can be reduced without negatively impacting animal performance?

Balanced Rations

Nitrogen and phosphorus are the primary nutrients considered in nutrient waste management systems. Excess nutrient excretion can be controlled by properly balancing diets according to nutrient requirements for production.

The maintenance recommendations for phosphorus (NRC 1996) have been reduced by approximately 43% from 1984 NRC recommendations. The new recommendation is 0.22% P to meet nutrient needs for maintenance and gain of an 800 lb steer on a finishing diet. Erickson et al. (1998) conducted an experiment to evaluate animal performance across various levels (0.14 -0.34%) of P intake. Steer performance was measured as average daily gain (ADG), dry matter intake (DMI), and feed efficiency. These variables were not affected by P level in the diet. This suggests that when steer diets are balanced, producers can lower the P levels in the diet to the 1996 NRC recommendations without negatively affecting performance.

Most corn-based diets average 0.28 - 0.32 % P, exceeding the requirement for an 800 lb steer. The challenge then becomes lowering the phosphorus concentration of a corn-based diet.

Typically feedstuffs other than corn are needed to lower the phosphorus concentration of the diet. Comparing phosphorous book values of whole grains (barley, oats, sorghum, and wheat), corn has the lowest phosphorus level. Therefore, the best possible management alternative is to minimize additional supplementation of phosphorus.

Forages are typically lower in phosphorus than concentrates. However, lowering the ration P concentration by increasing levels of forage has the disadvantage of decreasing gains.

Protein (nitrogen) requirements can be divided into two segments, protein needed by the microbial population in the rumen and protein needed by the animal. Degradable intake protein (DIP) is the protein used to meet the microbial requirement and the animal requirement can be met by microbial protein leaving the rumen and by undegradable intake protein (UIP). Excess DIP is converted to ammonia and excreted in the urine.

Protein requirements change as the animal grows. There is an opportunity to reduce crude protein level of the diet. When a ration is balanced using DIP and UIP, usually the crude protein of the ration is lower than when balanced with crude protein levels.

1 Department of Animal Science and Industry, 126 Call Hall, Kansas State University, Manhattan, KS 66506

Feedstuffs vary in the amount of protein degraded in the rumen (DIP) versus small intestine (UIP). For example, dry-rolled corn is 40% DIP and high-moisture corn is 60% DIP with the same amount of crude protein (8-10%).

Protein sources also vary in DIP percentages, such as soybean meal 65%, cottonseed meal 57%, feathermeal 30% and fishmeal 40%. By using a variety of feedstuffs, UIP, and DIP requirements can be met at lower crude protein levels in the diet, thus reducing nitrogen excretion.

Phase Feeding

Phase feeding is a systematic method for adjusting the animal's diet during the feeding period to meet its nutrient requirements. Since nutrient requirements change as cattle grow, protein and phosphorus requirements can be reduced as an animal matures. This suggests the opportunity to reduce nitrogen and phosphorus intakes and excretion.

An experiment was conducted by the University of Nebraska to evaluate phase feeding with yearlings and calves. The concentrate portion of the diets was comprised of dry rolled corn, high moisture corn, or corn bran. Control (CON) steers consumed a diet of 13.6% CP, 4.48% UIP, and .34% P compared to a balanced (BAL) yearling diet that was systematically reduced during the feeding period from 11.9 -11.2 % CP, 3.67% UIP, and .24-.22 % P. Yearlings fed the balanced diet consumed less dry matter than the control steers (Table 1). However, no differences in ADG, feed efficiency, or carcass characteristics (data not shown) were found.

The second experiment involved calves. The control diet was 13.4% CP, 5.16% UIP, .35% P compared to the balanced diet (12.7-10.8% CP, 5.51-3.02% UIP, and .26-.20% P), which was phase-fed in 8 finishing diets. Calves fed the balanced diet had similar DMI, ADG, and feed efficiency as control calves (Table 1).

Table 1. Feedlot performance for yearlings and calves fed control or balanced rations.

	YEARLING		CALVES	
ITEM	CON	BAL	CON	BAL
Initial Wt, lb	652	660	539	542
Final Wt, lb	1249	1249	1245	1247
DMI, lb	26.2	25.0*	20.6	20.5
ADG, lb	4.06	4.01	3.66	3.65
F/G	6.45	6.21	5.72	5.64

Erickson et al., 1998
* P < .05

Phase feeding yearling steers reduced N and P excretion by 16 and 44% respectively (Table 2). This indicates improved nutrient output (i.e. lower N and P excretion) can be achieved without compromising animal performance.

Table 2. Nitrogen and Phosphorus Balance for yearlings.

	NITROGEN		PHOSPHORUS	
	CON	BAL	CON	BAL
	Lbs/hd/d		Lbs/hd	
Intake	.56	.47*	12.52	7.90*
Retention	.06	.06	2.05	2.03
Excreted	.50	42*	10.47	5.87*

Erickson et al., 1998
* P < .01

Phase feeding allows nutritionists to more effectively optimize performance without overfeeding. This improvement was demonstrated by reducing intake thus reducing potential feed costs. Additional cost savings could be realized by reducing the amount of nutrients excreted in animal waste.

A practical disadvantage of phase feeding is constantly changing diets. Phase feeding increases management requirements to ensure proper delivery of the correct diet. The risk of metabolic disorders that could occur with improper diet changes is increased in these systems.

Implants

Anabolic growth-promoting agents, commonly referred to as implants, are approved for use in steers and heifers targeted for harvesting. Characteristics of implanted cattle are enhanced growth rate, feed efficiency, and lean tissue accretion. Implanting steers on finishing diets has improved gains by 8-20% and feed efficiency by 5-15%. With implanted heifers, gains were increased 10-20% and feed conversion improved by 7-12%.

The increased tissue accretion suggests the possibility of reduced nutrient excretions. An example from Johnson et al. (1996) showed that the animals implanted with trenbolone acetate (TBA) + estradiol (E2) increased ADG by 18% (Table 3) during the 40 day period, suggesting that nitrogen and phosphorus retention would be higher in the implanted animals. Table 4 shows that the amount of nitrogen retained in the carcass was increased by 82% during the first 40 days for implanted animals. Similar intakes were observed in this study; therefore, the amount of nitrogen excreted would be less from implanted animals compared to control animals. Table 5 illustrates calculated estimates for reducing phosphorus excretion by implanting during the first 40 days. Phosphorus is needed for both maintenance

(Pm) and gain (Pg). Since the maintenance requirement is calculated from body weight, implanted animals have a slightly higher requirement. Phosphorus for gain is calculated as 3.9 g per 100 g of protein gain or 5.54 g P/d and 10.10 g P/d for control and implanted animals, respectively.

Since true absorption of phosphorus is 68%, 18.3 g P/d and 25.1 g P/d were needed by the control and implanted steers to meet their phosphorus requirements for maintenance and gain. The phosphorus balance calculations indicate potential for reduced phosphorus excretion.

Table 3. Feedlot Performance for initial 40 days of finishing period

ITEM	CONTROL	IMPLANTED
Initial Wt, lb	869	869
Days 0-40		
ADG, lb	3.89	4.58*
F/G	5.47	4.83*
DMI, lb	21.3	22.2
P Intake, g/d	26.14	27.19

Johnson et al., 1996
* P < .05

Table 4. Effect of TBA + E2 on Carcass Nitrogen

ITEM	CTL	IMP	CTL	IMP	%Response
	N Intake, g/d		Carcass N gain, g/d		
Days 0-40	186	193	18.2	33.1	82**
Days 0-115			18.9	25.3	34*
Days 0-143			18.2	22.7	25*
Days 41-115	192	210	19.5	20.3	4
Days 116-143	179	201	11.5	18.2	58

Johnson et al., 1996
** P < .01
* P < .10

Table 5. Phosphorus Balance for first 40 days

ITEM	CONTROL	IMPLANTED
P Intake, g/d	26.14	27.19
Pm, g/d	6.89	6.99
Whole Body Protein Gain, g/d	142	259
Pg, g/d	5.54	10.10
P Excreted, g/d	20.6	17.09
Estimated requirement, g/d	18.3	25.1
P Excess, g/d	7.8	2.09

Calculated from Johnson et al. 1996 data.

Summary

Ration balancing allows producers to manage the nutrient intake for optimum performance and minimizing nutrient output. Adjusting rations throughout the feeding period reduces potential of overfeeding of nutrient such as nitrogen and phosphorus. Use of implant and other growth enhancers permits for improvements nutrient retention, thus reducing nutrient output.

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Section L: Odor and Insect Pest Control

RECOMMENDED STRATEGIES FOR ODOR CONTROL IN CONFINEMENT BEEF CATTLE OPERATIONS

Kent Tjardes[1], Alvaro Garcia[2], Hans Stein[1], Charles Ullery[3], Stephen Pohl[3], and Christopher Schmit[4]

[1]Animal and Range Sciences Department, [2]Dairy Science Department, [3]Agriculture and Biosystems Engineering Department, and [4]Civil and Environmental Engineering Department, South Dakota State University, Brookings, S.D.

Odors coming off a beef feeding operation are generated from three different sources: the feedlot facility, waste storage, and the land where the manure is applied. In some operations, the feedlot facility may also serve as the primary waste storage area. To reduce the total amount of odor generated from a beef feeding operation, odor generation and emission by each of these three sources needs to be reduced.

Several options for odor reduction are available in each area. Only practices that are proven to be effective and that can be immediately implemented in new and existing facilities are listed in Table 1. Other options are currently being developed or tested; continued research will reveal whether they can be successfully implemented in the future.

The table is organized in four sections covering practices to reduce odor generation, reduce odor emission from facilities and storage units, increase odor dispersion, and reduce odor emission from manure application. For each practice, advantages and disadvantages are listed. The effectiveness and the cost of implementing each practice are indicated using odor generation from a standard beef feeding operation as a base line. The base line operation is assumed to be dirt-lot with no slope, no additional manure storage structure, and no dietary modifications to reduce odor generation.

The effectiveness of each practice is indicated as "low," "moderate," or "high." A low effectiveness is assumed to reduce odor generation by less than 20%; moderate, 20 to 50%; and high, more than 50% relative to the base line operation. These values relate only to the specific area in which the practices are used.

Some practices in the table are listed as best management practices (BMP). These are practices with a well-documented beneficial effect on the sustainability of a production system. Their implementation should be encouraged even without considering their potential for reduction of odor emission.

The cost of each practice is indicated. A "low" cost is assumed to be less than $0.50 per head marketed (steer or heifer), "moderate" adds $0.50-$1.50 per head, and "high" adds more than $1.50 per head to total production costs as compared to the base line unit.

Final Recommendations

The most common beef cattle feeding facilities in South Dakota are dirt lots. Simply modifying management practices, such as balancing diets properly, keeping the lots dry by providing adequate slope and manure removal, and incorporating manure as quickly as possible following application, can reduce odors emissions from these types of facilities. Other practices listed also should be considered for greater levels of odor control.

For cattle confined in a building, a biofilter may be considered. This is an inexpensive, environmentally friendly system producers can construct. It is made from a compost-woodchip mixture that, when moistened, captures and contains many common odors. It is attached to an exhaust fan, and when air is directed through the compost mixture, it traps up to 96% odor-free air.

Research in the area of odor reduction is ongoing and many new technologies are being developed. As independent research using these technologies become available, some of them may prove to be even more effective than the once listed above.

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Table 1. Odor reduction practices for beef feedlots

Practice	Description	Advantages	Disadvantages	Effectiveness	Cost	Comments
			Generation			
a. Diet manipulation	Feeding closer to protein requirements (phase feeding).	Decreased N excretion with diets balanced for requirements.	None	Low to moderate	Low	Returns in production offset costs. Should be considered a BMP.
	Balance diets for protein degradability rather than total crude protein.	Overfeeding crude protein (CP) avoided. Efficient nutrient use.	Possibly more labor	Low to moderate	Low	Returns in production offset costs. Should be considered a BMP.
	Avoid overfeeding sulfur	Sulfur excretion prevented, reduced production of hydrogen sulfide and other aromatic compounds	If requirements are underfed, microbial protein may be depressed	Low	Low	
b. Feed preservation	Avoid ensiling forages with excess moisture. Adjust feed-out face to minimize aerobic exposure.	Reduced spoilage. Increased efficiency of feed utilization.	Dependent on weather and timely availability of harvesting equipment	Low	Low	Improved efficiency of nutrient utilization offsets costs. Should be considered a BMP.

Table 1. Odor reduction practices for beef feedlots (cont.)

Practice	Description	Advantages	Disadvantages	Effectiveness	Cost	Comments
			Emission			
a. Animal housing 1. Earthen lots (with or without sheds)	a. Adequate slope b. Oil treatment	Keeps lots dry to reduce microbial activity Prevents dust and may prevent respiratory irritations in cattle	Need collection for runoff Increased cost of product and application	Moderate Low	Low Low to moderate	Waste management issues may need to be addressed Some of the cost may be offset by improved performance
2. Concrete lots with sheds	a. Scrape manure often b. Bedding	Reduces volatilization May reduce volatilization of nitrogen and sulfur	Increases labor Increased cost of bedding, manure handling and labor	Moderate Low to moderate	Low Low	Should be considered a BMP
3. Solid floor building	a. Deep pack	May reduce volatilization of nitrogen and sulfur	Increased cost of bedding, manure handling and labor	Low to moderate	Moderate	More research with these building types need to be conducted
4. Slatted floor building	a. Biofilters. Air is exhausted through a biofilter. Materials: Mixtures with 30% to 50% of compost (by weight) and 70% to 50% of wood chips	Very effective	Cost and building design may prevent use	Moderate	Moderate	Lameness and reduced performance may be a problem with long days on feed
b. Manure storage 1. Earthen basins (single or double cell)	Covers: Natural crust Bio-covers (straw) Inorganic (geo-textile, clay balls, plastic cover)	High nutrient retention	Difficult to cover evenly. Care must be taken during agitation and pumping (particularly with inorganic covers). With plastic covers air can exhaust through a bio-filter	Natural crust: High Bio-covers: High Inorganic covers: High	Low Low Moderate to high	Odor potential if slurry is not injected. Local ordinances may limit design options. Effectiveness highly dependent on proper management
2. Steel or concrete tanks above or below ground:	Covers: a. Impermeable (PVC, wood, concrete) b. Permeable (straw)	Duration (10-15 years) Cost	Cost Duration. Sometimes difficult to maintain afloat	a. Impermeable: High b. Permeable: High	Moderate to high Moderate	Impermeable cover: A bio-filter needs to be added at the end of the vents to treat exhaust gases
3. Solids separation	Solids separated from liquids through sedimentation basins or mechanical separators	May reduce odor/ammonia. Easier agitation and pumping.	Capital/operational costs; reliability	Moderate	Moderate	Adds another "waste" source to be managed by the producer
4. Aeration	Air is forced into the manure storage system. Aerobic bacteria oxidize odorous compounds to carbon dioxide and water	Reduces methane, hydrogen sulfide, ammonia and volatile fatty acids.	Added utility costs. Requires power to aerate the materials	Moderate	Moderate	
5. Methane digesters	Treats waste with 3-10% solids. Biogas methane produced to maintain digester temperature	Generation of electricity.	Currently suitable for dairies with 1,000 animal units or more. Likely requires slatted floor building	High	High	Limited data

Table 1. Odor reduction practices for beef feedlots (cont.)

