UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 500
DENVER, CO 80202-2466
http://www.epa.gov/region08

MAR 8 2000

Ref: 8P-W-GW

Darrell Cruea
Commissioner
South Dakota Department of Agriculture
523 East Capital Avenue
Pierre, South Dakota 57501-3182

Re: State Management Plan Concurrence

Dear Commissioner Cruea:

I am happy to inform you that the South Dakota Generic Pesticides and Ground Water State Management Plan meets all of the Environmental Protection Agency's criteria for plan concurrence. Accordingly, this letter formally transmits our concurrence of the plan.

We have encouraged States to use generic Pesticide and Ground Water State Management Plans as the basis for their pesticide specific Pesticide Management Plans. I believe this document will help you develop your Pesticide Management Plan.

We recognize the time and effort that were put into developing this generic Pesticides and Ground Water State Management Plan and we appreciate your excellent work. We would like to particularly recognize Bruce Jacobson and Brad Bervan. Their efforts demonstrate that the new paradigm of partnerships can yield outstanding results. We look forward to continuing our collaboration as this plan is implemented.

Sincerely,

Wm Yellowtail

William P. Yellowtail
Regional Administrator

cc: Kevin Fridley, DoA
Brad Bervan, DoA
Bruce Jacobson, DoA
Bill Markley, DENR

State of South Dakota

Generic Pesticides and Ground Water State Management Plan

JANUARY 2000

South Dakota Department of Agriculture
South Dakota Department of Environment and Natural Resources
Pesticides and Ground Water Advisory Group

STATE OF SOUTH DAKOTA

GENERIC
PESTICIDES AND GROUND WATER
STATE MANAGEMENT PLAN

January 2000

prepared by
Bruce Jacobson, Agricultural Program Specialist
South Dakota Department of Agriculture

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LIST OF ACRONYMS

AES	Agricultural Experimental Station
AI	Active Ingredient
ARS	Agricultural Research Station
ARSD	Administrative Rules of South Dakota
BMP	Best Management Practice
CCA	Certified Crop Advisor
CEPA	Centennial Environmental Protection Act
CERCLA	Comprehensive Emergency Response, Compensation, and Recovery Act
CES	Cooperative Extension Service
CFR	Code of Federal Regulations
CWA	Clean Water Act
DENR	Department of Environment and Natural Resources
DOH	Department of Health
EDWDD	East Dakota Water Development District
EPA	Environmental Protection Agency
EPTC	S-Ethyl dipropylthiocarbamate
°F	Degrees Fahrenheit
FARM-A-SYST	Farmstead Assessment System
FFDCA	Federal Food, Drug, and Cosmetic Act
FIFRA	Federal Insecticide, Fungicide, Rodenticide Act
GFP	Game, Fish, and Parks
GIS	Geographic Information System
GSMP	Generic State Management Plan
GSP	Geological Survey Program
GUP	General Use Pesticide
GWQP	Ground Water Quality Program
HA	Health Advisory
ICM	Integrated Crop Management
in	Inches
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Program
Lbs	Pounds
MCL	Maximum Contaminant Level
MCPA	(4-chloro-2-methylphenoxy) acetic acid
µg/L	microgram per Liter
Mg/L	Milligrams per liter
MOU	Memorandum Of Understanding
MSDE	Minimum Set Of Data Elements
NA	Not Analyzed or Not Applicable
NCFAP	National Center For Food And Agricultural Policy
NGPWRC	Northern Great Plains Water Resources Center
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service (USDA)
PAGWAG	Pesticides And Ground Water Advisory Group
PIAP	Pesticide Impact Assessment Program
PPA	Performance Partnership Agreement (State of South Dakota and U.S. Environmental Protection Agency Multi-Year Agreement)
ppb	parts per billion

LIST OF ACRONYMS (continued)

ppm	parts per million
PSSMP	Pesticide Specific State Management Plan
PVC	Polyvinyl Chloride
PWS	Public Water System
RCRA	Resource Conservation And Recovery Act
RUP	Restricted Use Pesticide
SARA	Superfund Amendments And Reauthorization Act
SD	South Dakota
SDASS	South Dakota Agricultural Statistical Service
SDCL	South Dakota Codified Law
SDCLR	South Dakota Crop And Livestock Reporter
SDDA	South Dakota Department Of Agriculture
SDSU	South Dakota State University
SDWA	Safe Drinking Water Act
SMP	State Management Plan
TDS	Total Dissolved Solids
USC	United States Code
USDA	United States Department Of Agriculture
USFWS	United States Fish And Wildlife Service
USGS	United States Geological Survey
voc	volatile organic chemicals
WATSTORE	National Water Storage And Retrieval System
WRI	Water Resources Institute

ACKNOWLEDGMENTS

The South Dakota Department of Agriculture; Division of Agricultural Services wishes thank the numerous individuals and agencies that assisted in the development of this State Management Plan. Particular appreciation is extended to the:

Pesticides and Ground Water Advisory Group for Development of the Generic Pesticides and Ground Water State Management Plan:

Tom Brandner	South Dakota Department of Environment and Natural Resources, Environmental Services
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Jim Wilson	South Dakota State University/Cooperative Extension Service
Kathy Zander	South Dakota Fertilizer and Ag Chemical Association, Executive Secretary

US Environmental Protection Agency, Region VIII:

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Derric Iles	South Dakota Department of Environment and Natural Resources, Geological Survey Program
Bill Markley	South Dakota Department of Environment and Natural Resources, Environmental Services
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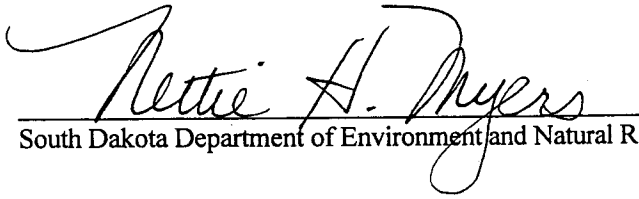
Dennis Shoup	US Department of Agriculture, Natural Resources Conservation Service
Jim Stukel	Natural Resources Consultant
Chuck Ullery	South Dakota State University
Anita Yan	South Dakota Department of Environment and Natural Resources, Environmental Services
Frank Chianelli	Previously with Pesticides Section - EPA

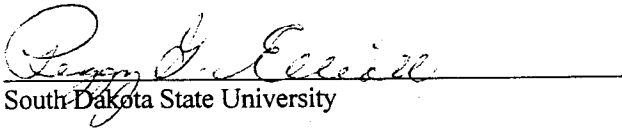
CONCURRENCE SIGNATURES

The following agency representatives have read the *South Dakota Generic State Management Plan for Pesticides and Ground Water* and concur with their agency's responsibilities, within statutory authority and budgetary limits, as stated in the plan.