Practice	Description	Advantages	Disadvantages	Effectiveness	Cost	Comments
Siting/Dispersion						
a. Shelterbelts	Creates barrier of vegetation for dust and odor compounds.	Help disperse and dilute odors. Cost. Environment. Aesthetics	Planning and time required for effective barrier to grow	Low	Low	The most cost effective odor dispersion method.
b. Windbreak walls	Solid or porous wall 10 to 15 feet from the exhaust fans causes dust to settle.	Rapid implementation. Help disperse and dilute odors. Trap dust particles	Cost. Aesthetics. Need for periodic cleaning of dust from porous walls	Low	Low to moderate.	Recent and on-going research but needs more
c. Setback distances	Optimize distance between odor emission sources and urban areas	Complaints less likely	Not applicable for dairies currently in operation	High	Variable.	Recent and on-going research but needs more
Land Application						
a. Manure incorporation	Manure is rapidly incorporated in the soil after spreading with plowing	Reduces odor and ammonia emissions	Requires some degree of management by the producer	Moderate	Moderate	Most research has been done in Europe. More research on odor emission needed
b. Manure injection	Manure is injected into the soil (shallow and deep)	Reduces odor and ammonia emissions	Cost	High	Low	Most research has been done in Europe. More research on odor emission needed
c. Band spreading	Manure is discharged at ground level through a series of trailing pipes	Reduces odor and ammonia emissions	Manure must be rapidly incorporated	Low	Low	Most research has been done in Europe. More research on odor emission needed

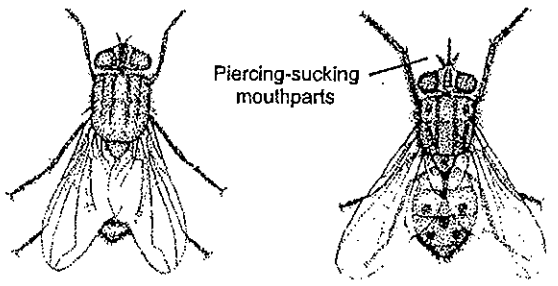
A2118

Identifying and Controlling Flies

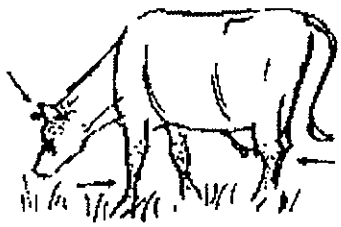
On dairy, beef, other livestock and pets

W.L. Gojmerac

Among the more common flies associated with livestock are the house, face, stable, horn, deer and horsefly. Before starting control procedures, it is important to accurately identify them since their behavior, life cycle, and sites where larvae develop are different. For example, horn and face fly larvae develop only in fresh cow manure in the pasture, deer and horsefly larvae in swamps, and house and stable fly larvae in decaying organic matter. The following descriptions will enable you to identify the type of fly which is causing problems.



House Fly Stable Fly



Identification

House Fly

Description: The house fly is well known because it is generally near human and animal habitations. The fly is gray in color with four dark stripes down its back and the face is slightly straw colored. It feeds with a swabbing type mouth rather than a blood-sucking type. The house fly is about 1/4 inch long. While most important as a disease carrier, house flies also disturb cattle. They are most active on hot, sunny days.

Life History: Adult flies become active in April and May and lay eggs in batches of 100–150 in manure and garbage. Up to four layings have been noted. Eggs hatch in about 24 hours. Maggots have fully grown in about 7–10 days and then pupate. At the end of the pupation period, flies emerge and in several days lay eggs. In hot weather, populations increase rapidly because the life cycle requires only 10–14 days; but during cooler periods, the life cycle may be as long as 2–3 months. Normally the maggots or pupae overwinter, but often adults survive in heated buildings or barns.

Stable Fly

Description: The stable fly is similar in appearance and size to the house fly except that it has well-developed black, piercing-sucking mouth parts. The back and abdomen have several large spots on them. When not on cattle, the stable fly likes to rest in the shade on wooden posts, trees, and buildings. The stable fly prefers to attack active animals rather than those at rest. Ears and legs of cattle are the parts most often fed upon, and without control, numbers of flies are particularly noticeable on the legs of cattle. The stable fly generally feeds upwards, and attacks cattle only during the day.

Life History: Stable flies lay their eggs in manure and decaying vegetation. Egg laying is started only after the female has consumed three blood meals which may be as soon as 9 days after the fly emerges. The cycle from egg to adult takes about a month and there may be several generations per year. Maggots and pupae overwinter in strawy manure.

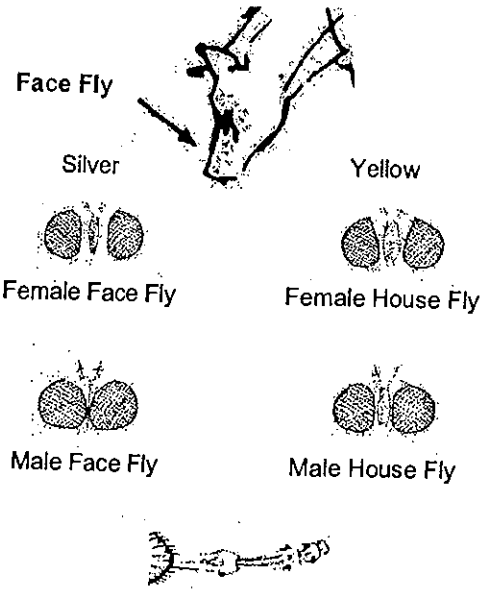
Face Fly

Description: In size and appearance the face fly is nearly identical to the house fly and it takes an expert to distinguish between them; however, the face fly can usually be identified by its location on the cow. Face flies congregate in large numbers around the heads of cattle, particularly those moist areas caused by tears and saliva. This is very annoying to a cow and can cause reductions in weight gains or milk production. Pink eye and blindness in cattle are believed to be spread by this fly as it swabs up mucus and moisture about the eyes. In summer the face fly often rests in the sunlight on wooden posts and feed bunkers where cattle are kept.

There is a positive method for distinguishing between face flies and house flies, but it is necessary to catch the fly. The female face fly has a silvery face; the female house fly has a yellowish face. Females can be distinguished by squeezing their abdomen. This causes the ovipositor or egg laying structure to extend from the tip of the abdomen. No similar structure is present in males. The eyes of male face flies almost meet in the center of the head but the eyes of the male house fly are well separated. With a little practice, it becomes unnecessary to capture the fly to make such distinctions.

Life History: The life cycle of the face fly is nearly identical with that of the house fly, except that a face fly can lay as many as 1500 eggs in its life span. Eggs are laid and

larvae develop in fresh cow manure in pastures. The fly often overwinters in houses and when numerous become a household pest on warm winter and spring days.



Horn Fly

Description: The horn fly is about half the size of a house fly (slightly more than 1/8 inch), dark gray in color, and has piercing-sucking mouth parts. The horn fly remains on cattle day and night, leaving only to lay eggs in freshly dropped cow manure. Horn flies feed primarily on withers, around the horns, and along the back. They generally feed facing downwards. During hot weather or rains, the flies may move to the belly and on cool nights may cluster around the udder. The adults live about 3 weeks and feed exclusively on cattle blood. The annoyance caused by horn flies causes milk production and weight gains to be reduced.

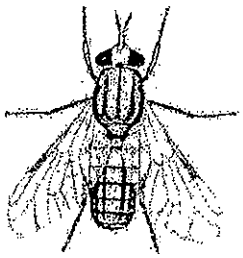
Life History: Horn flies lay their eggs in fresh cow manure where the maggots can feed. The eggs hatch in about 20 hours and maggots develop for about 5 days before pupating. At the end of a 5-day pupation period, the flies emerge and within 3 hours begin feeding on a cow. By the third day the females can begin laying eggs. Only about 20 eggs are produced per batch, but a female may lay up to 400 eggs in her lifetime. Maggots and pupae overwinter in manure.

Horn Fly

Deer Fly

Description: Deer flies are a little larger than house flies and the body is yellow with brown stripes. The wings have conspicuous brown bands and the mouth parts are the piercing-sucking type. Deer flies are heavy feeders, and wounds they make by feeding may bleed after an attack. They are daytime feeders and most active on hot days.

Life History: Eggs are usually attached to vegetation above water or moist ground. Upon hatching, the larvae drop into the soil and spend one to several winters here, before maturing in pupae and finally emerging as adults.



Deer Fly

Horse Fly

Horse Fly

Description: Horse flies are the largest and most easily recognized cattle pests in Wisconsin. There are several species of horse flies in Wisconsin; however, all can be recognized as horse flies by their large size, their large rounded eyes, and the loud buzzing they make while in flight. The females have large, piercing-sucking mouth parts which inflict painful wounds. The males are harmless flower feeders. Biting is usually confined to the back with only a few flies on a cow at one time. They attack cattle only during the day and are most active on hot days.

Life History: See deer fly.

Control

Livestock Operations

Good sanitation is required if house and stable fly population are to be kept at a minimum. Weekly cleanout of calf pens, hutches and box stalls is a must. Don't forget the accumulated feed, especially under drinking cups.

Flies can and will breed in manure that accumulates in exercise yards around feed bunks, fence lines and any place not trampled by cattle. If cattle are kept in the exercise yard during the summer, you will have more fly problems than if cattle are pastured away from farm buildings—manure handling and feed storage facilities will require special attention.

Health and milk quality control officials specify how often gutters should be cleaned. But remember, flies also breed in decaying feed, in manure that accumulates around sprockets of the barn cleaner and in recesses, corners and crevices where manure has accumulated longer than one week.

Dairy Cattle

The selection of fly sprays for use on dairy cattle is important. Using the wrong product could not only injure the animal, but might contaminate its milk with an illegal residue. Products approved for use on dairy cattle by state and federal authorities are safe and will not contaminate milk when used properly. Be sure the label states this approval and follow directions exactly.

Several coumaphos (CO-RAL), dichlorvos (Vapona), permethrin (Ectiban, Atroban), pyrethrins and tetrachlorvinphos (Rabon) products are available and registered for use on dairy cattle. They can be purchased as a ready-to-use mixture or as a concentrate to be mixed with water. Naled (Dibrom) can be used in the dairy barn but not in the milk room or milk house. Coumaphos (CO-RAL), malathion, methoxychlor, permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) dusts are also registered.

Although dusts are available and registered for use on dairy cattle, some milk-marketing organizations object to their use. Check with your local fieldmen before using them. Dusts applied directly to cattle have been effective only on horn flies.

Cattle can be self-treated as they enter or leave the barn, hand sprayed, or the barn can be mist- or fog-treated while the cattle are inside. Do not individually treat cattle and mist/fog barn at the same time. Follow directions on the container exactly. Observe all safety precautions. If face flies are a problem, give special attention to spraying head and shoulders.

Back rubbers are an effective way to treat cattle not regularly coming into the barn. Use only those products approved for backrubber use on dairy cattle, such as permethrin or coumaphos (CO-RAL). Follow mixing directions on the label.

DO NOT MAKE YOUR OWN COMBINATION PRODUCTS BY MIXING INSECTICIDES.

Milkhouse and Egg Handling Room

Hand spray or fog with dichlorvos (Vapona) or pyrethrins when necessary. Use the same dosage listed for dairy cattle. Do not contaminate food handling utensils. The dichlorvos (Vapona) strip can be used. But do not use it in kitchens or in food handling and processing establishments where there is exposed food. Sticky fly strips or papers can also be used where appropriate.

Electronic ultrasonic repellers are supposed to "drive away" pests and not harm the good animals. These devices simply don't work.

Electrocutors and light traps will kill insects when employed properly. Some are designed to intercept night-flying insects entering a food plant that are attracted to light. Others are designed to monitor insect populations. This is far different than trying to control insects, such as flies, which are not hightly attracted to light. There is no question that some flies will be electrocuted when they contact the exposed wires, but the number killed is a very low percentage of flies in the area. So for practical purposes, electrocutors and light traps are of no value.

Buying and releasing beneficial, parasitic or predator insects is an excellent way to control pests, but this technique works only in a very limited number of situations, and managing this process is a highly complex operation. The U.S.D.A. studied fly populations on feedlots and dairies. Researchers reported no differences in adult populations of flies on those farms releasing parasites when compared to the other farms.

Livestock Barns

Diazinon (WP), dimethoate, fenthion (Baytex), malathion, naled (Dibrom) permethrin (Ectiban, Atroban) and tetrachlorvinphos (Rabon) can be used in livestock housing.

As a routine precaution, remove all livestock from the building being sprayed. Spray the walls and ceilings with insecticide. Repeat when flies no longer drop from the surface because insecticide has lost its toxicity. Insecticides are generally non-toxic or useless if applied to a concrete or brick surface—improved performance is obtained by painting or whitewashing before spraying. Some insecticides can be mixed and applied with whitewash. Do not spray exposed Styrofoam insulation with the insecticide mixture.

Feed Additives to Control Flies

Several products are approved for use as a feed or mineral additive or in a bolus to control flies. They are diflubenzuron, phenothiazine, methroprene (Altosid) and tetrachlorvinphos (Rabon). These chemicals pass through the digestive tract without harm to the animal and leave no illegal residues in the meat and/or milk when mixed and fed according to manufacturer's directions. Enough insecticide remains in the manure to kill or prevent flies from completing their development.

Tetrachlorvinphos (Rabon) is registered for use in dairy as well as beef animals, while phenothiazene is approved only for beef animals.

The insecticide must be mixed with either the feed concentrate or mineral mixture. The animal must consume a specific amount of feed-insecticide or mineral-insecticide mixture daily. For example, tetrachlorvinphos is registered to be fed at 70 milligrams per 100 lbs. of body weight per day. You need to know the weight of the animal being fed and the amount of feed consumed each day by this animal. Based on this information your feed dealer and/or chemical supplier can determine the quantity of stirofos to be mixed into your feed.

Bolus

To control developing flies (maggots) in manure, uniform quantities of insecticide must be present at all times. A bolus containing diflubenzuron (Vigilante), when placed in the animal's stomach, will constantly release insecticide all season, at concentrations adequate to kill developing flies. The bolus can be administered with a standard balling gun. Small animals require 1/2 bolus; medium animals, 1 bolus; and large animals, 1 1/2 boluses. This product is approved for beef as well as dairy animals.

Ear Tags

Insecticide-impregnated ear tags have been approved for use on dairy and beef animals. Be sure tags are attached correctly. They are very effective in controlling horn flies, only moderately effective in reducing numbers of face flies, and are much less effective against house and stable flies.

Beef Cattle

Primary pests on beef cattle are horn, face, deer and horse flies; and mosquitoes. Currently there is no practical control for deer and horse flies or mosquitoes. Face flies are also difficult to control. However, the horn fly is easy to control, and the farmer has a choice of insecticides. Use the proper dosage; follow all safety precautions; and if cattle are to be sold for slaughter, observe the proper withdrawal periods. These products can be applied by spray, backrubber or self-treating dust bags.

Other Animals

While flies generally do not bother hogs, chickens, and rabbits, and horses and dogs are not involved in human food production, fly control is still important. Flies are considered a public health nuisance and health authorities can force you to take action.

If you are involved with these animals, recognize your responsibilities. Decaying organic matter such as manure, unconsumed food, spilled food, or wet bedding can help produce large quantities of flies. Do not rely on insecticides. **Sanitation can replace insecticides, but insecticides will not replace sanitation.** Generally the most practical solution is a compromise.

When using insecticides near and around animals:

a. Read and follow label directions exactly.

b. Do not apply any insecticide directly on an animal unless the label specifically states the animal can be safely treated.

c. When using any insecticide near the animals, be aware of the animals' normal or natural behavior. Horses can be frightened by a spray; cats, by their normal grooming, might ingest chemicals applied to their fur; and birds might pick up fly or roach bait, or they may try to alight on a suspended dichlorvos (Vapona) strip.

Recent Changes

Under current federal regulations, insecticides are not permanently registered. The Environmental Protection Agency reviews the current research data base, and if it is incomplete, the EPA can require the manufacturer to provide additional data to support the registration claims. If there is evidence that the insecticide causes an unreasonable adverse effect on the applicator, animal, food product or environment, the EPA can require modified directions on the label.

The manufacturer has several options: 1) provide the required data to support registration; 2) withdraw certain uses; or 3) withdraw the registration and stop making and selling the product.

Unless there are questions of safety and/or serious illegal residues, existing supplies of the product may be used.

Several popular insecticides are now being phased out or having uses withdrawn because the manufacturers believe the cost of supplying the data won't be recovered from product sales. You may find that your favorite product is no longer available, or that you may no longer use it to control a specific pest.

Therefore, it's important to 1) buy only reasonable quantities of any insecticide at one time, and 2) deal with responsible suppliers handling only currently registered products.

Resistance

In some parts of the United States, flies have developed a high degree of resistance to the pyrethroid insecticides such as cyfluthrin, cypermethrin, cyhalothrin, fenvalerate and permethrin. If you have fly-control failures with pyrethroid insecticides, consider using phosphate products (a different class) such as coumaphos, diazinon, dichlorvos or tetrachlorvinphos.

Buying an Insecticide

Consult a knowledgeable person when buying insecticides—mistakes can be costly. When in doubt, contact the State Department of Agriculture, Trade and Consumer Protection. It is responsible for administering and enforcing Wisconsin insecticide laws.

See publication A1991, Controlling Mosquitoes for recommendations for mosquito control; and publication A1235, Spider Control in Homes and Barns, for spider control.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture andWisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities in employment and programming including Title IX requirements.

W.L. Gojmerac is professor of entomology, College of Agricultural and Life Sciences, University of Wisconsin–Madison and University of Wisconsin–Extension, Cooperative Extension. *We extend appreciation to O.L. Lovett and Wisconsin State Department of Agriculture, Trade and Consumer Protection for the illustrations and descriptions of flies.*

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A2118 Identifying and Controlling Flies: On dairy, beef, other livestock and pets **R-08-91-1M-45-E**

Section M: Operation & Maintenance, Holding Pond Pumping and Emergency Plan

M.OPERATION & MAINTENANCE GUIDELINE

The owner acknowledges responsibility for the proper operation and maintenance of the animal waste management system. Although the design is based on the best available technical knowledge, it must be recognized that any system creates some risks, and therefore needs to be properly operated and maintained, including periodic inspection. In addition, maximum efficiency cannot be obtained unless the system is properly operated and maintained so that it will function safely in its intended manner.

Recognizing this, this Manual has been prepared as a general guideline for operating and maintaining the system. This Manual is not inclusive of all of the provisions of the General Water Pollution Control Permit for Concentrated Animal Feeding Operations, therefore the owner should review the permit in its entirety.

It is recommended that the following list be reviewed and be used as a checklist to ensure major elements of operation and maintenance are consistently being observed.

I. General Considerations

A. Any discharge from the waste management system or land application sites must be reported as soon as possible, but no later than twenty-four hours after the discharge was discovered. The discharge must be reported to the EPA at (303) 293-1788.

B. All inspections should be documented on the forms included with this manual or other suitable forms. Documentation must be maintained on site and be made available to the EPA when requested.

C. Travel of vehicles and livestock should be confined to designated areas to prevent erosion and enhance vegetation.

D. Maintain grades around containment structures to assure positive surface drainage away from the structures in all directions. Fill any settled areas which may collect water.

E. Any discovered damage to any facility component must be repaired as soon as possible to original specifications.

F. Do not allow trees to grow adjacent to holding ponds, to avoid root damage to the structures.

G. Manage vegetation growth on and near facility components so that adequate component inspection is possible.

H. Control vegetation growth on the holding pond interior below the maximum operating elevation to prevent liner damage from roots.

I. Maintain the overall system (i.e. pens, building covers, diversion channels, stacking pads settling basins and risers) to ensure that all contaminated runoff enters the containment structures.

J. The entire feed storage area must be managed to minimize both seepage from any high moisture feed and runoff from the area. Silage piles shall be covered as soon as possible after the feed is harvested and uncovered as the silage is fed.

II. Waste Application Considerations

A. Routinely monitor the level of the pond to assure there's enough storage remaining (plus freeboard) to hold the designed volume of a 25 year 24 hour storm event. This maximum operating level is marked on the staff gage in Holding Pond 4. Land application must be planned and carried out to prevent holding pond levels from rising above the maximum operating elevation. In the event that this level is exceeded, the producer has 14 days of possible land application days to restore the pond to a level at or below the maximum operating elevation.

B. Plan ahead and use the "Plan for Pumping feedlot Runoff Holding Ponds" following this section for additional information.

C. Whenever possible, apply downwind from any residences. Avoid applying on calm, humid days, since these conditions restrict the dispersion and dilution of odors. Application on weekends or holidays, when people in the area are more likely to be outdoors, should also be avoided.

D. Do not apply waste on snow or frozen ground unless unavoidable. Consult the General Permit for conditions that must be followed in these circumstances

E. Do not apply waste material immediately after rain or within twelve hours of forecasted rain unless it can be immediately incorporated into the soil.

III. Inspection and Documentation

A. Items to be Performed Daily

1. Year Round

a. Record any measurable precipitation.

b. Record the date that livestock are brought in to and removed from the facility.

2. During Periods of Land Application
    a. Record the days each field is applied to, as well as weather conditions including; temperature and wind speed and direction.
    b. Inspect and record the condition of the land application fields being used.
    c. Inspect and record the condition of all land application equipment being used.
    d. Inspect and record the condition of the holding pond liner and embankment near the pump intake if pumping is taking place.

B. Items to be Performed Weekly

The entire Waste Management System must be inspected weekly. This includes but is not limited to the following.

1. Record the depth of water in all evaporative ponds.
2. Inspect risers and pipe to ensure they are not plugged or damaged. Clean any significant sediment build up as soon as possible.
3. Inspect evaporative ponds for signs of leaking or seepage, excessive settling, excessive vegetation growth or damage due to vehicles or equipment, rodents or erosion. Report any leakage as detailed above and make plans to rectify any problems as soon as possible.
4. Inspect fences and safety signs around facility, if applicable, to ensure they are present and in good condition. If necessary repair immediately.
5. Record any livestock mortalities and how the carcasses were properly disposed of.(i.e. rendering service receipt, location of burial, etc.)

C. Items to be Performed Annually

1. Conduct soil and manure nutrient testing as required by the Nutrient Management Plan.
2. Prepare an annual Planned Manure Recommendations based on current data.
3. Prepare and submit an annual report to the EPA.

IV. Items pertaining to the control of odors, flies and other nuisances

A. As much as is reasonable, standing water and wet pen conditions shall be prevented or eliminated by routine pen maintenance.

B. Mortalities shall be promptly disposed of in an appropriate manner (incineration, burial, etc.).

C. Feed storage and bunk areas will be managed to as much as possible prevent

spoilage of feed. When spoilage does occur, it shall be promptly cleaned up and disposed of properly (i.e. field applied, dried and stockpiled, buried, etc.).

D. If insects become problematic, a pesticide program will be undertaken for control.

V. Record Keeping

A. The following items should be kept on site at all times.

1. Copy of the approved EPA Permit Application.
2. Copy of current nutrient management plan.

B. The following items should be kept on site for a period of 5 years from the date they are created.

1. Inspection reports from all inspections listed above.
2. Soil and manure nutrient test results.
3. Calculations of allowable manure application rates and actual rates applied.
4. Documentation of any action taken to correct deficiencies.
5. Documentation of any discharge, steps taken to minimize it and the estimated volume discharged.

I have reviewed the above Operation and Maintenance Manual for my Waste Management System and agree to provide the necessary resources to properly implement its provisions.

09/28/2020

Operator Date

Plan For Pumping Holding Ponds

Operator Name Wulf Cattle Depot
Date 09/25/2020

County Corson **Pond ID or Legal Description** Holding Pond 4

- **Method Selected for Land Application of Wastewater**
  - X **Pipeline/Sprinkler System (Permanent):** ***Waste Storage Pond 2***
  - _____ **Big Gun Sprinkler (Temporary)**
  - _____ **Drag Hose System**
  - _____ **Tank Wagon:** ***Waste Storage Pond 1***
  - _____ **Other (Explain)** _____

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

Type Equip.	Obtain Where
Pump	Floating Pump on Pond 4
Pipe	To Existing Pivot on Field 3, 12B, 47B
Center Pivot	Existing on Field 3
Center Pivot	Existing on Field 12B & 47B

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

Legal Description	Landuse	Acres Available	Predom. Soil
SW 1/4, Section 4, T 21 N, R 27 E	Grass & Cropland	103.0	ShB
N 1/2, Section 9, T 21 N, R 27 E	Grass & Cropland	120.0	ShB

- **Holding Capacity of Ponds at Maximum Operating Level 11,218,511 gallons**
  Bottom of 25-year, 24-hour storage level. Pond is to be pumped within 10 days below level.
- Holding Capacity of Ponds at High Water Line **22,763,595** gallons
  Top of 25-year, 24-hour storage level (bottom of freeboard).

- **Holding Capacity of Ponds between Freeboard and Maximum Operating Elevation 11,545,084 gallons**
  Bottom of freeboard- Maximum Operating Elevation.

- **Application Rates**

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

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

  For more information and/or assistance in calculating application rates, refer to SD-CPA-63.

Section N: Record Keeping Guidelines

Recordkeeping

Keeping records plays a critical role in a manure management system. Records are essential to determine appropriate rates of manure to apply to the land while protecting surface and groundwater resources. It enables operators to make good annual and long-term decisions concerning efficient use of manure. Additionally, records serve to document compliance with regulations or voluntary adoption of best management practices.

Records should be maintained for five years or as otherwise instructed by specific federal and state laws, local county ordinances and/or program requirements.

At a minimum, track manure applications by collecting and keeping records of the following information:

- **Soil test results and recommendations for all fields receiviug manure (sampled and tested prior to hauling manure).**
- **Manure test results.**
- **Identity of the fields hauled to (including acres spread on and where in the field).**
- **Calculated "planned" manure application rate per field.**
- **Calculated "actual" manure application rate per field.**
- **Method of manure application.**
- **Date(s) and time(s) of manure application.**

The following additional records are recommended if the goal is to implement a whole farm nutrient budget program:

- **Soil test results and recommendations for the remaining fields receiving nutrients from other sources (i.e. commercial fertilizer).**
- **Form/rates of other nutrient sources applied per field.**
- **Crop planting and harvest dates and yields per field.**

Soil testing ou a whole farm basis provides fertility level information on all fields allowing operators to make decisions as to where manure nutrients can best be utilized.

The Manure Nitrogen and Phosphorus Application Worksheets provided with this plan serve as excellent recordkeeping tools to document test results and manure applications.

Section O: Manure Application Planning

Return to Main Menu

South Dakota
N & P Manure Application Determination

Three factors are considered when recommending a nitrogen-based or phosphorus-based manure application. They include (1) the current level of phosphorus in the soil, (2) the potential soil loss, and (3) the presence or absence of a 100 foot vegetated buffer in fields having certain soil phosphorus test levels. See table below.

Nitrogen need/Phosphorus Crop Removal Manure Application Determination						
Soil Test Phosphorus (ppm)		Predicted Soil Loss - Sheet and Rill Erosion (tons per acre per year)[1]				
		Less than 4		4 to 6		Greater than 6
		Min. 100 Foot Vegetated Buffer[2]		Min. 100 Foot Vegetated Buffer[2]		
Olsen	Bray-1	Yes	No	Yes	No	
0-25	0-35	Nitrogen Need	Nitrogen Need	Nitrogen Need	Nitrogen Need	No application
26-50	36-75	Nitrogen Need	Nitrogen Need	Nitrogen Need	Phosphorus crop removal[3]	No application
51-75	76-110	Nitrogen Need	Phosphorus crop removal	Phosphorus crop removal	Phosphorus crop removal	No application
76-100	111-150	Phosphorus crop removal	Phosphorus crop removal	Phosphorus crop removal	Phosphorus crop removal	No application
Greater than 100	Greater than 150	No application	No application	No application	No application	No application

[1] Refers to a calculated soil loss estimate using the Revised Universal Soil Loss Equation (RUSLE).
[2] Refers to the vegetated area width between manure or wastewater land application and a natural/manmade drainage, tile inlet or other conduit.
[3] Crop removal is the amount of phosphorus a planned crop removes in one crop year.

Note: A single application of phosphorus applied as manure may be made at a rate equal to the recommended phosphorus application for the entire crop rotation or multiple years in the crop sequence. When such applications are made, however, the application rate should not exceed the recommended nitrogen application rate for the planned crop.

Recommended Soil Sampling Methods for South Dakota

Photo courtesy of USDA-NRCS

R. Gelderman, manager, SDSU Soil Testing Laboratory
J. Gerwing, SDSU Extension soils specialist
K. Reitsma, South Dakota Department of Agriculture

Soil testing is your best way to evaluate the fertility status of a field or of areas within a field. When you send a sample off to the laboratory for plant-available nutrient analysis, a good soil sample that adequately represents your field or area gives you good results. A poor sample will only lead to an analysis of limited value and be a waste of your time and money.

The volume of the soil sample you will send in shrinks at each step from field to laboratory (Fig 1). Thus, it is imperative to start with a representative sample from the field. Depth of sampling, timing of sampling, equipment, sample handling, and sampling procedures all have an effect on a good representative soil sample.

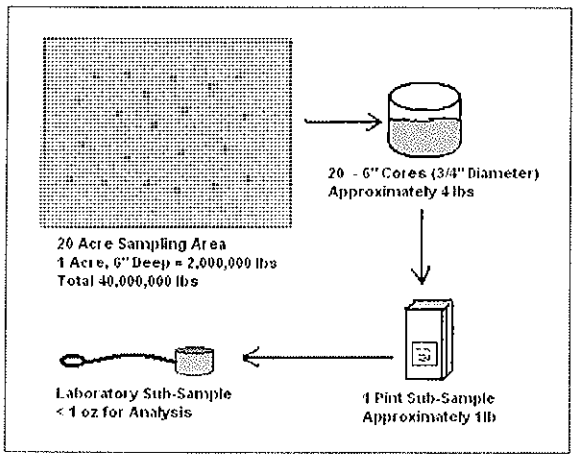
When and how often to sample?

About 70% of soil sampling in South Dakota fields is done in the fall with the remainder done in winter and early spring. Phosphorus (P), potassium (K), pH, soluble salt content, and micro- and most secondary nutrient soil tests are not affected by sampling time; therefore, soil samples for these tests can be taken any time during the year.

Soil biological activity affects nitrogen (NO_3^--N) and sulfur (SO_4^{2-}) soil test levels. Therefore, if you sample in the fall, it is recommended to wait until after soil temperatures are below 50° F. Above this temperature, nitrogen and sulfur are released from organic matter and crop residue; and below this temperature, nutrient releases normally become negligible.

Warmer than normal winters with an early spring sometimes lead to higher NO_3^--N levels in spring compared to fall, particularly after a soybean crop. Sampling small grain stubble with excessive regrowth can

Fig 1. Relative sample size to sampling area.



lead to lower soil test NO_3^--N levels because of nitrogen uptake by the regrowth. Winter sampling is dependent on the amount of snow cover, an issue in some years.

Whatever season you choose, sampling fields at approximately the same time each year will lead to more consistent results when comparing soil tests from year to year.

In general, soil tests for P, K, pH, soluble salts, calcium (Ca), magnesium (Mg), and micronutrients will change very little from year to year and need to be analyzed only every 2 to 3 years. In contrast, levels of NO_3^--N can change dramatically from year to year and should be analyzed every year prior to planting non-legume crops.

However, many producers and crop advisors prefer to test each nutrient every season to quickly develop a nutrient history for each field or area sampled. An erratic analysis due to sampling or laboratory error can easily be found by using this approach.

In summary, a soil sample for most soil tests can be taken anytime during the year. For most mobile nutrients, in particular NO_3^--N, samples should be taken in late fall (when soil temperatures are below 50° F), in winter, or in early spring.

Is sample depth important?

Many plant nutrients are concentrated near the soil surface and decrease with depth. Depth of sampling should be consistent between fields and over years to obtain comparable nutrient values.

Most soil tests were originally related to crop response using a specific soil sampling depth. It is important to keep using this sampling depth to obtain proper plant nutrient recommendations. Depth of sampling will depend on nutrient sampled, crop, and perhaps tillage.

Nutrients

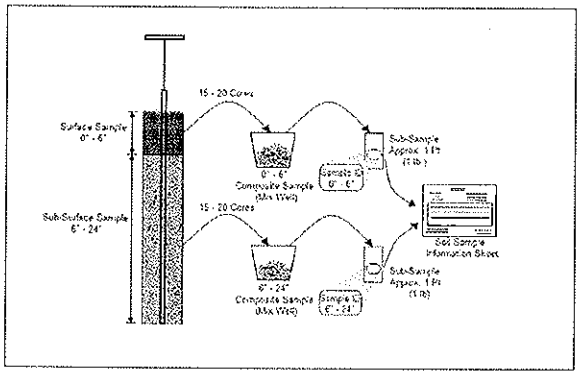
A 0-6 inch sample is recommended for P, K, pH, organic matter, soluble salts, zinc (Zn), iron (Fe), manganese (Mn), copper (Cu), and boron (B). A deep sample (24-inch) is recommended for mobile nutrients such as NO_3^--N, chloride (Cl), and sulfur (SO_4^{2-}-S). It is recommended to separate deep samples (0-24 inch) into two separate samples; one representing the 0-6 inch depth and the other a 6-24 inch depth (Fig 2).