South Dakota Department of Agriculture



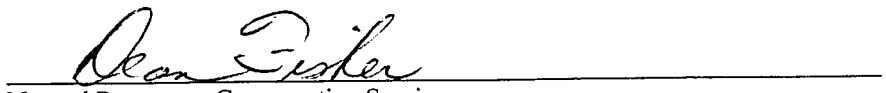
South Dakota Department of Environment and Natural Resources



South Dakota State University

CONCURRENCE SIGNATURES (Continued)

The following agency representative has read the *South Dakota Generic State Management Plan for Pesticides and Ground Water* and concurs with their agency's responsibilities, within statutory authority and budgetary limits, as stated in the plan.



Natural Resources Conservation Service

CONCURRENCE SIGNATURES (Continued)

The following agency representative has read the *South Dakota Generic State Management Plan for Pesticides and Ground Water* and concurs with their agency's responsibilities, within statutory authority and budgetary limits, as stated in the plan.

Janet M. Carter 10/26/98

United States Geological Survey

CONCURRENCE SIGNATURES (Continued)

The following agency representatives have read the *South Dakota Generic State Management Plan for Pesticides and Ground Water* and concur with their agency's responsibilities, within statutory authority and budgetary limits, as stated in the plan.

South Dakota Department of Health

KEVIN L. FORSCH, DIRECTOR
DIVISION HEALTH SYSTEMS DEV. & REGULATION

STATE LIAISON

The purpose of a state liaison is to have a single contact responsible for the transmittal and receipt of official correspondence and information. The single contact for all formal communications concerning the State Management Plan process between the U.S. Environmental Protection Agency and the State of South Dakota is:

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INTRODUCTION

The late George S. Mickelson (Governor 1986-1992) once remarked, "Agriculture has always been the core of what South Dakota is all about." Agriculture continues to be the state's number one industry and the cornerstone of South Dakota's economy. Over the years, pesticide use has become a valuable tool that farmers and ranchers rely on to manage pests that invade fields or rangeland. Equally important is prevention of ground water quality degradation. It is the foundation of the South Dakota plan. South Dakota statute §34A-2-104 in part states:

> "It is hereby declared to be the public policy of this state to conserve the ground water of the state and to protect, maintain and improve the quality thereof for present and future beneficial uses through the prevention of pollution, correction of groundwater pollution problems and close control of limited degradation perimeters permitted for necessary economic or social development."

Current water quality information shows that pesticides, when properly used, are not causing widespread ground water contamination in South Dakota. However, detections of pesticides in ground water on a national level (including detections in very limited aquifer areas of South Dakota), have led to a federal/state partnership in the development and implementation of State Management Plans (SMP) for Pesticides and Ground Water. In October of 1991, the U.S. Environmental Protection Agency (EPA) published its Pesticide and Ground Water Strategy. The document recognized that ground water is vitally important to the health of this country's citizens, the integrity of our ecosystems and the vigor of our economy. Since 1986, EPA has been documenting the problem of pesticides and other agricultural chemicals contaminating ground water and from that developed a framework to address the problem. The document outlines EPA's strategy for managing the use of pesticides, which pose a risk of contaminating the nation's ground water resources. This strategy will involve states and the federal government in a new partnership approach.

According to the strategy, when EPA determines that a pesticide presents a significant risk to human health and/or the environment, it may either cancel the pesticide or allow the state to develop and implement a Pesticide Specific State Management Plan (PSSMP). (In assessing the risks EPA took into account the economic, social, and environmental costs and benefits of pesticide use and published the data in a document entitled: Regulatory Impact Analysis of State Management Plans for Ground-Water Protection.) The PSSMP will describe how the state will manage the pesticide to protect the ground water. The EPA also encouraged states to develop a Generic State Management Plan (GSMP) (this document) outlining how the state will generally manage all pesticides to ensure ground water protection. This generic plan will focus on the agricultural use of SMP pesticides. Urban and other uses such as rights-of-way and forestry are included only when a SMP pesticide is registered for such use in South Dakota.

The EPA prepared and released a final guidance in December 1993 for preparation and review of SMPs. According to the guidance document, generic and pesticide specific SMPs include the following 12 components:

1) State's Philosophy and Goals Toward Protecting Ground Water;
2) Roles and Responsibilities of State Agencies;
3) Legal Authority;
4) Resources;
5) Basis for Assessment and Planning;
6) Monitoring;
7) Prevention Actions;
8) Response to Detections of Pesticides;
9) Enforcement Mechanisms;
10) Public Awareness and Participation;
11) Information Dissemination; and
12) Records and Reporting.

South Dakota's GSMP is organized in accordance with the EPA guidance documents. Components 5, 6, 7, and 8 of the SMP are considered extremely important if the plan is to achieve its goal of protecting, maintaining and improving ground water quality for present and future beneficial uses.

PURPOSE OF THE DOCUMENT

This document was developed in response to Environmental Protection Agency (EPA) requirements for developing Pesticides and Ground Water State Management Plans to protect ground water from pesticide contamination. This plan is a generic plan designed to lay the framework and set out a general process for a Pesticide Specific State Management Plan (PSSMP). The EPA will require states to develop PSSMPs for pesticides designated as ground water contamination threats. The generic plan will outline the process needed to develop the PSSMPs.