If an even deeper (0-48 inch) sample is desired or required to determine deep NO_3^--N, separate this sample into 0-6, 6-24, and 24-48 inch depths.

Crop

A deep sample (6-24 inch along with the 0-6 inch depth) should be taken for all proposed non-legume crops and some legumes such as edible beans that have been shown to respond to additional nitrogen. For other proposed legume crops and permanent grass, a 0-6 inch depth is sufficient. However, cropping plans often change and a deep sample may be advised for these situations as well.

Fig 2. Dividing samples by depth increment.



A deep sample must be taken if the field is part of a Concentrated Animal Feeding Operation (CAFO) manure plan.

Tillage

With limited tillage, nutrients can become stratified or concentrated near the soil surface to a greater degree than with tillage. Soil pH can be lower at the soil surface with less tillage and increase with depth. If these conditions appear to be a problem for plant growth, it is recommended that samples be taken at 0-2, 2-4, and 4-6 inch depths to determine any pH or nutrient stratification.

If possible, it is recommended to soil sample before any tillage is completed. It is difficult to maintain the correct sample depth (especially of the surface soil) after tillage is done and surface conditions are very soft. Sampling the surface (0-6 inches) by hand may be the only option in such cases because of compaction of the loose surface soil in the sampling tube.

Sampling "holes"

Samples for multiple depth increments can be taken from a single core if equipment allows. Taking continuous cores is preferred but if equipment does not allow this; a surface sample may be taken, removed, and the sampling equipment placed in the same "hole" to obtain a deeper depth. Be sure to remove any topsoil contamination from subsequent cores when using the same hole. This procedure can be repeated until the desired depth is sampled.

Special sampling situations

Banding fertilizer with no-till, strip-till, ridge till, or seeding operations with little tillage can cause very high nutrient levels within these band areas. This can lead to

high levels of soil test variability from year to year in these fields. Research from Colorado State University suggests the following sampling procedure for these fields when the location of the band is known:

S = 8(BS)/12

Where:

S = Cores taken between bands

BS = Band spacing (inches)

The number of cores taken between the bands is related to the fertilizer band width. For example, if band spacing is 30 inches, 20 cores should be taken between the bands to be mixed with one core taken from within the band area. The mixture will be the composite sample for the area sampled and should provide a reasonable average for the sampling area.

An alternative is to sample only the area outside of the fertilizer band(s). This will provide a representation of soil test levels of non-banded soil areas.

If the location of the band is unknown, it is recommended to sample the area randomly or use a paired sample method. Paired sampling is used with a random sample pattern, taking an initial core and then a second core half the distance of the band spacing and perpendicular to the direction of the band. For example, if band spacing is 30 inches, randomly select a location for sampling; take the core; measure 15 inches in the direction perpendicular to the band; take a second core. Continue sampling in this manner until 15 to 20 locations have been sampled. A composite of these cores is then subsampled and submitted for analysis.

Sampling equipment

The right tools can make sampling easier and provide better cores and a better sample. Consider the sampling operation step by step and the tools you will need to take the sample, hold and mix the composite sample, contain the subsample, and record information about the sample.

Having alternate equipment to anticipate varied soils and sampling conditions can also help with sampling.

Sampling probe

A sample (core) probe is the best tool for taking a soil sample. These may be hand or hydraulic probes. Hydraulic probes can be truck (in-cab, side, or rear mount), or ATV or tractor mount. In-cab mount probes have become popular, as samples can be taken without leaving the cab of the pickup (Fig 3). ATV mounted probes can sometimes be used to sample under more adverse field conditions and will do minimal crop damage.

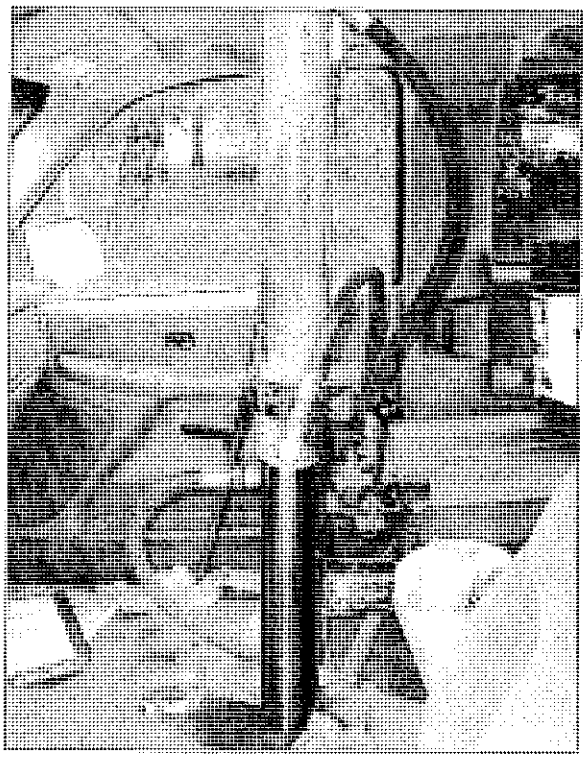
Sampling equipment considerations.

- Extra probe and tips
- Field information (i.e. maps, aerial photos, soils information)
- Sampling tool(s) to clean probe
- Tape measure or ruler
- Knife or sample divider
- Lubricant (i.e. WD-40)
- Clean plastic containers (at least 1 1/2 gallon)
- Sample bags/boxes
- Box or container to hold sample bags/boxes
- Permanent marker and/or pencil

Many types of probes are available, each with different characteristics and price ranges. Regardless of what type is used, a probe should provide a uniform soil core to the depth of insertion without compacting inside the probe. In practice this depends on many factors, including tillage practice, soil texture, soil moisture, and lubrication and characteristics of the probe.

Some probes work better in some situations than others. Experience is the best teacher. Always ask the vendor for references in your area to obtain their experiences with the product or equipment.

Fig 3. In-cab truck mount hydraulic probe.



Lubricants

Lubricants can be helpful in some soil conditions by preventing soil from plugging in the tube, especially when soils are wet. Water repellent petroleum-based lubricants such as WD-40™ can be used. In research studies this lubricant did not influence most soil tests.

Avoid or limit use of lubricants for samples where testing for soil carbon (organic matter) or micronutrients. Cooking sprays or crop oils may influence NO_3^--N mineralization on some soils, affecting analysis.

It is best to take the sample without a lubricant if possible. However, use one if necessary to get a good sample.

Other tools

Containers that can hold the cores from which you will make a composite sample are recommended to be made of plastic and hold a volume of 1 1/2 gallons or more. This allows for additional room for mixing and a reduced chance of sample contamination. Mark each container with a permanent marker to indicate depth intervals.

Avoid using containers that previously held materials such as hydraulic fluid, motor oil, fertilizer, feed, or other materials that may contain residues. Tools or containers that are galvanized or rusted should be avoided, as these could influence micronutrient analysis.

Sample handling and shipping

Soil NO_3^--N levels can increase substantially if samples are left moist and warm. Samples intended for NO_3^--N analysis should be air dried or frozen within 12 hours of collection. If possible, keep these samples cool while in the field. To dry, spread the sample out on clean paper in a dust-free heated room. Samples will usually air dry within 6 to 12 hours by directing a household fan on them. If frozen, pack the frozen samples into a shipping container. During cooler weather the samples should be fine if arriving at the laboratory within 2 days.

Use latex/rubber gloves to mix and handle samples for chloride analysis to limit chloride contamination from perspiration.

For some high clay content soils or soils that are very moist, the cores will not break up easily to obtain a mixed, composite, pint sample. In these cases it may be necessary to take the entire sample out of the field for drying and/or grinding so an adequate subsample can be obtained.

Mail soil sample information under separate cover or, if mailing in the soil shipping container, seal the information in a plastic bag, especially if the samples are frozen or moist.

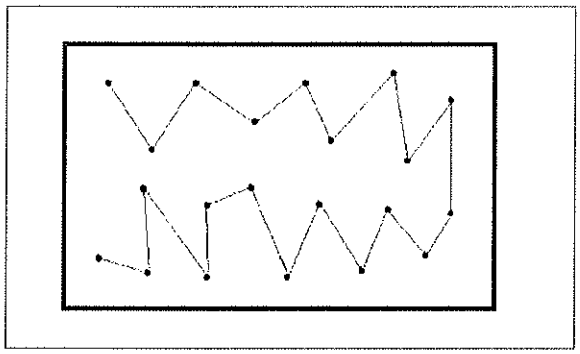
Field sampling methods

Fields may be divided into smaller parcels or "zones" or sampled as a whole field. The strategy used to sample a field will often dictate the number of samples submitted for analysis.

Whole field composite method

Traditionally this is the method that many consultants, dealers, and producers in South Dakota follow to obtain a soil sample. The procedure consists of taking at least 15 random cores from the field and compositing (mixing) by depth increment (Fig 4). The advantage of this system is that it is quick, relatively inexpensive, and fairly reproducible.

Fig 4. Random, whole field composite sampling.



With this method it is advised to avoid unusual areas or sample these areas separately. Identifying these outlier areas is sometimes difficult. The whole field method also does not determine what nutrient variability exists in the field.

If substantial nutrient variability does exist, use of the whole field composite method can result in over- or under-fertilization on large areas of the field. This can be expensive, either from costs from applying unneeded nutrients or from yield loss due to under-fertilization.

Other field soil sampling methods do a better job of measuring the nutrient variability within a field, and they provide a better picture of available plant nutrients. The following is a brief summary of methods currently recommended in South Dakota.

Sampling for within-field variability

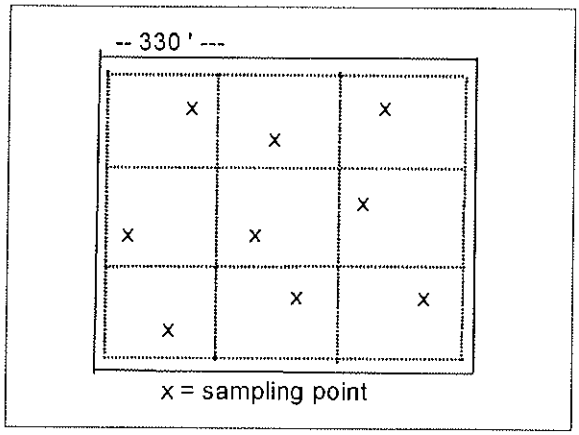
The goal for within-field sampling is to determine the nutrient, salt, or pH variability within a field. Once this is determined, the nutrients are mapped and fertilizer and/or lime is variably applied.

Grid sampling

The field is divided into rectangular grids and a sample is taken from each grid. Each grid sample is usually a composite of 6 to 8 cores.

In some procedures the cores may be taken in a "point," usually from a circle of 6 to 8 feet around the point located in the grid of interest. If this system is used the points should be staggered in the grid as one goes from one grid to the next (Fig 5). Because of past management practices "streaks" of higher nutrient concentrations can often be found from one end of the field to the other. Staggering the point samples can avoid bias in the soil tests.

Fig 5. A 2 1/2-acre grid pattern, staggered system.



A number of studies have determined that the largest grid size that will adequately measure nutrient variability for a field should be no more than 2.5 acres in size. In fact, many studies have shown the size should be less than one acre. This is cost prohibitive in most situations, and many workers have found that the nutrient variability within a grid may be as high as that within the whole field.

Consider using a grid system where the field history is unknown, the non-mobile nutrients (P, K, Zn) are of primary importance and are high either from past fertilization or manure applications, where small fields have been merged into one or more large fields, or where year to year variability in non-mobile nutrient tests are high.

Directed sampling

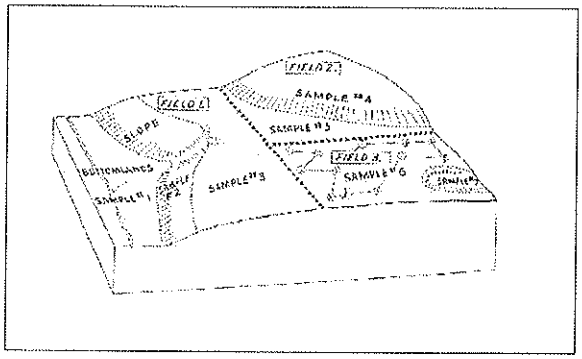
A more direct approach to sampling can be done by assuming there is a logical reason to nutrient variability in the field. Directed sampling is also called "zone sampling," "management zone sampling," or "smart sampling."

Detailed information about a field, such as yield monitor maps, remote sensing imagery, digital soil survey or topographic maps, and/or electrical conductivity data, can all help define nutrient management zones.

Sampling by landscape/topography

One of the oldest procedures used to divide fields into variable nutrient zones is sampling by visual landscape differences (Fig 6). Perhaps uplands are one sample, slopes another, and low ground another.

Fig 6. Soil sampling method based on landscape.



Logically this make sense in that you would expect the sloped, eroded areas would have less nutrients than the low ground where soil and nutrients tend to accumulate. The higher (less sloping) landscape areas usually would be in between.

Sampling zones by landscape can be done visually, with aerial or satellite photos, or by using elevational data from GPS units. A study in North Dakota on a 40-acre field required only four to seven samples (zones), compared to 36 for a grid sampling approach. A field with four landscape zones would have four separate samples, each with a minimum of 15 cores.

Other methods of directed sampling

There are other logical reasons to use directed soil sampling. One of the most common forms of directed sampling is to use yield zones within the field. Reasons to use this method include: 1) soil areas with high yields may lead to lower soil nutrient levels, because more nutrients were removed as more grain was produced, and 2) areas with lower yields may be limited by nutrients.

In other cases, yield variability is not because of nutrient limitations but due to other growth factors such as soils, water limitations, drainage, etc.

Other directed sampling methods include using aerial or satellite imagery that shows soil color differences or crop growth patterns or color.

Measuring soil conductivity with an on-the-go sensor also may help define management or sampling zones. If the measured conductivity relates to plant nutrient levels, then such a system is useful. Knowledge of the field and other layers of information can also be useful when establishing management zones.

Recent or older field maps such as from the Farm Service Agency (FSA) will provide a reasonable aerial photograph of the field. County soil surveys provide aerial photographs with soil phase mapping units imposed over an aerial photograph. These maps can be useful for deciding if the field should be divided into sampling zones. Older aerial photographs may be useful in identifying areas to avoid such as old farm yards, fencelines, or other

features that may no longer exist but can influence a soil test.

Combinations of the various directed sampling methods listed above are also sometimes used. For example, combining yield zones, conductivity areas, and landscapes with a computer program or "black box" approach could be used in designing management zones. Whatever the approach, check the system with ground truth information. Use of a program alone is no substitute for field knowledge.

It is important to remember how these different sampling methods fit with your fertilization program. In the whole field approach, it is assumed that the whole field is somewhat uniform and the field is fertilized the same. With the grid sampling method, the analysis from each grid is used to create a variable map (using various statistical techniques) to determine the amount of fertilizer to use. With directed soil sampling, some identification (i.e., yields, landscapes, aerial photos or some combination) is used to make the management zone maps. These areas are then sampled, analyzed, mapped, and fertilized according to area soil test results.

With any of these sampling methods—whole field composite, grid, or directed—locating the core point with GPS may lead to more consistent results when resampling these fields or areas.

Review

Any good soil fertility program begins with a good soil test, which begins with a good soil sample. For any field sampling method, the basics of good sampling remain the same and should be followed. For many producers a whole field randomized composite sampling method is a good first step. However, for those wishing to obtain more knowledge about nutrient variability within a field and to possibly increase productivity, a more intensive sampling program should be used.

For more information, contact:

Soil Testing Laboratory
Box 2207A
South Dakota State University
Brookings, SD 57007-1096
Telephone: (605) 688-4766
Fax: (605) 688-4667
Web: http://plantsci.sdstate.edu/soiltest/Index.html
E-Mail: SDSU_Soillab@sdstate.edu

South Dakota State University
Cooperative Extension Service
Box 2207A
Brookings SD 57007
Telephone: (605) 688-4772
FAX: (605) 688-4667
Web: http://sdces.sdstate.edu/index.cfm

Available online: http://agbiopubs.sdstate.edu/articles/FS935
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For information or assistance with *management options*, contact your local:

- Conservation District,
- Cooperative Extension Service or
- Natural Resources Conservation Service.

South Dakota Association of Conservation Districts
P.O. Box 275
Pierre, SD 57501-0275
(800)729-4099
Fax: (605) 895-9424
www.sdconservation.org
info@sdconservation.org

USDA Natural Resources Conservation Service
Federal Building
200 Fourth Street SW Huron, SD 57501
(605)352-1200
Fax: 605-352-1270
www.sd.nrcs.usda.gov
publicaffairs@sd.usda.gov

South Dakota Cooperative Extension Service/South Dakota State University

Department of Agricultural and Biosystems Engineering
Box 2120, SDSU
Brookings, SD 57007
(605)688-5144
Fax: (605)688-6764
charles_ullery@sdstate.edu

Department of Plant Science
Box 2207A, SDSU
Brookings, SD 57007
(605)688-4772
Fax: (605)688-4667
james_gerwing@sdstate.edu

South Dakota Department of Agriculture
Office of the Secretary
Foss Building, 523 E. Capitol, Pierre, SD 57501
(800) 228-5254 ·(605) 773-3375 ·Fax: (605) 773-4003
www.state.sd.us/doa

For information or assistance with *regulatory requirements*:

South Dakota Department of Environment and Natural Resources
Surface Water Quality Program
Foss Building, 523 E. Capitol Avenue
Pierre, SD 57501-3182
(800) GET-DENR ·(605) 773-3351 ·Fax: (605) 773-5286
www.state.sd.us/denr/DES/surfacewater/feedlot.htm

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SD-NRCS-FS-36 · Nov. 2002

Sampling Manure for Nutrient Management

Photo courtesy USDA NRCS SD

MANURE AS A RESOURCE SERIES

Sampling Manure for Nutrient Management

Nutrients needed for crop production can be supplied by manure, commerical fertilizer, or a combination of the two.

Regardless of the source, nutrients must be applied in the right amount to meet crop production needs and prevent surface and ground water pollution.

By knowing the nutrient content of the manure applied, producers can adjust the amount of commereial fertilizer needed to meet crop requirements.

Producers have two options for determining the nutrient content of manure produced on their farm:

1. Estimate using published values (see table below) or
2. Use the results of a laboratory analysis.

An analysis estimates the nutrients in manure from a specific operation. Nutrient values listed in publications are averages from samples tested over a period of several years.

A laboratory analysis is the preferred and most accurate of the two methods. All permitted facilities are required to use a lab analysis.

The nutrient content of manure varies with the type, age, and weight of livestock; feed program; and manure handling system.

At minimum, manure should be tested for total nitrogen, inorganic nitrogen, total phosphorus and total potassium. An analysis for these nutrients provides the information needed to develop a nutrient management plan.

Estimated Nutrient Content of Selected Types of Manure[1]

	Nitrogen Content	Phosphorus Content	Potassium Content
Solid Manure (Lbs/ton)			
Beef or Dairy Cattle	5	5	5
Broilers or Turkeys	25	40	30
Liquid Manure (Lb/1,000 gallons)			
Dairy	15	10	20
Swine Finishers	40	35	30

[1]Adapted from Fertilizer Recommendations Guide (EC750), South Dakota State University Cooperative Extension Service. For additional estimated nutrient content of manure values see Midwest Plan Service Publication MWPS-18.

This publication describes how to collect, handle, and ship manure samples. For information about how to interpret manure test results, refer to "Using Results from a Manure Analysis" (SD-NRCS-FS-38). For information about land application, refer to "Calibrating Manure Spreader Application Rates" (SD-NRCS-FS-43). Brochures are available online at SD DENR's website. Visit: http://www.state.sd.us/denr/DFTA/WatershedProtection/WQInfo.htm.

How to Sample Manure

The accuracy of a laboratory analysis depends on the quality of the manure sample received. A solid manure sample collected as close to the time of land application as possible provides the best information about its fertilizer value. It is important, however, to allow the laboratory time to complete the analysis and return the results. Usually three weeks is sufficient. Liquid manure must be agitated before sampling and is usually land applied after the sample is taken. Therefore, it is suggested that producers handling liquid manure use the average of several years of nutrient test results to estimate the nutrient level in the manure. When information from past years is not available, cooperative extension and conservation district professionals can provide publications that list the estimated nutrient levels commonly found in liquid manure.

SAMPLING SOLID MANURE

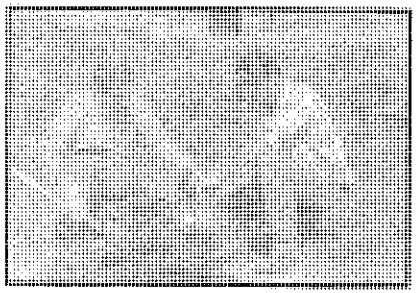

Photo courtesy USDA NRCS SD

An accurate lab analysis of solid manure hinges on collecting a representative sample.

1. Collect manure from at least 10 different locations in the barnyard or feedlot. The locations selected should be similar in moisture, feed, hay and bedding content. Avoid areas near waterers, drains, and feedbunks where materials other than manure often accumulate. If sampling stockpiled manure, collect manure from several depths. Avoid the exposed outer layer of the pile.
2. Dump the manure collected on a hard, flat surface. Use a shovel or pitchfork to mix the manure until the pile looks uniform.
3. Take several small samples from the mixture until about a gallon has been collected.
4. Place the mixture in a heavy weight plastic freezer bag. Squeeze the bag to remove the air. Place the bag in a second freezer bag to prevent leakage.
5. Freeze or store the sample in a cool place until ready to ship. See information at right for sample identification and shipping instructions.

SAMPLING LIQUID MANURE

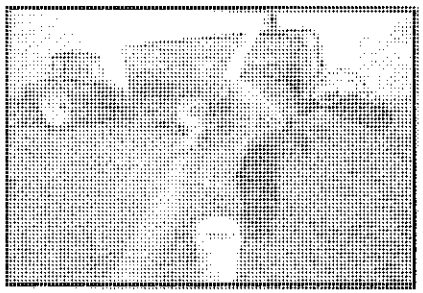

Photo courtesy USDA NRCS SD

Sampling from a loading pipe or tank spreader is the preferred method of collecting a liquid manure sample.

1. Agitate the manure in the storage facility thoroughly before loading the tank spreader. If this step is omitted, the sample will not accurately estimate the nutrient value of the manure in the storage pit.
2. Collect one quart samples from at least five different tank spreader loads using a clean plastic container.
3. Pour the samples into a clean, large plastic pail.
4. Thoroughly stir the contents of the pail. Use a long handled dipper to transfer several cups of the swirling mixture to a clean, one quart **plastic** bottle until the liquid is about two inches from the top of the bottle. **DO NOT FILL TO THE TOP!**
5. Place the bottle in a heavy weight resealable plastic freezer bag to prevent leakage.
6. Freeze or store the sample in a cool place until ready to ship. See information at right for sample identification and shipping instructions.

SAMPLE IDENTIFICATION AND SHIPPING

1. Attach a label to the bag or bottle of manure. List:
   - Name
   - Mailing address
   - Telephone number
   - Sample site (feedlot, pit, pond)
   - Type of manure (beef, dairy, swine, chicken, turkey)
   - Date the sample was collected.
2. Complete a laboratory information sheet. If possible, use an information sheet from the lab that will complete the test. Visit the county Cooperative Extension or conservation district office for assistance in obtaining forms.*
3. Place the frozen or refrigerated sample and laboratory information sheet in a styrofoam or similar insulated container. Add cold packs and packing materials to protect the sample during shipment.
4. Deliver the sample to the lab or ship by overnight mail or courier. If using regular mail, ship the sample early in the week so that it arrives at the lab by Thursday. Samples that arrive on the weekend may warm up and start to decompose. The nitrogen test for these samples will be inaccurate.

Ship samples to:
Analytical Services
Olson Biochemistry Labs, ASC 133
South Dakota State University
Box 2170
Brookings, SD 57007-1217
Phone: (605) 688-6171
Fax: (605) 688-6295

***A form for submitting manure samples to the lab at SDSU is available online. Visit:** http://anserv.sdstate.edu/ and click on "Submission Form" to download the file. Fees are listed.

LIVESTOCK MANURE SAMPLE SUBMISSION FORM

Analytical Services, Olson Biochemistry Labs, ASC 133
South Dakota State University, Box 2170, Brookings, SD 57007-1217
Phone: 605-688-6172 FAX: 605-688-6295
Web address: http://anserv.sdstate.edu

Use one sheet for each sample.

Bill:

Name:_____

Address:_____

City, State, Zip:_____

Phone: _____ FAX: _____

Email: _____

Copy:

Name:_____

Address:_____

City, State, Zip:_____

Phone:_____ FAX: _____

Email: _____

Sample Identification_____

Date Collected:_____

Sample Information (check **only one** of each group)

Species: ___Beef ___Dairy ___Swine ___Poultry ___Other ___Mixed

Report as: ___lb/ton (solid) ___lb/1000 gallons (liquid)

Storage System/Solid: __Daily scrape, __Manure pack, __Open lot, __Deep pit(poultry), __Litter(poultry), __Manure stacking.
Storage System/Liquid: __Anaerobic pit, __Above ground tank, __Earthen storage (pond), __Lagoon

Payment Enclosed: $_____ All fees subject to 4% sales tax and applicable city tax.
Charges for out of state residents are 1.5 times those listed below.
Make Checks Payable to: Olson Biochemistry Labs

For information on collecting samples refer to SD-NRSC-FS-36, "Sampling Manure for Nutrient Management" (11/2002) available from your local Conservation District /NRCS or Cooperative Extension Service office.

_√_ **$10.00 Sample handling and preparation. (Required for all samples)**

___ **$40.00 N, P, K and NH_4-N (required for DENR general permit coverage).**

___$28.00 N, P, K analysis.

___$19.00 P and K analysis.

Individual Tests

___$ 9.00 Total nitrogen (N)
___$15.00 Nitrate-nitrogen ($NO_3$-N)
___$12.00 Ammonium Nitrogen (NH_4-N)
___$24.00 Urea-nitrogen, includes Ammonium N
___$12.00 Selenium (Se)
___$14.50 Sulfur (S)
___$ 4.50 Moisture
___$ 4.00 Density
___$ 5.00 pH

___Check desired element(s). First element is $14.50 and $4.50 for each additional element.

___Phosphorus (P)
___Potassium (K)
___Sodium (Na)
___Iron (Fe)
___Zinc (Zn)
___Calcium (Ca)
___Cobalt (Co)
___Magnesium (Mg)
___Manganese (Mn

___Check desired element(s). First element is $27.00 and $14.50 for each additional element.

___Arsenic (As) ___Lead (Pb) ___Cadmium (Cd) ___Molybdenum (Mo)

Element profile by ICP. Inquire.

Note: All elements are "total" unless otherwise indicated. P is reported as P_2O_5 and K is reported as K_20.

For information or assistance with *management options*, contact your local:

- Conservation District,
- Cooperative Extension Service, or
- Natural Resources Conservation Service.

South Dakota Association of Conservation Districts
P.O. Box 275
Pierre, SD 57501-0275
(800) 729-4099
Fax: (605) 895-9424
www.sdconservation.org
info@sdconservation.org

South Dakota Cooperative Extension Service/South Dakota State University

Department of Agricultural and Biosystems Engineering
Box 2120, SDSU
Brookings, SD 57007
(605) 688-5144
Fax: (605) 688-6764
charles_ullery@sdstate.edu

Department of Plant Science
Box 2207A, SDSU
Brookings, SD 57007
(605) 688-4772
Fax: (605) 688-4667
james_gerwing@sdstate.edu

USDA Natural Resources Conservation Service
Federal Building
200 Fourth Street SW
Huron, SD 57501
(605) 352-1200
Fax: 605-352-1270
www.sd.nrcs.usda.gov
publicaffairs@sd.usda.gov

South Dakota Department of Agriculture
Office of the Secretary
Foss Building, 523 E. Capitol, Pierre, SD 57501
(800) 228-5254 · (605) 773-3375 · Fax: (605) 773-4003
www.state.sd.us/doa

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South Dakota Department of Environment and Natural Resources
Surface Water Quality Program
Foss Building, 523 E., Capitol Avenue
Pierre, SD 57501-3182
(800) GET-DENR ·(605) 773-3351·Fax: (605) 773-5286
www.state.sd.us/denr/DES/surfacewater/feedlot.htm

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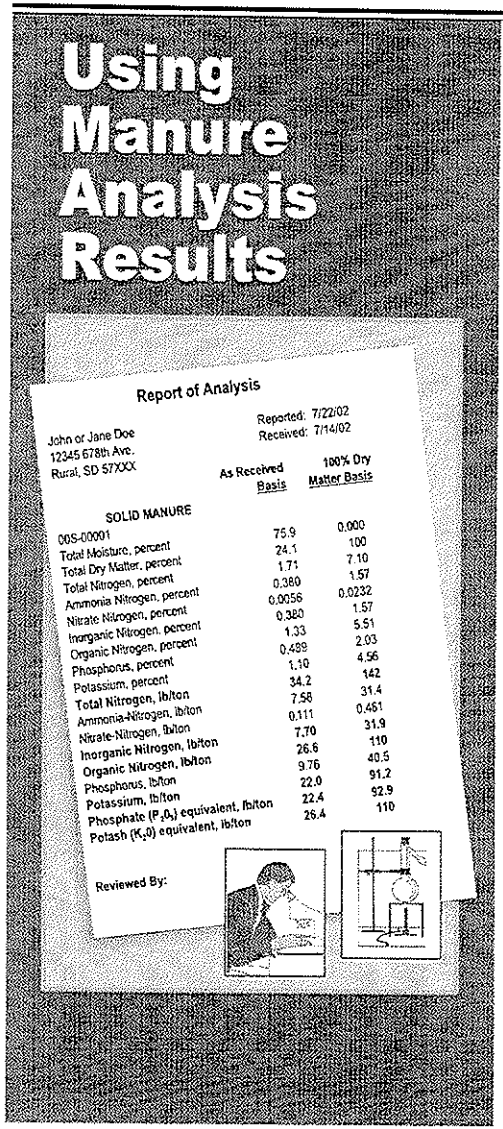
Programs and services are available to everyone on a nondiscriminatory basis.

SD-NRCS-FS-38 · March 2003

Using Manure Analysis Results



MANURE AS A RESOURCE SERIES

Using Manure Analysis Results

Livestock manure is a valuable resource. When applied to cropland, manure:

- provides nutrients for crop production,
- improves soil structure and water holding capacity, and
- reduces the amount of commercial fertilizer needed to reach yield goals.

To fully realize the fertilizer value of manure and protect the environment, a nutrient management plan is recommended for each field that will receive manure. The plan is a plant food budget for the field. Balancing the nutrients added with uptake by the crop prevents nutrient buildup and helps prevent surface and ground water pollution.

Nutrient management plans include:

- yield goals for the crops to be grown,
- plant nutrients needed to reach the goals,
- soil test results for each field,
- an estimate, based on a lab analysis, of the nutrients that will be supplied by manure
- credits for nutrients supplied from other sources such as legumes,
- the amount of commercial fertilizer required to meet the remaining crop production needs, and
- identification of areas where manure should not be applied.

For information about sampling manure and calibrating application equipment see:

"Sampling Manure for Nutrient Management" (SD-NRCS-FS-36) and "Calibrating Manure Spreader Application Rates" (SD-NRCS-FS-43). Brochures are available on SD DENR's website. Visit:

http://www.state.sd.us/denr/DFTA/WatershedProtection/WQInfo.htm

An accurate estimate of the nutrients available from manure is influenced by how:

- the manure sample was collected, prepared, and shipped; and
- the manure will be applied.

Poorly handled samples do not provide an accurate estimate of the nutrients contained in the manure. Improperly calibrated equipment will result in over or under applying manure. Making either mistake can be costly:

- expected nutrients from manure may be insufficient to reach yield goals,
- more, or less, commercial fertilizer than needed could be applied, and
- nutrient build up in the soil may affect future manure applications to the field.