This Generic State Management Plan (GSMP) for South Dakota is intended to describe how programs and policies already in place will be used to address concerns related to pesticides and ground water quality. In addition it will describe how the South Dakota Department of Agriculture's authority to regulate pesticides may be used to augment these activities. The South Dakota GSMP provides the framework and basic concepts needed for the State to develop and implement a PSSMP.

COMPONENT ONE
STATE'S PHILOSOPHY AND GOALS TOWARD PROTECTING GROUND WATER

1.1 INTRODUCTION

South Dakota's ground water protection goal is to conserve ground water and to protect, maintain and improve ground water quality for present and future beneficial uses (refer to Box 1.1). The ground water protection goal was declared public policy by the 1989 Legislature when South Dakota Codified Law (SDCL) §34A-2-104 was adopted. This law meets the Environmental Protection Agency's (EPA) goal of "preventing adverse effects to human health and the environment and to protect the environmental integrity of the nation's ground water." Both EPA and South Dakota have a ground water protection goal encompassing the objectives of pollution prevention and remediation. Prevention is based on the relative vulnerability of the resource and its use and value. Remediation is based on the relative use and value of the ground water.

Box 1.1
Ground Water Protection Goal
Reference: SDCL §34A-2-104

"The Legislature finds that groundwater is a resource of immeasurable value to public health and welfare, critical for the provision of water supply needs for domestic, agricultural, industrial, mining, recreational and other beneficial uses of water, and that pollution of groundwater of this state from both point and nonpoint sources constitutes a menace to public health, welfare and the environment, and that there has been an increasing awareness on the part of the public, local governments and the state that groundwater must be protected, that once groundwater is polluted, it is extremely difficult and expensive to clean up, that both strong enforcement and public education are important and necessary components of the state strategy for minimizing and reducing potential pollution sources, and that effective preventive measures and swift response to releases of pollutants minimize ground water pollution. It is hereby declared to be the public policy of this state to conserve the groundwater of the state and to protect, maintain and improve the quality thereof for present and future beneficial uses through the prevention of pollution, correction of groundwater pollution problems and close control of limited degradation perimeters permitted for necessary economic or social development."

1.2 GROUND WATER PROTECTION GOAL

The South Dakota Ground Water Quality Standard classifies the beneficial use of ground water with a total dissolved solids (TDS) concentration of less than 10,000 milligrams per liter (mg/L) as drinking water. Ground water in South Dakota is protected for the beneficial use of drinking water, and the numerical standards adopted for South Dakota's ground water are generally the maximum contaminant levels (MCL) for drinking water. Chemicals that do not have a MCL or numerical ground water quality standard but could adversely impact public health or the environment are identified as "Potential Toxic Pollutants" and are to be non-detectable in ground water. When EPA adopts MCLs or acceptable health advisories for pesticides, those concentrations may be adopted as numerical standards by South Dakota's Pesticide Specific State Management Plans (PSSMP).

South Dakota Codified Law requires the Department of Environment and Natural Resources (DENR) to prioritize the pollution prevention and ground water protection efforts for the state. Prioritization is based on ground water quality standards, beneficial uses of water, the extent to which a ground water source supplies (or might feasibly supply) public water systems or wellhead protection areas, the degree of hazard to public health and welfare, the dependence of local citizens upon ground water supplies, and the vulnerability of ground water supplies to contamination. A majority of the aquifers in the state have been prioritized based on the above criteria. Aquifers receiving the highest priority are the sensitive aquifers that occur essentially at the land surface, have little to no overlying protective soils/sediments, and can be or are known to be hydraulically connected to surface water resources. The prioritization process is explained in more detail in Component 5 - Basis For Assessment and Planing, under Section 5.9 – Prioritization Of Aquifers In South Dakota, on page 5-8.

1.3 PESTICIDE USE GOAL

South Dakota's pesticide use goal is based on pollution prevention. Misuse, accidents, and normal use contributing to ground water pollution will be investigated, and a proper response plan will be chosen to ensure that pesticides do not impair the quality of South Dakota's environment (refer to Box 1.2).

Box 1.2
SDCL §38-21-15
Pollution Prohibited

No person may transport, store, use, dispose of or handle any pesticide, pesticide container, rinsate, or application equipment in such a manner as to endanger or cause injury to humans, vegetation, crops, livestock, wildlife, beneficial insects or to ***pollute ground water or surface water.*** (Emphasis added).

1.4 STATE MANAGEMENT PLAN GOAL

South Dakota's Generic State Management Plan (GSMP) for Pesticides and Ground Water, emphasizes pollution prevention, realizing remediation is necessary in some cases such as point source releases. South Dakota's State Management Plan (SMP) goal is to manage the use of pesticides to prevent adverse effects on human health and the environment and to protect the ground water quality of South Dakota aquifers for present and future beneficial uses. Aquifers that are most sensitive are given highest priority for pollution prevention and ground water protection.

Preventing pesticide contamination of ground water, monitoring for the occurrence of pesticides in ground water, and responding to ground water pollution by pesticides are necessary state actions. This plan combines the efforts of federal, state, and local agencies to maintain and/or improve ground water quality in the state. Along with protecting ground water quality, the SMP must also protect the state's agricultural productivity, profitability and future pesticide use. Promoting land stewardship will be key to the success of the SMP. The state recognizes the necessity of pesticide use in modern agronomic production and also recognizes that a safe source of drinking water is a necessity for the citizens of the state. The state has taken these factors into consideration in preparing the GSMP and will also consider these factors in the development of Pesticide Specific State Management Plans.

COMPONENT TWO
AGENCY ROLES AND RESPONSIBILITIES

2.1 INTRODUCTION

The State of South Dakota will continue to build on the resources and technical expertise necessary to adequately design and implement the South Dakota Generic and Pesticide Specific, State Management Plans (SMPs). Roles and responsibilities of those involved in the SMP process are discussed below.

Several agencies and organizations have the role of advising the South Dakota Department of Agriculture (SDDA) and the Department of Environment and Natural Resources (DENR) in SMP development and implementation (refer to Box 2.1). Specifically, advisors from the Natural Resources Conservation Service (NRCS), the Cooperative Extension Service (CES), South Dakota State University (SDSU), Registrants, the South Dakota Fertilizer and Ag Chemical Association, grower and producer groups, and water user groups will contribute to the success of the SMP.

Box 2.1
Statutory Authority For Pesticides and For Ground Water

The South Dakota Department of Agriculture and the Department of Environment and Natural Resources have the majority of SMP responsibilities as state agencies with statutory authority over pesticides and water resources, respectively.

The SDDA began the formal process of developing the Generic State Management Plan (GSMP) for Pesticides and Ground Water with the first SMP new initiatives grant from EPA. Soon after receiving the grant, SDDA and DENR began cooperatively drafting the initial generic document. The NRCS also contributed to the first draft through an employee on detail to DENR. Once the basic ideas were on paper, frequent meetings between SDDA, DENR, NRCS, CES, and SDSU, led to the current version of the SMP. The South Dakota Fertilizer and Ag Chemical Association and a pesticide registrant were added mid-way through the process. The SDDA established this group as the Pesticides and Ground Water Advisory Group (PAGWAG). They were charged with development of the Generic State Management Plan. New pesticide specific groups will be formed by SDDA for development of Pesticide Specific State Management Plans (PSSMPs). Revisions to the generic document included input from others in the pesticide production industry, water development districts, commodity groups, the Nonpoint Source Task Force, and the general public. A list of SMP stakeholders is found in Appendix A. The GSMP will be finalized and sent to EPA Region VIII for review and concurrence. After the GSMP is finalized pesticide specific SMP advisory groups will be formed by SDDA and Pesticide Specific State Management Plans (PSSMPs) will be developed similarly to the GSMP and submitted to EPA according to final SMP rule requirements. Final EPA concurrence of the GSMP and final approval of the PSSMPs will rest with the EPA, Region VIII Administrator.

The following agreements are in place to ensure implementation of the SMP will be carried out by each participating agency: the SMP Concurrence Signatures (see page xiv); the SDDA/DENR Memorandum of Understanding (MOU) (Appendix B); and the SDDA and SDSU Interagency Agreement of Pesticide Certification and Recertification (Appendix D). Concurrence Signatures indicate each agency involved in the SMP concurs with the plan and commits to carry out their agency's responsibilities as stated in the plan. This serves as the mechanism to formally commit respective work efforts to the Generic and Pesticide Specific State Management Plans, as allowed by statutory authority and budgetary limits.

2.2 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

The SDDA is directed by the legislature to promote, encourage and protect the interests of agriculture. It is SDDA's position that major issues facing agriculture and the environment, sustainable agriculture, integrated pest management, crop rotation, conservation and other sustainable practices are to be addressed with a vision for the future and the need to protect South Dakota's resources.

2.2.1 DIVISION OF AGRICULTURAL SERVICES

A. Active Pesticide Programs

The SDDA is responsible for registration of pesticide products, applicator certification and licensing, dealer licensing, waste pesticide collection, and pesticide container recycling (refer to Box 2.2). The SDDA is also responsible for SMP development and implementation, operational area containment compliance oversight, investigation of pesticide spills, pesticide handling and discharge response plan compliance oversight, potable water back flow protection compliance oversight, inspection of pesticide producers and retail outlets, investigation of pesticide use complaints, and ensuring proper transportation, storage and handling of pesticides. The SDDA also enforces and administers pesticide-related civil penalties. These areas of responsibility provide for ground water protection and pollution prevention activities. The SDDA has the authority to cancel, restrict or limit the use of a pesticide in South Dakota for reasons including, but not limited to, ground water concerns.

Box 2.2
Responsibilities Of The
South Dakota Department of Agriculture

- **Registration of Pesticides**
  8,000 plus Restricted Use Pesticides (RUP) and general use pesticides are registered in South Dakota and sold or used for agricultural or non-agricultural use;
- **Applicator Certification and Licensing**
  The SDDA certifies private applicators and certifies and licenses commercial applicators. Pesticide application records are required of all commercial applicators. Dealers keep records of all RUPs sold;
- **Waste Pesticide Collection**
  Unusable pesticides are collected and disposed of by SDDA through the Waste Pesticide Collection Program;
- **Pesticide Container Recycling**
  The SDDA Pesticide Container Recycling Project collects empty and properly rinsed pesticide containers for recycling;
- **SMP Development and Implementation**
  The SDDA regulates pesticides to protect human health and the environment, including ground water;
- **Operational Area Containment**
  The SDDA regulates spill-reporting requirements for Operational Area Containment. All discharges must be promptly recovered. The recovered material must be used in accordance with the label. A written pesticide handling and discharge response plan must be developed;
- **Pesticide Containment**
  Liquid pesticide secondary containment is regulated by SDDA. The containment must be large enough to contain discharges from the largest container.

B. Role in this Plan

Specific roles and responsibilities for SDDA in the development and implementation of the SMP are listed below. These activities are the primary responsibility of the Division of Agricultural Services, within SDDA.

- State lead agency and Governor-designated contact for EPA regarding the SMP;
- Oversee and cooperatively develop the SMP with DENR, other agencies and the public;
- Regulate pesticides through state statute and agency regulations and Federal Insecticide Fungicide and Rodenticide Act (FIFRA) regulations addressing:
  - ◊ registration and distribution
  - ◊ use
  - ◊ applicator certification and licensing
  - ◊ transportation
  - ◊ storing
  - ◊ disposal
  - ◊ handling
  - ◊ enforcement
- Cancel the use of a pesticide if necessary:
  - ◊ cancel the use on a site-specific basis
  - ◊ cancel the use state-wide
- Require pesticide information from:
  - ◊ applicators
  - ◊ dealers
  - ◊ chemical companies
  - ◊ federal and state agencies
  - ◊ agricultural and non-agricultural organizations
- Seek regulatory and statutory changes related to the SMP as necessary;
- Organize and chair all Pesticide and Ground Water Advisory Group meetings;
- Sponsor public meetings to gather comments on the SMP;
- Promote and help develop voluntary and/or mandatory Best Management Practices;
- Make presentations to various organizations to gather comments on the SMP;
- Provide information on the SMP to applicators, dealers, and the public;
- Respond to pesticide contamination problems, and
- Cooperate in the development of aquifer sensitivity and vulnerability maps.