Worksheets for preparing a nutrient management plan are available at Cooperative Extension Service, Natural Resources Conservation Service, and conservation district offices, or by visiting:

http://www.state.sd.us/denr/DES/Surfacewater/ManureMgt/Tools.htm

NUTRIENT AVAILABILITY

The nitrogen, phosphorus and potassium in manure are present in two forms:

- organic compounds and
- inorganic compounds.

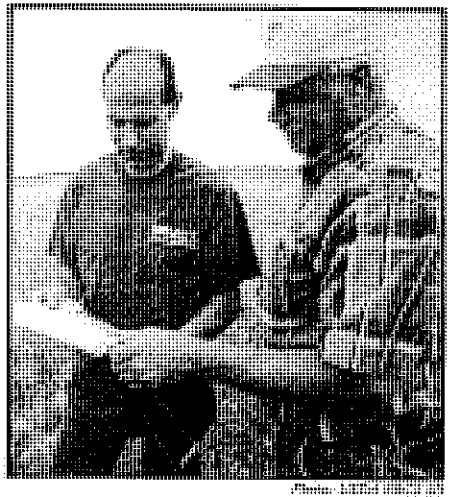
Nutrients become available for plant growth when organic compounds decay. During the decay process, bacteria and fungi convert the organic compounds to inorganic compounds by a process called mineralization. The rate of mineralization is affected by temperature, moisture, soil chemistry and time. Therefore, not all of the nutrients in the organic compounds are available for use by plants the year manure is applied.

Mineralization occurs most rapidly in warm, moist, neutral to slightly alkaline soils. For South Dakota, a common rule of thumb for nitrogen mineralization is:

About one-third of the organic nitrogen becomes available each year for three years following a manure application.

The South Dakota Experiment Station found the following amounts of the nutrients are usually available for crop production during the year the manure is applied:

- Inorganic Nitrogen 100 percent
- Organic Nitrogen 35 percent
- Phosphorus 80 percent
- Potassium 100 percent



USING THE ANALYSIS REPORT

Most laboratory reports provide information about the moisture, dry matter and nutrient content of the manure sample submitted. The format of the report may vary with the type of manure submitted, the analysis requested, and the laboratory completing the analysis. The test results are usually reported:

- as a percent by weight per ton or 1,000 gallons, or
- on both an "**As Received**" and "**Dry Matter**" basis.

The cover of this publication shows a report format used by many laboratories.

Manure is normally applied in the form it was sampled. Therefore, the "**As Received**" results must be used to plan a manure application. If "**As Received**" values are not provided by the lab, "**Dry Matter**" values can be converted to "**As Received**" using the following formula:

Formula for the Conversion Of "Dry Matter" to "As Received"

$$\%N_{AR} = \frac{\%N_{DM} \times \%\ DM}{100}$$

Where:

N_{AR} = % Nutrient As Received
N_{DM} = % Nutrient Dry Matter Basis
DM = % Dry Matter

For example, using the formula to convert dry matter nitrogen to **"As Received"** for the sample analysis shown on the cover:

$$\%N_{AR} = \frac{142 \times 24.1}{100} \qquad \%N_{AR} = 34.2$$

Fertilizer recommendations are based on the:

- inoganic (N) nitrogen and
- phosphorus (P_2O_5) and potash (K_2O) oxide equivalents

If the analysis report does not provide phosphorus and potash equivalents, the values can be determined using the formulas shown below. Each formula is accompanied by an example using numbers from the sample lab report shown on the cover:

lbs. P_2O_5 = Lbs. Phosphorus x 2.29
22.4 = 9.76 x 2.29

lbs. K_2O = Lbs. Potassium x 1.20
26.4 = 22.0 x 1.20

CALCULATING THE NUTRIENT VALUE OF MANURE AS FERTILIZER

The fertilizer value of manure is calculated using information provided by the laboratory report. Using the report shown on the brochure cover as an example, the fertilizer value is:

Fertilizer Values *(lbs./ton)*

Nitrogen:	Inorganic Nitrogen	7.7
	+ Organic Nitrogen (26.6 x 0.35)	9.3
	Total Nitrogen	17.0
Phosphorus:	P_2O_5 equivalent (22.4 x 0.80)	17.9
Potassium:	Potash (K_2O) equivalent	26.4

The example shows only the estimated nutrients available for crop production during the year the manure was applied. It does not account for nutrients lost during application.

The nutrients from manure applied during the previous two years must also be considered in a nutrient management plan (see Nutrient Availability section).

The method used to apply manure and the length of time between application and incorporation reduces the nutrients available for plant growth. Producers can expect a one to five percent nitrogen loss with same day incorporation or a knifing application. After four days, the nitrogen content of manure left on the soil surface may decrease by as much as 30 – 40 percent through volatilization. Thirty percent of the nitrogen content of manure applied through sprinkler irrigation systems is commonly lost to the atmosphere.

Delays in incorporating manure increase the potential for phosphorus to pollute streams and lakes if run off occurs.

To reduce nutrient losses and prevent pollution:

- incorporate surface applied manure within 24 hours, and
- do not spread manure on frozen or snow covered ground.

For information or assistance with *management options*, contact your local:

- Conservation District,
- Cooperative Extension Service or
- Natural Resources Conservation Service.

South Dakota Association of Conservation Districts
P.O. Box 275
Pierre, SD 57501-0275
(800) 729-4099
Fax: (605) 895-9424
www.sdconservation.org
info@sdconservation.org

USDA Natural Resources Conservation Service
Federal Building
200 Fourth Street SW
Huron, SD 57501
(605) 352-1200
Fax: 605-352-1270
www.sd.nrcs.usda.gov
publicaffairs@sd.usda.gov

South Dakota Cooperative Extension Service/South Dakota State University

Department of Agricultural and Biosystems Engineering
Box 2120, SDSU
Brookings, SD 57007
(605) 688-5144
Fax: (605) 688-6764
charles_ullery@sdstate.edu

Department of Plant Science
Box 2207A, SDSU
Brookings, SD 57007
(605) 688-4772
Fax: (605) 688-4667
james_gerwing@sdstate.edu

South Dakota Department of Agriculture
Office of the Secretary
Foss Building, 523 E. Capitol, Pierre, SD 57501
(800) 228-5254 · (605) 773-3375 · Fax: (605) 773-4003
www.state.sd.us/doa

For information or assistance with *regulatory requirements*:

South Dakota Department of Environment and Natural Resources
Surface Water Quality Program
Foss Building, 523 E., Capitol Avenue
Pierre, SD 57501-3182
(800) GET-DENR · (605) 773-3351 · Fax: (605) 773-5286
www.state.sd.us/denr/DES/surfacewater/feedlot.htm

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SD-NRCS-FS-43 · June 2002

Calibrating Manure Spreader Application Rates

Photo courtesy USDA NRCS SD

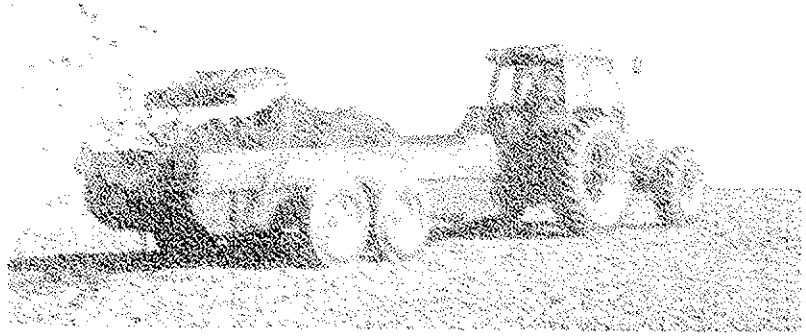
MANURE AS A RESOURCE SERIES

Calibrating Manure Spreader Application Rates

One of the most critical components of a comprehensive nutrient management plan that includes animal manure is the **application rate**. Calibration of a manure spreader helps livestock producers use the nutrients contained in manure more efficiently.

Calibrating a spreader takes one or two hours but can save hundreds of dollars in fertilizer costs. This publication describes two calibration methods that effectively estimate the amount of nutrients applied to a field.

Applying the nutrients in manure according to crop needs reduces production costs and protects water resources.



One of the keys to successful nutrient management is a sound manure application plan. This includes:

- Setting realistic yield goals.
- Knowing the nutrients available through regular soil and manure tests.
- Crediting nutrient contributions from other sources, such as legumes.
- Keeping records of the rate, method and date of past manure and commercial fertilizer applications.
- Using best management practices to reduce runoff and the leaching of nutrients.

Calibrating Manure Spreader Application Rates

The two best approaches for calibrating a manure spreader are the **LOAD-AREA** and **WEIGHT-AREA** methods. The load-area method is the most accurate and can be used for both liquid and solid manure. The weight-area method works only with solid or semi-solid manure.

LOAD AREA METHOD

The load area method is a three step process.

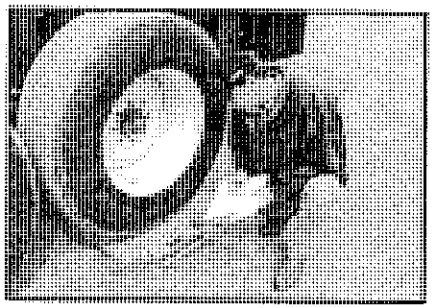


Photo courtesy Davison County Conservation District

1. **Determine the amount of manure in the spreader.** The most accurate way to determine the amount of manure in a spreader is weighing the spreader when it is empty and again when it is full. For a reliable estimate of spreader capacity, weigh several representative spreader loads (recommend five) to determine the average gross weight. Subtract the empty spreader weight. Then, calculate the average net loaded weight.
2. **Determine the area of spread.** The "area of spread" is determined by measuring the length and width of the ground covered by the manure. Width measurements near the beginning and end of the spread pattern should be avoided because the spreader may not be operating at full capacity. Allow for the overlap of adjacent passes.
3. **Calculate the application rate.** The application rate is calculated using the formula for either liquid or solid manure.

Formula for Solid Manure:

$$\text{Tons per acre} = \frac{\text{Average Loaded Weight (lbs.)} \times 21.8\ ^{1/}}{\text{Distance Traveled (ft.)} \times \text{Width of Spread (ft.)}}$$

Formula for Liquid Manure:

$$\text{Gallons per acre} = \frac{\text{Tank Volume (gal.)} \times 43{,}560\ ^{2/}}{\text{Distance Traveled (ft.)} \times \text{Width of Spread (ft.)}}$$

WEIGHT AREA METHOD

When a scale is not available, the application rate of a box spreader can be estimated by collecting manure on a tarp or piece of heavy material.

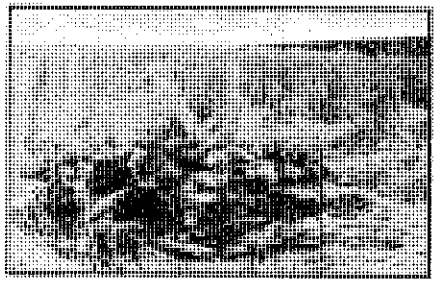


Photo courtesy USDA NRCS SD

The weight area method is less accurate than the load area method. This method consists of eight steps:

1. Prepare/cut three 56 inch x 56 inch tarps or pieces of heavy material (*This size equals 1/2000 of an acre*). The pounds of manure collected on a 56 inch square equals tons applied per acre.
2. Weigh one of the clean tarps and a large bucket on a platform scale. Record the weight.
3. In a field, anchor the three tarps ahead of the spreader near the beginning, middle and end of the area that will be spread with one load.
4. Drive over the three tarps at a normal speed to collect representative manure samples.
5. Fold and place the first tarp in the empty bucket without spilling the manure.
6. Weigh the bucket, tarp and manure. Subtract the weight of the clean tarp and bucket recorded in Step 2.
7. Repeat the process for each of the two remaining tarps.
8. Calculate the average weight (pounds) of the manure collected. This value equals the *tons of manure applied per acre.*

1/ Factor for converting pounds to tons and square feet to acres. (21.8 = 43,560 sq. ft. per acre divided by 2000 lbs./ton)
2/ The factor for converting square feet to acres = 43,560.

DETERMINING THE AREA OF SPREAD

The "area of spread" is the length and width of the ground covered with one load of manure. *The area of spread is affected by speed and equipment settings.* Spreaders discharge manure at varying rates depending on travel and PTO speed, gear box settings, and discharge openings. It is important to adjust the spreader so the spread pattern is uniform. Accurately measuring the length and width of this area is essential.

To determine width, measure two adjacent spreads and divide by two to find the "effective" spread width. This accounts for overlapping which is often required to make a more uniform application.

The length of spread is determined using the following three values:

1. desired manure application rate (based on soil and manure tests),
2. width of the manure spread, and
3. manure spreader holding capacity (weight and/or volume).

With these values, calculate the distance or length of spread using one of the following formulas:

Formula for Solid Manure:
The Travel Distance (feet) per Load Equals:

$$\frac{\text{Average Load Weight (lbs.)} \times 21.8\ ^{1/}}{\text{Width of Spread (ft.)} \times \text{Appl. Rate (tons per acre)}}$$

Formula for Liquid Manure:
The Travel Distance (feet) per Load Equals:

$$\frac{\text{Tank Volume (gallons)} \times 43{,}560\ ^{2/}}{\text{Width of Spread (ft.)} \times \textit{desired} \text{ Appl. Rate (gallons/acre)}}$$

Spread a load. If the distance traveled does not equal the calculated distance, adjust speed or equipment settings.

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCE CONSERVATION SERVICE

SD-CPA-63C
4/08

Manure Spreader Calibration Worksheet

Spreader Calibration for: **Wulf Cattle Depot** County: Corson

Date of Calibration: _____ Application Type: ○ Liquid ○ Solid

Manure Analysis **N** _____ **P_2O_5** _____ **K_2O** _____

Solid Manure Calibration:

Type of Spreader: _____ Size of Spreader (Bu.): _____

Moisture Content: ○ Wet ○ Moist ○ Dry Bedding Amount: _____

Scale #	Spreader Empty Weight (lbs.)	Spreader Full Weights (lbs.) Load Number 1	2	3	4	5	
1							
2							
3							
4							Average load Weight (lbs. and tons)
5							
6							
Totals =	-						lbs.
	Tons/Load						Tons

Actual application rate:

Distance Traveled _____ ft. x Spread Width _____ ft. = _____ Acres[1]

Actual Manure Applied: _____

Nutrients Applied (lbs per ac): N _____ P_2O_5 _____ K_2O _____

[1] *Acres = Distance x Width / 43,560*

Unloading travel distance:

Desired Application Rate _____ x Spread Width _____ ft. Required Distance _____ Ft.

Nutrients Applied (lbs per ac): N _____ P_2O_5 _____ K_2O _____

Desired Application Rate _____ x Spread Width 0 ft. Required Distance _____ Ft.

Nutrients Applied (lbs per ac): N _____ P_2O_5 _____ K_2O _____

Desired Application Rate _____ x Spread Width 0 ft. Required Distance _____ Ft.

Nutrients Applied (lbs per ac): N _____ P_2O_5 _____ K_2O _____

Note: Adjust travel speed and/or spreader discharge rate if the calculated travel distance, at first, is not achieved.

Comments:

Section P: Instruction to Calculate Manure Application Rates

Nutrient Management Planning Tool
Spreadsheet Instructions

Introduction

This "Nutrient Management Plan" consists of multiple spreadsheets designed to determine and document the necessary land base (acres) required to safely land apply manure generated by a livestock operation. The spreadsheets are made up of the following pages: **SD-CPA-63A** – Total Nitrogen and Phosphorus Produced from Livestock Feeding Operation(s) **SD-CPA-63B** – Part 1 – Field Information; Part 2 – Estimated Nutrient Requirement; Part 3 – Planned Nutrient Requirements; Part 4 – Nutrient Application

Summaries to document manure application can be printed from the main menu or from the heading in column 37. There is a summary for DENR permitted facilities or an agonomic summary for non-permitted facilities.

There are pop-up windows available to assist in calibrating equipment (main menu and in heading of column 37), and calculating commercial fertilizer blends (heading of column 38).

Where to Start

Begin the nutrient planning process by first collecting a set of aerial plan maps of land available for manure application. On these maps, outline the fields that are suitable to safely land apply manure. This is an important step to an orderly assembly of field information needed to make entries on the spreadsheets. For instructions on how to develop plan maps and other documents needed in the nutrient management plan, refer to the "Supporting Documents" section found on page 5 below.