2.3 SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Roles and responsibilities of DENR in the development and implementation of the SMP are listed below. These activities are primarily the responsibility of the Ground Water Quality Program (GWQP) and the Geological Survey Program (GSP) with other programs involved as noted.

2.3.1 DIVISION OF ENVIRONMENTAL SERVICES

Ground Water Quality Program
Drinking Water Program
Waste Management Program
Water Rights Program

And

DIVISION OF FINANCIAL AND TECHNICAL ASSISTANCE

Geological Survey Program
Watershed Protection Program

A. Active Ground Water Programs

The DENR has many active programs under the Division of Environmental Services and the Division of Financial and Technical Assistance that protect ground water (refer to Box 2.3).

B. Role in this Plan

- Cooperatively develop the SMP with SDDA, other agencies, and the public;
- Respond to and ensure corrective action of regulated substances discharges, including pesticides;
- Enforce ground water quality standards;
- Develop and implement statewide ground water quality monitoring network;
- Cooperate in the development of maps for sensitivity (related solely to hydrogeologic characteristics of the aquifer and the overlying geologic materials) and for vulnerability (as a result of agronomic management practices, pesticide characteristics and aquifer sensitivity);
- Maintain a pesticide in ground water data management system;
- Assist SDDA with public meetings to gather input on the SMP; and
- Assist SDDA with presentations to agencies and organizations to gather input on the SMP.

Box 2.3
Responsibilities Of The
South Dakota Department of Environment and Natural Resources

Wellhead Protection Program
- Develop a Source Water Assessment and Protection program;
- Provide wellhead protection program guidance. Includes technical assistance and information to public water suppliers;
- Wellhead protection programs and the SMP share the same water quality goals.

Statewide Ground Water Quality Monitoring Network
- Maintain the monitoring program for South Dakota.

Nonpoint Source Pollution Prevention
- Provide technical information and oversight of the implementation of Section 319 nonpoint source pollution control projects.

Regulated Substances Discharges
- Ensure discharges to the environment receive proper corrective action.

Ground Water Quality Standards
- Ensure ground water quality standards are met.

Other DENR efforts that are peripheral to but may contribute to SMP implementation:

- Administer the Superfund Amendments and Reauthorization Act (SARA) Title III;
- Administer the Comprehensive Emergency Response, Compensation and Recovery Act (CERCLA);
- Administer the Comprehensive State Ground Water Quality Protection Program;
- Administer the wellhead protection and source water protection programs;
- Administer Safe Drinking Water Act and state law;
- Adopt drinking water standards for the state's public water supplies;
- Manage water quality data and information on public water supplies;
- Engage in county and area-wide geologic and hydrogeologic studies and special ground water studies;
- Regulate the handling and disposal of solid and hazardous wastes;
- Administer the Resource Conservation and Recovery Act (RCRA);
- Collect and manage ground water data, including irrigation and chemigation use;
- Regulate drilling, construction, and plugging of water wells;
- Maintain a statewide water level observation network; and
- Administer the 319 Nonpoint Source Control Program.

2.4 PESTICICDES AND GROUND WATER ADVISORY GROUP

The PAGWAG currently consists of the following: SDDA, DENR, NRCS, the CES, SDSU, the South Dakota Fertilizer and Ag Chemical Association, and a registrant representative. The PAGWAG assisted in the development of the GSMP for South Dakota. A similar, but pesticide specific group will be formed to develop and implement PSSMPs.

Advisor responsibilities in the development and implementation of the SMP shall consist of:

- Provide recommendations regarding;
  - ◊ pesticide labeled use
  - ◊ pesticide use restrictions
  - ◊ pollution preventative actions
  - ◊ interpretation of site assessment information
  - ◊ data collection
  - ◊ pesticide leaching and runoff characteristics
  - ◊ management plan development for various aquifers, watersheds, and pesticide use
- Provide information to be used at pesticide applicator certification training;
- Inform pesticide applicators about Farmstead Assessment System or FARM-A-SYST, Best Management Practices (BMPs), and other pesticide and ground water protection measures;
- Develop or modify pest management standards, if necessary;
- Provide technical assistance to land owners under farm bill provisions;
- Assist in sensitivity and vulnerability mapping projects;
- Consider the economic costs associated with SMP management options;
- Review the extent, frequency, and significance of reported concentrations;
- Evaluate associated trends over time in relation to the Reference Point;
- Consider the scientific validity of the data; and
- Consider land use factors, which may be unique or unusual.

2.4.1 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE; DIVISION OF RESOURCE CONSERVATION AND FORESTRY

A. Active Programs

- State Conservation Commission, develops and implements the Coordinated Soil and Water Conservation Plan;
- Provide assistance and oversight to the state's sixty-nine conservation districts. Conservation districts provide direct assistance to individual land operators;
- Conservation districts are the only resource agencies covering the entire state. They have the authority to cooperate with all other resource agencies. SDDA "has the duty and the power to represent the state conservation districts and to develop and implement state policy for land conservation and development": and
- Provide wetland education and conflict resolution.

B. Role in this Plan

- Advisory Group Member

2.4.2 SOUTH DAKOTA BOARD OF REGENTS

South Dakota State University
South Dakota Agricultural Experiment Station
Cooperative Extension Service

A. Active Programs

- Student Teaching;
  - ◊ pesticides
  - ◊ agriculture
  - ◊ natural resources
  - ◊ home economics
  - ◊ ground water
  - ◊ surface water
  - ◊ soils
- Research; and
  - ◊ pesticides
    - * efficacy
    - * chemistry
    - * fate and transport
  - ◊ ground water and surface water
  - ◊ crops
  - ◊ BMP development and testing
  - ◊ soils
  - ◊ ecosystems

- Education.
  - ◊ integrated pest management
  - ◊ pesticide impact assessment
  - ◊ extension specialist programs
  - ◊ certification program

B. Role in this Plan

- Agricultural Experiment Station (AES);
  - ◊ fulfills the land grant research mission at SDSU
  - ◊ basic and applied agronomic research
  - ◊ cooperate with land grant universities in neighboring states
- Cooperative Extension Service; and
  - ◊ county offices
  - ◊ train and certify pesticide applicators
  - ◊ provide Extension Specialists
  - ◊ develop educational materials
  - ◊ develop state-wide programs for pesticides
  - ◊ provide water resource and soil survey information
  - ◊ implement the Pesticide Impact Assessment Program (PIAP)
  - ◊ implement the Integrated Pest Management Program (IPMP)
- South Dakota State University, Agricultural Research Station (ARS), Water Resources Institute (WRI), and Northern Great Plains Water Resources Center (NGPWRC).
  - ◊ provide research information in the following areas of expertise
    - * pesticides
    - * ground water
    - * surface water
    - * soils
    - * computer modeling

2.4.3 US DEPARTMENT OF AGRICULTURE; NATURAL RESOURCES CONSERVATION SERVICE

A. Active Programs

- Provides for the sound use and management of South Dakota's natural resources to prevent their degradation and assure their sustained use and productivity;
- Consider social, cultural and economic needs of landusers;
- Provide voluntary planning and application assistance to landusers in the sound implementation of conservation practices;
- Provide county soil surveys;
- Provide a pesticide management standard from the NRCS Technical Guide; and
- Provide wetland determinations for cropped areas.

B. Role in this Plan

- Continue work with state and federal agencies to develop SMP policy;
- Provide technology transfer and information dissemination to landowners;
- Soil and pesticide data will be shared; and
- Share data created and stored in Geographic Information Systems (GIS).

2.4.4 REGISTRANT

A. Active Programs

- Register and maintain registration of the product with SDDA;
- Pay authorization fees;
- Provide supporting product information, may include sales and use data; and
- Provide analytical methodologies and laboratory standards.

B. Role in this Plan

- Support an education and outreach program;
- Supply requested informational materials, including BMP suggestions, monitoring suggestions, and pesticide water quality assessment information;
- Supply requested ground water monitoring data results from studies in South Dakota and other states;
- Provide review on BMPs and other restrictions; and
- May be asked to propose a Pesticide Specific Management Plan.

2.4.5 SOUTH DAKOTA FERTILIZER AND AG CHEMICAL ASSOCIATION

The agricultural chemical dealer is a key player, and is essential for the SMP concept to work. The dealer may be one of the last influential contact points before an applicator prepares to make the pesticide application. The dealer has an opportunity to provide the last word in sound pesticide application practices to the producer.

A. Active Programs

- Provide applicator with pesticide active ingredient information;
- Hold meetings to update applicators on product use, storage, transportation and mixing; and
- May offer pesticide management services.

B. Role in this Plan

- Provide point of sale or pick-up use information, including Pesticide Specific Management Plan label;
- Provide information on ground water and pesticide management; and
- Supply applicator with local ground water information, including pesticide detections.

2.5 OTHER COOPERATORS - STATE

2.5.1 SOUTH DAKOTA DEPARTMENT OF HEALTH

A. Active Programs

The South Dakota Department of Health has services available to persons, businesses and communities in the following areas:

- Technical assistance is available to individuals and health care providers;
- Health and safety information is available to individuals, businesses, health care providers;
- Samples collected for chemical contamination testing may be submitted to state health laboratory;
- Community Health Nurses are in every county to assist individuals; and
- An on-staff epidemiologist is available.

B. Role in this Plan

- Emergency aid may be available when private well owners lose their drinking water supply during such disasters as flooding, and other well contamination events;
- Provide pesticide toxicological information; and
- Supply technical health and safety information.

2.5.2 SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

A. Active Programs

- Wetlands;
- Environmental enhancements; and
- Surface water issues.

B. Role in this Plan

- Provides biological information on impacted species and surface water issues.

2.5.3 LABORATORY

Only laboratories that are qualified and capable of performing analyses on water samples, soil samples, vegetation samples, and/or pesticide samples will be used.

A. Active Programs

- Laboratory Services.

B. Role in this Plan

- Provide laboratory services for SMP implementation.

2.6 OTHER COOPERATORS - FEDERAL

2.6.1 ENVIRONMENTAL PROTECTION AGENCY - PESTICIDE REGULATION

A. Active Programs

Several EPA programs are involved in protecting ground water, including:

- Federal Insecticide, Fungicide and Rodenticide Act, administered by the Toxics Program;
- Safe Drinking Water Act (SDWA), under the Water Program;
- Clean Water Act (CWA), administered by the Water Program;
- Resource Conservation and Recovery Act , under the Hazardous Waste Program; and
- Comprehensive Emergency Response, Compensation and Liability Act, under the Hazardous Waste Program.

EPA has provided funding, guidance documents, and technical assistance for states to develop and implement SMPs. The Pesticides In Ground Water Strategy (EPA, October 1991) describes the Agency's goals, policies, management programs, and regulatory approaches for protecting the nation's ground water and is the foundation for the SMPs.

B. Role in This Plan

- Continue to develop the Pesticides and Ground Water State Management Plan Regulation; Provide technical assistance and guidance documents to the states;
- Continue to provide partial financial support to the states for the development and implementation of SMPs;
- Continue to evaluate pesticide fate and transport models, regulate pesticide products that pose a threat to the nation's waters, and continue the move towards safer pesticides; and
- Review and concur with the Generic SMP and review and approve the Pesticide Specific SMPs or else provide written comment on the SMPs deficiencies for state/EPA discussion.