Spreadsheet Capacity

SD-CPA-63B is designed with a capacity to enter land base information for up to 126 fields. Initially, 27 lines will appear on the spreadsheet to enter field information. If more lines are needed, the spreadsheet capacity can be increased in 33 line increments by pressing the "Add Fields" button located at the bottom of worksheet.

Instructions

Complete the following in the main menu screen:

1. **Operator:** Enter the facility or land operator name.
2. **County:** Enter the county where the feeding operation is located.
3. **Prepared By:** Enter the name of the person completing the nutrient management plan spreadsheets.
4. **Date:** Enter the date the plan was prepared.
4. **Crop Year:** Enter the year of the 1st growing season.

Click on the grey box to go to the corresponding section within this plan.

SD-CPA-63A - Total Nitrogen and Phosphorus Produced from Operation (Columns 5-16)

Note: This spreadsheet must be filled out to allow proper functioning of Spreadsheet 63B.

5. **Type of Animals:** Enter the type of animal confined at the facility.
6. **No. of animals:** Enter number of animals confined at the facility (those confined for a total of 45 days or more in a 12 month period).

7. **Avg. weight:** Enter the average weight of the animals.
8. **Days of Confinement:** Enter the maximum number of days that the animals will be confined per year.
9. **N and P_2O_5 Total:** An estimated total pounds of nitrogen and phosphorus will be automatically calculated after the number of days of confinement has been entered. Both the organic and inorganic forms of nitrogen are considered in arriving at the initial pounds of nitrogen.
10. **Percent N retained during handling / storage:** Select from the drop down list the type of manure handling that best represents the facility. The % Nitrogen (N) retained will be automatically calculated and appear to the right of the entry. *Press the "System Description" tab at the bottom of screen for a description of handling/storage systems.*
11. **Total N available for application:** The total pounds of nitrogen available for application will be calculated after the manure storage option has been entered.
12. **Time of application:** Choose the time of application from the drop down list that represents your manure application practices.
13. **N Retained – Application method and % retained after application:** Select from the drop down list the appropriate application option. The % Nitrogen (N) retained will be calculated after the manure application option has been entered.
14. **Total N retained in field:** This value will be automatically calculated.
15. **3-Yr. Mineralization Rate:** The rate is based on type of manure handling. Choose from the drop down list the option that most closely represents the handling method that is or will be used. The estimated % inorganic Nitrogen (N) available over a 3 year mineralization period will appear to the right of the entry.
16. **N and P_2O_5 Available for the Crop:** The total pounds of Nitrogen (N) and Phosphorus (P_2O_5) available for crops will be automatically calculated. Cumulative totals will be shown on the lower right corner of this spreadsheet, and also carried over to the bottom of Spreadsheet 63B.

SD-CPA-63B (Part 1) – Field Information (Columns 17-28):

17. **Field ID:** Enter the field identification number or name (from plan map).
18. **Date Entered in Plan:** Enter the date that the field was added to the Nutrient Management Plan.
19. **Beginning acres in field:** Enter the total number of acres within the boundaries of the field, including all setback and/or exclusion areas.
20. **County:** Enter the county where the field is located.
21. **Soil Map Unit:** Enter the most predominant soil map unit symbol for the field (from plan map).
22. **Field Location:** Enter the legal description of each field to the nearest quarter/half section of land.
23. **Predicted Soil Loss using RUSLE:** Enter the calculated estimated water erosion (soil loss) figure, which is expressed in tons/ac/yr. This number is derived from an erosion prediction program called the Revised Universal Soil Loss Equation (RUSLE2). Use NRCS Form SD-CPA-29 to document calculations. Information about this computer program is available at the local Natural Resources Conservation Service (NRCS) office.
24. **Control of Land:** If the field is owned or leased by the livestock Operator, check the box. If the field is neither owned or leased, leave blank.

25. **Acres Excluded from Manure Application:** These 2 columns address the acres that will be excluded from manure application to minimize the risk of potential nutrients or pollutants from leaving the fields and reaching surface waters. From a field assessment, indicate if a 100 foot vegetated "buffer" or "setback" is needed along all drainage ways or other water bodies in the field. Record the number of acres to be excluded, also consider all of the following "Drainages", "Wetlands", "Wells", "Slope" or any "Other" exclusions. (Determine and measure acres from the plan map).
26. **Irrigated:** Place a check in the box if the field is irrigated.
27. **No-till:** Check this box if the tillage/planting system that the land operator plans to use is a no-till, ridge-till or strip-till planting system.
28. **Current Soil Test:** Enter the appropriate N, P and K test results from the land operator's current soil test report from the lab. The value for N is reported in lbs/ac for a normal 0-2 foot sample. If a deeper 2-4 foot sample was collected and tested, enter the test results in the worksheet column labeled as "2-4 foot". The nitrate nitrogen in the 2-4 foot sample is automatically adjusted based on the test results. (Refer to the SDSU EC 750 "Fertilizer Recommendations Guide" (Page 4) for additional information). Reminder: Sampling and testing for N and P is required prior to manure application but only P is required for initial planning purposes.
    Next, select the type of phosphorus extraction method used at the testing lab (shown on the lab report). Enter the potassium from the lab results. Enter the date that the soil sample was collected.

    This spreadsheet can be sorted by clicking on the heading in columns 17 through 23.

SD-CPA-63B (Part 2) – Estimated Nutrient Requirement (Columns 29-31):

29. **Crops and Average Yield in Rotation:** Enter crops from the drop down lists. First, enter the crop grown the year prior to writing the NMP or manure application. Then enter the projected crops to be grown in the next two years. Using the 3 buttons in the top header of these columns crop yields can automatically be calculated based on one of three methods: (1) South Dakota Agricultural Statistics Service (SDASS) county five-year average yield indexed by the predominant soil type productivity index (PI), (2) South Dakota Agricultural Statistics Service publication current five-year county average yields. *Note:* **Both these yields are already *increased by 10 percent***. These yields can be over-ridden by entering a number in the yellow box to the right (Actual Yield column). (3) By choosing "Actual or Yield Goal" you can manually enter a yield for each crop. Enter actual or expected yields if either of the previous methods do not accurately reflect field conditions. Proof of field-by-field or farm-by-farm yields shall be based on an average of actual crop receipts from a minimum of three consecutive years. If there is no yield information available for a crop listed in the nutrient management plan, documentation from
30. **Initial Nutrient Mgt. Plan - N based field Acres:** This column automatically calculates acres, but for nitrogen based fields only. Any fields identified as "Phosphorus Crop Removal" may be used for manure application, however, they are not used on the spreadsheet to meet land base requirements. Fields with "No Application" acres will not be used to meet land based requirements.
31. **Nutrient Recommendations**: The computer program automatically makes plant nutrient recommendations (lbs/ac) based on the SDSU EC 750 "Fertilizer Recommendations Guide".

At the bottom of column 31 is a summary of "Total lbs of N and P2O5 available for the crops" (nutrients in manure - from CPA-63A), and "Total lbs of N and P2O5 required by fields". There is also a statment in red indicating if there is adequate acres available based on the Nitrogen analysis and if there is a phophorus increase anticipated in the fields. If there is a phosphorus buildup expected, an approximate number of years will be given until all the available acres are at 50 ppm olson or 75 ppm bray1, this is usually when the field is in the phosphorus based catagory. see N-P table in main menu
This is the end of what is considered the Initial Plan and can be printed by clicking the Print button at the top of the spreadsheet, (remember to print CPA-63A). Complete the remaining part of the spreadsheet when manure application in taking place.

SD-CPA-63B (Part 3) – Planned Nutrient Application (Columns 32-36):

32. **Manure application based on:** A field is generally considered **Nitrogen based** when the P soil test level is below 50 ppm Olsen or 75 ppm Bray; generally **Phosphorus Crop Removal** *(phosphorus based)* if above these levels. When a field is designated as Phosphorus Crop Removal, manure may still be applied according to nitrogen crop needs; however, the amount of phosphorus applied must be used by the crop or future crops in the rotation before more phosphorus is applied. *See column 40 to know how many years until the P2O5 is used and the field is available for more manure applications.* A "No Application" appears in this column when the P soil test level for a field is greater than 100 ppm Olsen or 150 ppm Bray (which exceeds the limits set in South Dakota), or if the Predicted Soil Loss (column 23) exceeds 6 tons/ac/yr. *See N-P table in main menu.*
33. **Manure Application and Incorporation**: Select the type of manure planned (Liquid or Solid) and the method of manure application. This will determine a nitrogen mineralization rate.
34. **Manure Test**: Using the lbs/ton or lbs/1000 gal. enter the total nitrogen, inorganic nitrogen (ammonium N), total P2O5 and total K2O test results from the manure analysis report. A number must be entered in all four columns. Reminder: Check and ensure that the P2O5 and K2O test results are used, not elemental P and K.
35. **Available N (first crop year)**: The computer program automatically makes a determination of available nitrogen. Includes Inorganic Nitrogen Retained and Organic Nitrogen.
36. **Maximum Manure Application**: The computer program automatically makes a manure application rate determination that reflects the **nitrogen recommendation** for the planned crop. At that rate the amount of manure required to evenly apply to all the available acres in the field will be given in the "Quantity of Manure" column.

SD-CPA-63B (Part 4) – Nutrient Application (Columns 36-35):

37. **Acres of Actual Manure Application**: Enter the actual amount of acres that manure was applied.

38. **Manure Application:** Enter the actual amount of manure that the operator applied (tons/ac or gallons/ac), date of application and time of day (This is a matter of record to help support the timeframe of the manure haul - required for State Permitted Facilities). At the top of this column are three buttons: "DENR Summary" and "Agronomic Summary" summarizes nutrient application by field, print these out on an annual basis to document manure application (rather than the entire form); "Manure Rate Calculator" is a pop-up worksheet that is designed to assist in calculating actual manure application rates, speeds, and distances.

39. **Nutrients Applied:** Enter the amount of nutrients applied using commercial fertilizer. To assist in the calculation of actual nutrient applied, press the "Commercial Application" for a pop-up form. To calculate an estimated value of manure applied, press the "Commercial Prices" button to update current commercial fertilizer prices. The estimated value of manure applied is calculated on the "Agronomic Summary" worksheet. The amount of available nutrients applied from manure will be calculated and displayed in the middle 3 columns and the total of manure plus commercial fertilizer will display in the end 3 columns.

40. **Estimated time to raise P soil test level to 50 ppm Olsen or 75 ppm Bray:** This is the estimated time for the crop or future crops in the rotation to use up the phosphorus applied during a nitrogen based application.

List of summary statements that may appear to reflect adequacy of acres:

Nitrogen based statements –

- "Adequate acres are available based on Nitrogen analysis". *This means the plan meets the Nitrogen based requirements.*
- "Inadequate acres are available based on Nitrogen analysis". *This means that additional land must be added to the plan to utilize the manure nitrogen produced by the livestock operation.*

Phosphorus Crop Removal (phosphorus based) statements –

- "Phosphorus (P_2O_5) removal exceeds or is in balance with crop needs". *This means the plan meets the Phosphorus based requirements.*
- "P_2O_5 is in excess of removal. At this rate, it will take approximately _____ years to build all listed fields up to 50 ppm P (Olsen)". *This means the plan meets the Phosphorus based requirements. Note: A low single digit number is evidence that the operation has adequate acres only for the short term – adding and using more land for manure application now is recommended as a means to slow phosphorus buildup.*
- "Inadequate acres are available based on Phosphorus analysis". *This means that additional land must be added to the plan to utilize the manure phosphorus produced by the livestock operation.*

Supporting Documents –

The following documents must be included with the Initial Nutrient Management Plan spreadsheets:

a. Copies of aerial photo plan maps that identify fields selected for manure application. Outline each field with a bold line boundary and label each with the following: (if possible, use ArcGIS or similar software to develop maps)

- Field ID (Example: Field 1)
- Acres (Example: 80 acres)
- Land use (Example: Cropland)
- Predominant soil map unit symbol (from soil survey map) (Example: Soil CaB)

The field ID may be a simple sequential numbering system, favorite field name or FSA Tract and field number.

The top of each map should be labeled **"Water Quality Risk Assessment Map"** along with the legal description (Section, Township, Range).

Locate and clearly outline (preferably cross-hatch) exclusion areas, setbacks or buffer areas around sensitive areas in fields or landscapes where manure will not be applied. If specific state and local compliance requirements are not known, contact the South Dakota DENR or local NRCS/Conservation District office for information.

Identify and mark the location of the headquarters, feedlots and water wells.

Make field risk assessments by analyzing surface water and aquifer resource information. Label fields that have a high vulnerability for nitrate leaching to an aquifer and/or phosphorus loss to surface waters. (Example: L = High leaching risk; R = High runoff risk). For guidance on how to make assessments, contact the South Dakota DENR or local NRCS/Conservation District office.

b. NRCS soil survey maps of all the fields in the plan, along with a soil map unit legend. Mark each map with a legal description.

c. If applicable, include a copy of signed manure application lease agreements executed with the land owner for fields not owned by the livestock operator. The written agreements will include, at a minimum, the legal description of individual fields, acres available for manure application, and time period (length in years) of the agreement. Agreements must be for at least one year.

d. Copies of current soil test reports (showing phosphorus test results) for all fields in the plan. *(Reminder: the proper sampling depth for a phosphorus test is the top 0-6 inches of soil).*

e. Copies of calculations showing the predicted water erosion (soil loss) using the Revised Universal Soil Loss Equation (RUSLE2). Document the calculations on NRCS Form SD-CPA-29. For information on how to do RUSLE2 calculations, contact the Natural Resources Conservation Service (NRCS).

Additional Information –

For additional information on Manure and Nutrient Management or links to other websites, visit the South Dakota NRCS website at:

http://www.sd.nrcs.usda.gov/technical/Nutrient_Management.html

Section Q: Manure Test Records

DAIRYLAND
Laboratories, Inc.

Dairyland Laboratories, Inc.
217 E. Main St.
Arcadia, WI 54612
Telephone: 608-323-2123
Fax: 608-323-2184
Email: info@dairylandlabs.com

Report Date: 9/16/2020
Sample No.: 001-2009-003365

To: Wulf Cattle Depot
26583 109th Street
McLaughlin, SD 57642

Account No.: 1002 (18)
Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT

Product: #1

MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID
SAMPLE NAME: #1
MATERIAL: Beef
STORAGE SYSTEM: Solid

ACTUAL ANALYSIS

MOISTURE:	26.15%
SOLIDS:	73.85%
NITROGEN:	0.93%
AMMONIA NITROGEN:	0.06%
PHOSPHORUS:	0.58%
POTASSIUM:	1.20%

	Total Nutrients	Estimated 1st year Available Nutrients		
		Time to incorporation		
		>72 hours or not incorporated	1 to 72 hours	<1 hour or injected
	lbs/ton		lbs/ton	
NITROGEN	18.60	4.65	5.58	6.51
PHOSPHATE	26.60	21.28	21.28	21.28
POTASH	28.80	23.04	23.04	23.04
AMMONIA NITROGEN	1.20			
TOTAL VALUE		$16.99	$17.32	$17.64

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.
Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea)	0.35/lb
P2O5 (Triple Superphosphate)	0.43/lb
K2O (Potash)	0.27/lb
S (Elemental Sulfur)	0.40/lb

Billing Information

Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT
Product: #1

Reference: 0757012
Date: 9/16/2020
Sample No.: 001-2009-003365

DAIRYLAND
Laboratories, Inc.