2.6.2 UNITED STATES DEPARTMENT OF AGRICULTURE

2.6.2.1 Consolidated Farm Services

A. Active Programs

- Administer USDA funding for the Farm Bill.

B. Role in this Plan

- Provide Farm Bill information.

2.6.2.2 Agricultural Marketing Services

A. Active Programs

- Collects crop, weather and selected pesticide information by appropriate statistical methods; and
- Implement private applicator restricted use pesticide record keeping program.

B. Role in this Plan

- Provided information for SMP development and implementation in the areas of crop and weather summary data and pesticide use applications.

2.6.3 UNITED STATES GEOLOGICAL SURVEY

A. Active Programs

The US Geological Service (USGS) collects and disseminates water quality data. They cooperatively perform the following functions in South Dakota:

- National mapping program;
- Water-resource data collection;
- Geologic mapping and mineral-resource appraisals;
- Map production;
- Water-resource appraisals (county and water development district studies);
- Geologic information for land-use planning;
- Studies in environmental health;
- Water-resource information for South Dakota Indian Tribes;
- Effects of floods and droughts;
- Lake and reservoir sediments;
- Potential for artificial recharge;
- Use of bedrock aquifers for water supply;
- Quality of urban storm-water runoff;
- Volatile organic chemicals in ground and surface water;
- Earth observation data;
- Geologic information centers; and
- Cooperatively support Water Resources Research Institute.

B. Role in this Plan

- Provide GIS base layer information to the state in such areas as transportation, political boundaries, and surface hydrography. Mylar and digital format 7.5 minute quadrangle maps are available for GIS purposes.

2.6.4 UNITED STATES FISH AND WILDLIFE SERVICE

A. Active Programs

- Wetlands; and
- Environmental enhancements.

B. Role in this Plan

- Provide biological information on species and water issues that may be impacted by pesticide use.

2.6.5 UNITED STATES BUREAU OF RECLAMATION

A. Active Programs

- Special studies.

B. Role in this Plan

- Conduct a 10-year hydrology study to assess the quantity, quality and distribution of surface and ground water in the Black Hills area. The information collected may be of value to the development of the SMP.

2.7 OTHER REVIEWERS OF THE DRAFT SMP

Pesticide and water issues are of concern to all. Several groups have been active in social, environmental, and agricultural issues in South Dakota and will provide an active forum for issue comment. The following agencies, organizations, and special interest groups will be asked to review and comment on the SMP draft:

2.7.1 South Dakota Nonpoint Source Task Force

This group provides a forum for information exchange, discussion, and resolution of nonpoint source conflicts. It serves as a coordinating body for the review and direction of federal, state, and local government nonpoint source programs. The Task Force makes recommendations to the Board of Water and Natural Resources for nonpoint source project funding priorities based on prioritized water bodies (includes aquifers). The Task Force consists of 24 active agency and organization members. (See Appendix E for the Nonpoint Source Task Force Membership by Agency list.)

2.7.2 AGRICULTURAL ORGANIZATIONS

- South Dakota Corn Growers Association;
- South Dakota Soybean Association;
- South Dakota Oil Seeds Council;
- South Dakota Wheat Commission;
- South Dakota Association of Agricultural Cooperatives;
- South Dakota Crop Improvement Association;

- Triazine Network;
- South Dakota Irrigators Association;
- South Dakota Aerial Applicators Association;
- South Dakota Farm Bureau Federation;
- South Dakota Farmers Union;
- South Dakota National Farmers Organization;
- Soil and Water Conservation Society;
- South Dakota Association of Soil Scientists;
- South Dakota State Horticultural Association;
- South Dakota Fertilizer and Ag Chemical Association; and
- South Dakota Association of Conservation Districts.

2.7.3 COMMUNITY GROUPS

- Lakes and Streams Association;
- South Dakota Water Congress;
- Water Development Districts;
- Dakota Rural Action;
- South Dakota Wildlife Federation;
- South Dakota Municipal League;
- South Dakota Association of Rural Water Systems;
- South Dakota Chapter of American Water Works Association;
- South Dakota Association of County Commissioners;
- League of Women Voters;
- Izaak Walton League of America, Inc.;
- Audubon Society;
- Sierra Club; and
- Interested Public.

2.8 TRIBES

There will be an open and continuous exchange of information in the development and implementation of South Dakota's SMP with the Tribes. Tribal representatives are invited to the SMP meetings. The SDDA and DENR are invited to tribal management plan development meetings. The SDDA and DENR have also reviewed and commented on draft management plans for the Cheyenne River Sioux Tribe and the Oglala Sioux Tribe.

2.9 LOCAL BRANCHES OF GOVERNMENT

The Federal Insecticide, Fungicide and Rodenticide Act delegates the authority to regulate pesticides to the states. The SDDA has primacy for pesticides in South Dakota. Local units of governments have the opportunity to petition the Secretary of the SDDA for a pesticide use restriction. If the petition is deemed valid, the department will look at how best to incorporate the request into the State's Pesticide Management Plans.

Local governments may use a local ordinance to influence land use, such as the siting of a pesticide facility. They may use local funds to influence landowner conversion from row crop farming to a less intensive form of farming such as placing land in the Conservation Reserve Program or in pasture. Local government protection of drinking water involves Source Water Protection efforts. These efforts may include data collection on potential contaminant sources and/or use of local funds to buy land for source water protection.

2.10 COORDINATION MECHANISM

The SDDA will act as the repository and dissemination point for SMP information. Information will be sought from and shared with the appropriate PAGWAG members on a regular schedule. After an initial review of disseminated information by the members, a PAGWAG meeting may be scheduled by SDDA, depending upon the members reaction and the plan set forth in components seven and eight of this document. Information will be reviewed and a PAGWAG meeting held (if necessary) within 30 days of the information review. The DENR, the NRCS, SDSU - CES and the SDDA have committed to taking action in areas designated in components seven and eight as needing SMP action. The SDDA, DENR and SDSU have either current Memorandums of Understandings (MOUs) or interagency agreements, and they may be seen in appendices B and D of this document. The NRCS has given SDDA a verbal commitment to reallocate resources as an SMP action (as described in components seven and eight) is required. Signing this document's Concurrence Signature page is written commitment to potential SMP action for the NRCS and for SMP actions not covered under current MOUs or interagency agreements with DENR and SDSU.