Dairyland Laboratories, Inc.
217 E. Main St.
Arcadia, WI 54612
Telephone: 608-323-2123
Fax: 608-323-2184
Email: info@dairylandlabs.com

Report Date: 9/16/2020
Sample No.: 001-2009-003366

To: Wulf Cattle Depot
26583 109th Street
McLaughlin, SD 57642

Account No.: 1002 (18)
Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT

Product: #2

MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID
SAMPLE NAME: #2
MATERIAL: Beef
STORAGE SYSTEM: Solid

ACTUAL ANALYSIS

MOISTURE:	15.90%
SOLIDS:	84.10%
NITROGEN:	1.11%
AMMONIA NITROGEN:	0.10%
PHOSPHORUS:	0.66%
POTASSIUM:	1.59%

	Total Nutrients	Estimated 1st year Available Nutrients		
		Time to incorporation		
		>72 hours or not incorporated	1 to 72 hours	<1 hour or injected
	lbs/ton		lbs/ton	
NITROGEN	22.20	5.55	6.66	7.77
PHOSPHATE	30.20	24.16	24.16	24.16
POTASH	38.20	30.56	30.56	30.56
AMMONIA NITROGEN	2.00			
TOTAL VALUE		$20.57	$20.96	$21.34

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.
Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea)	0.35/lb
P2O5 (Triple Superphosphate)	0.43/lb
K2O (Potash)	0.27/lb
S (Elemental Sulfur)	0.40/lb

Billing Information

Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT
Product: #2

Reference: 0757013
Date: 9/16/2020
Sample No.: 001-2009-003366

DAIRYLAND
Laboratories, Inc.

Dairyland Laboratories, Inc.
217 E. Main St.
Arcadia, WI 54612
Telephone: 608-323-2123
Fax: 608-323-2184
Email: info@dairylandlabs.com

Report Date: 9/16/2020
Sample No.: 001-2009-003367

To: Wulf Cattle Depot
26583 109th Street
McLaughlin, SD 57642

Account No.: 1002 (18)
Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT

Product: #3

MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID
SAMPLE NAME: #3
MATERIAL: Beef
STORAGE SYSTEM: Liquid

ACTUAL ANALYSIS

MOISTURE:	99.81%
SOLIDS:	0.19%
NITROGEN:	0.01%
AMMONIA NITROGEN:	0.01%
PHOSPHORUS:	0.01%
POTASSIUM:	0.04%

	Total Nutrients	Estimated 1st year Available Nutrients		
		Time to incorporation		
		>72 hours or not incorporated	1 to 72 hours	<1 hour or injected
	lbs/1000 gal		lbs/1000 gal	
NITROGEN	0.83	0.25	0.33	0.42
PHOSPHATE	1.90	1.52	1.52	1.52
POTASH	3.98	3.19	3.19	3.19
AMMONIA NITROGEN	0.42			
TOTAL VALUE		$1.59	$1.62	$1.65

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.
Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea)	0.35/lb
P2O5 (Triple Superphosphate)	0.43/lb
K2O (Potash)	0.27/lb
S (Elemental Sulfur)	0.40/lb

Billing Information

Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT
Product: #3

Reference: 0757014
Date: 9/16/2020
Sample No.: 001-2009-003367

DAIRYLAND
Laboratories, Inc.

Dairyland Laboratories, Inc.
217 E. Main St.
Arcadia, WI 54612
Telephone: 608-323-2123
Fax: 608-323-2184
Email: info@dairylandlabs.com

Report Date: 9/16/2020
Sample No.: 001-2009-003368

To: Wulf Cattle Depot
26583 109th Street
McLaughlin, SD 57642

Account No.: 1002 (18)
Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT

Product: #4

MANURE ANALYSIS REPORT

ANALYSIS RESULTS

SAMPLE ID
SAMPLE NAME: #4
MATERIAL: Beef
STORAGE SYSTEM: Liquid

ACTUAL ANALYSIS

MOISTURE:	99.77%
SOLIDS:	0.23%
NITROGEN:	0.01%
AMMONIA NITROGEN:	0.01%
PHOSPHORUS:	0.01%
POTASSIUM:	0.04%

	Total Nutrients	Estimated 1st year Available Nutrients		
		Time to incorporation		
		>72 hours or not incorporated	1 to 72 hours	<1 hour or injected
	lbs/1000 gal		lbs/1000 gal	
NITROGEN	0.83	0.25	0.33	0.42
PHOSPHATE	1.90	1.52	1.52	1.52
POTASH	3.98	3.19	3.19	3.19
AMMONIA NITROGEN	0.43			
TOTAL VALUE		$1.59	$1.62	$1.65

COMMENTS

Application of manure on the same field for 2 consecutive years increases availability of N, P, K, and S by 10%, and for 3 or more consecutive years by 15%.
Availability of N changes depending on application technique. Injection or incorporation within 3 days of application results in higher N availability.
Value based on commercial fertilizer costs as of 7/27/2020.

N (Urea)	0.35/lb
P2O5 (Triple Superphosphate)	0.43/lb
K2O (Potash)	0.27/lb
S (Elemental Sulfur)	0.40/lb

Billing Information

Sampled By: Wulf Cattle Depot
Sampled For: WULF CATTLE DEPOT
Product: #4

Reference: 0757015
Date: 9/16/2020
Sample No.: 001-2009-003368

Section R: Facility Maps

NOTE: PLEASE NOTE
CONTOURS AND DRAINAGE
ARROWS FOR DRAINAGE,
INCLUDING CLEANWATER

DIVERSION 3A-1

CLEANWATER ROAD

CHEMICAL STORAGE LOCATION

APPROXIMATE SECTION CORNER

CLEANWATER ROAD

TBM3

FEED STORAGE AREA

1 2 3 4 5 6

SCALE

TBM4

200 301 300 401 400

202 303 302 403 402

TURN-A-ROUND

TBM2

S1 S2 S3

DIVERSION 3B

305 304 405 404

SALE BARN

SETTLING BASIN 3D

TBM1

12 10

WORKING PENS

14 7

SETTLING BASIN 2A

306 407

SALE BARN PENS

307 406

11 8 9

HOLDING POND 3

TBM6 TBM5

101 103 105 107 109 111

SETTLING BASIN 2A

HOLDING POND 2

100 102 104 106 108 110 112

SETTLING BASIN 4B

HOLDING POND 4

SETTLING BASIN 4A

SETTLING BASIN 1A

HOLDING POND 1

BENCHMARKS ½" REBAR (TBM)				
TBM #	NORTHING	EASTING	ELEVATION	LOCATION
1	5,000.00	5,000.00	1,997.15	FENCE LINE
2	5,258.47	5,000.00	1,997.3	FENCE LINE
3	5,879.09	2,832.63	1,997.97	FENCE CORNER
4	5,550.66	2,761.47	1,999.50	POWER POLE
5	4,383.62	3,103.12	1,984.22	POWER POLE
6	4,410.06	2,881.59	1,984.80	POWER POLE

GENERAL NOTES

LEGEND

- BENCHMARK
- BUILDINGS
- FENCELINE
- CULVERT/PIPE
- DRAINAGE ARROW

SCALE, FEET

0 175 350 525 700

DeHoan, Grabs & Associates, LLC
Registration Number: C-1341

No.	Revision/Issue	Date

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

WULF CATTLE DEPOT

N 1/2, SECTION 5, T 21 N, R 27 E
CORSON COUNTY, SD

FEEDLOT SITE MAP

DATE: APR 8, 2011	SHEET: R.1.
SCALE: 1" = 350'	
DRAWN BY: CAS	
CHECKED BY: DLD	

FILE NAME: SD PROJECT FILES/BEEF/CORSON/CFILES/PLAN

APPROXIMATE BURIAL LOCATION OF DEADS

McLAUGHLIN
POP. 775

SITE LOCATION

BUR.

NOR.

12

9.9

GENERAL NOTES

SCALE, FEET

0 2500 5000 7500 10000

DeHaan, Grabs & Associates, LLC
Registration Number: C-1341

No.	Revision/Issue	Date

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

WULF CATTLE DEPOT BURIAL LOCATION

N 1/2, SECTION 5, T 21 N, R 27 E
CORSON COUNTY, SD

COUNTY LOCATION MAP

DATE: OCT 6, 2009	SHEET: R. 2.
SCALE: 1" = 5000'	
DRAWN BY: SLI	
CHECKED BY: NAP	

FILE NAME: SD PROJECT FILES/BEEF/CORSON/CFILES/MAPS

Cremator Location

DGA CONSULTING ENGINEERS
4200 21ST ST. SE UNIT 101 MANDAN ND 58554

Maps Provided By:
surety® CUSTOMIZED ONLINE MAPPING
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Field borders provided by Farm Service Agency as of 5/21/2008.

Map Center: 45° 49' 4.94, -100° 47' 23.35

0ft 641ft 1282ft

4-21N-27E
Corson County
South Dakota

N W E S

9/25/2020

Section S: Engineering Calculations for Storage Considerations

S. Facility Design Calculations

A. Rainfall, Runoff & Facility Information

1. Rainfall Data
   a. Annual Rainfall = 17.4 inches
   b. Annual Runoff = 15.7% of Annual Rainfall for CN 90
   c. 25 Yr 24 Hr Storm Rainfall = 3.9 inches
   d. Annual Lake Evaporation = 35.3 inches

2. Measured Areas

Drainage Area - Pens	108.0	Acres
Drainage Area – Farmstead/Roads	45.3	Acres
Total Drainage Area	153.3	Acres
Holding Pond Surface Area at Top of FB	375,222	Sq. Ft.

3. Drainage Area Average Curve Number

Drainage Area Designation	Curve Number
Pens (DA-P)	90
Farmstead, Roads (DA-FR)	79

Hydrologic Soil Group B was used for all Drainage areas and was based off of the USDA Soil Survey. The fair Hydrologic Condition of the soil was used as a conservative assumption.

Average CN is equal to the sum of the products of each of the CN designation areas and their respective CN's divided by the total drainage area.

(	DA-P	x	CN-P	+	DA-FW	x	CN-FR	)	/	DA-Total	=	**Average CN**
(	108	x	90	+	45.3	x	79	)	/	153.3	=	**87**

4. Runoff Calculations
   a. Annual Runoff
   To estimate annual runoff from a curve number of 87, a conservative approach was used as a curve number 90 was used. Therefore 0.157 x 17.4" the runoff for this site is.

2.7	Inches

   b. 25 Yr 24 Hr Storm Runoff for a CN 87 (Soil Conservation method) =

2.5	Inches

B. Holding Pond Storage Components

1. 25 Yr 24 Hr Storm Runoff Volume

Storm Runoff Volume (SRV) = Drainage Area (DA) x 25 Yr 24 Hr Storm Runoff (SR)

DA (ac)	x	SR (in)	x	Units Conversion	=	SRV (ft^3)
153.3	x	2.5	x	3,630	=	1,391,198

2. Annual Runoff Volume

Annual Runoff Volume (ARV) = Drainage Area (DA) x Annual Runoff (AR)

DA (ac)	x	AR (in)	x	Units Conversion	=	ARV (ft^3)
153.3	x	2.7	x	3,630	=	1,502,493

3. 25 Yr 24 Hr Rainfall on Pond Surface

25 Yr 24 Hr Rainfall on Pond Surface Volume (SRNV) = Holding Pond Surface Area at Top of Berm (PSA) x 25 Yr 24 Hr Storm Rainfall (SRN)

PSA (ft^2)	x	SRN (in)	x	Units Conversion	=	SRNV (ft^3)
375,222	x	3.9	x	0.0833	=	121,898

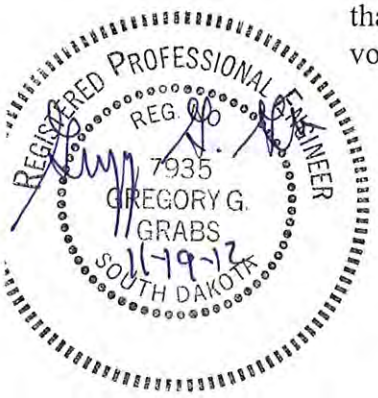
4. Annual Rainfall on Pond Surface

Annual Rainfall on Pond Surface Volume (ARNV) = Holding Pond Surface Area at Top of Berm (PSA) x Annual Rainfall (ARN)

PSA (ft^2)	x	ARN (in)	x	Units Conversion	=	ARNV (ft^3)
375,222	x	17.4	x	0.0833	=	543,854

5. Estimated Annual Evaporation from Pond Surface

The estimated annual evaporation from the pond surface is calculated by multiplying the mean annual lake evaporation by the average evaporation area of the pond. The average evaporation area is the surface area of the pond at the elevation which provides storage that is halfway between the maximum operating volume and the residual water and solids volume.



a. Maximum Operating Elevation = The elevation at which storage equaling Freeboard Storage Volume (Includes Basins Storage-Solids)(FV) minus the 25 Yr 24 Hr Storm Runoff Volume (SRV) minus the 25 Yr 24 Hr Rainfall on Pond Surface Volume (SRNV) is met.

FV (ft^3)	-	SRV (ft^3)	-	SRNV (ft^3)	=	Storage (ft^3)	Maximum Operating Elevation
3,205,498	-	1,391,198	-	121,898	=	1,692,402	1,981.5

b. Average Evaporation Area = Area at the elevation which provides the average storage volume calculated as follows: (Maximum Operating El.

Volume + Residual Water and Solids El. Volume) / 2

(Max Operating El. Volume	+	Residual El. Volume)	/ 2 =	Average Evaporation El. Volume	Average Evaporation Area (ft^2)
(1,199,371	+	115,956)	/ 2 =	848,975	219,917

c. Annual Evaporation Volume (AEV) = Average Evaporation Area (AEA) x Annual Lake Evaporation (AE)

AEA (ft^2)	x	AE (in)	x	Units Conversion	=	AEV (ft^3)
219,917	x	33.7	x	0.0833	=	617,353

C. Holding Pond Storage Requirement

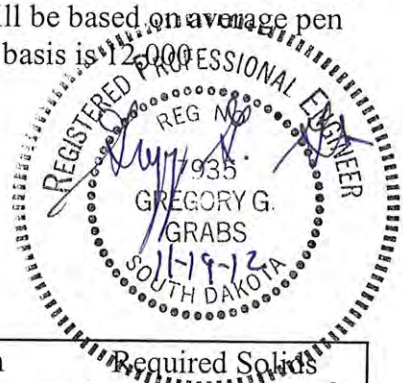
Required Storage = Annual Runoff Volume (ARV) + 25 Yr 24 Hr Storm Runoff Volume (SRV) + Annual Rainfall on Pond Surface Volume (ARNV) + 25 Yr 24 Hr Storm Rainfall on Pond Surface Volume (SRNV) - Annual Evaporation Volume (AEV)

ARV (ft^3)	+	SRV (ft^3)	+	ARNV (ft^3)	+	SRNV (ft^3)	-	AEV (ft^3)	=	Required Storage (ft^3)
1,502,493	+	1,391,198	+	543,854	+	121,898	-	617,353	=	**2,942,090**

D. Sediment Basin Solids Storage Requirement

The minimum sediment basin solids storage volume allowed by the SD DENR is 0.6 yd^3 per head. Since actual cattle numbers above any one basin may vary a daily basis based on pen stocking rate, solids storage volume requirements will be based on average pen space per head. The maximum stocking basis on an annual basis is 12,000.

Total Pen Area	/	Total Head #	=	Average Pen Area per Head
4,704,217	/	12,000		392



1. Settling Basin 1A

Pen Area Drained (ft^2)	/	Average Pen Area / Head	x	0.6 yd^3 per head	x	Conversion Factor	=	Required Solids Storage Volume (ft^3)
522,375	/	392	x	0.6	x	27	=	21,588

2. Settling Basin 2A

Pen Area Drained (ft^2)	/	Average Pen Area / Head	x	0.6 yd^3 per head	x	Conversion Factor	=	Required Solids Storage Volume (ft^3)
1,879,238	/	392	x	0.6	x	27	=	77,662

3. Settling Basin 3A (since there are long diversions and long flow distances 0.4 will be used for the actual basin.

Pen Area Drained (ft^2)	/	Average Pen Area / Head	x	0.6 yd^3 per head	x	Conversion Factor	=	Required Solids Storage Volume (ft^3)
1,731,437	/	392	x	0.4	x	27	=	47,703

4. Settling Basin 4A

Pen Area Drained (ft^2)	/	Average Pen Area / Head	x	0.6 yd^3 per head	x	Conversion Factor	=	Required Solids Storage Volume (ft^3)
171,508	/	392	x	0.6	x	27	=	7,088

5. Settling Basin 4B

Pen Area Drained (ft^2)	/	Average Pen Area / Head	x	0.6 yd^3 per head	x	Conversion Factor	=	Required Solids Storage Volume (ft^3)
399,659	/	392	x	0.6	x	27	=	16,517