COMPONENT THREE
LEGAL AUTHORITY

3.1 INTRODUCTION

States, through the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), may under their own authority develop and implement a pesticide management plan. However, working cooperatively with federal, state, and local government agencies will be essential to ensuring an effective State Management Plan (SMP). State Management Plan development and implementation will require regulatory authorities. It will also require voluntary and specially designed protection programs. These programs may include such elements as, local government involvement in land purchased to protect a wellhead or a county ordinance used to site a pesticide facility away from a sensitive ground water recharge area. This component deals specifically with the legal authorities needed to develop, implement, and enforce a SMP.

Legal authority comes from the 1947 FIFRA (7 U.S.C. §136 et seq.) as amended by the Federal Environmental Pesticide Control Act of October 1972 and the FIFRA amendments of 1975, 1978, 1980, and 1988. Together, they provide for the federal and state regulation of pesticides. The 1978 amendment has several sections giving the states greater responsibility in regulating pesticides. The State has the legal authority to control pesticides (regulate use, transportation, application, storage, etc.) under South Dakota Codified Law (SDCL) §38-20A, SDCL §38-21 and ARSD §12:56 and to protect ground water under SDCL §34A-2-103 and SDCL §38-21. The South Dakota SMP process will be a cooperative effort. The South Dakota Department of Agriculture (SDDA) and the Department of Environment and Natural Resources (DENR) have the majority of SMP responsibilities as the state agencies with statutory authority over pesticides and water resources, respectively.

3.2 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

The SDDA is required by law (SDCL §38-1-18) to promote, encourage and protect the interests of agriculture. It is SDDA's position that on major issues facing agriculture and the environment, sustainable agriculture, integrated pest management, crop rotation, conservation and other sustainable practices are to be looked at with a vision of the future and the need to protect South Dakota's resources.

3.2.1 DIVISION OF AGRICULTURAL SERVICES

A. Legal Authorities

The SDDA is the state lead agency and governor contact for the state to develop and implement the SMP. Through codified law, rule making authority, policy, Memorandums of Understanding (MOU), the State of South Dakota and U.S. Environmental Protection Agency Multi-year Agreement, and the Cooperative Enforcement Agreement of 1985, SDDA regulates the use, sale, transportation, handling, storage, registration and disposal of pesticides in South Dakota. Authority granted pursuant to SDCL §1- 26, §38-20A, and §38-21, authorizes SDDA to administer and carry out the legislative intent related to agency materials inspection, rule making authority, and the regulation and use of pesticides. Questions, comments and appeals relating to the SMP will be addressed through the normal regulatory channels built into policies, enforcement procedures, and hearing procedures. Appeals may also be made directly to the Secretary of Agriculture, for consideration.

CODIFIED LAW; SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

SDCL §1-26 *ADMINISTRATIVE PROCEDURE AND RULES*

All rules, final orders, decisions, opinions, intra-agency agreements and memoranda shall be available for public inspection. Rules in general shall be published. All interested parties shall be afforded a reasonable opportunity to submit data, opinions, or arguments either in writing or orally, at a hearing held for that purpose. Agencies shall consider those submissions regarding the proposed rule. Any interested party may petition to delay the effective date of the rule with the agency that adopted the rule. Appeals may also be made directly to the Secretary of Agriculture.

SDCL §38-20A *PESTICIDES*

Section SDCL §38-20A provides SDDA with authority over the registration, pesticide fee structure, misbranding, inspection and sampling of pesticides.

SDCL §38-20A-49 *Opportunity To Present Views*

This section provides the respondent an opportunity to present his or her views before proceedings take place.

SDCL §38-21 *AGRICULTURAL PESTICIDE APPLICATION*

This statute provides SDDA with authority over disposal of unusable pesticides, recycling of pesticide containers, registration and cancellation of pesticides, use and restrictions on pesticides, storage and handling of pesticides, and formulation disclosure.

SDCL §38-21-15 *Pesticide Handling Causing Injury Or Pollution Prohibited*

This section prohibits handling (transport, store, use, dispose of, or handle) a pesticide in such a manner as to cause injury to humans or to pollute ground water or surface water. Provides for up to a $5,000 penalty per violation.

SDCL §38-21-16 *Reporting Of Pesticide Accidents*

This section allows accident reporting requirements to be developed.

SDCL §38-21-18, -20, -40 *Standards Of Certification And License Requirements*

These sections allow for the certification and licensing of applicators. Private and commercial applicators must be certified for use of restricted use and general use pesticides.

SDCL §38-21-39 *Restricted-use Pesticide Classification*

This section provides SDDA the authority to determine state restricted-use pesticide classification. The SDDA may adopt rules to restrict the use of certain pesticides and may disallow the use of certain pesticides for the entire state or for certain designated areas within the state.

SDCL §38-21-44 *Suspension, Denial & Revocation Or Modification Of License Or Certification*

This section of the law allows the Secretary of SDDA to suspend, deny, and revoke or modify the license or certification of the applicant.

SDCL §38-21-51 *Administration And Enforcement*

This section allows the department to enforce the sections of SDCL §38-21. Regulation of pesticide transportation, storage and disposal, restricted use, restricted designated areas of pesticide use, pesticide record keeping, certification and licensing, and use of pesticides through the irrigation systems are included in this section.

SDCL §38-21-52 *Cooperation And Agreements*

The SDDA has the authority under SDCL §38-21 to enter into cooperative agreements with federal, state or local agencies for purposes of administering pesticide programs, including protecting ground water and surface water from pesticide contamination.

SDCL §38-21-53 *Entry And Inspection*

This section allows for the inspection and sample collection on any public or private lands (all land and water areas) actually or reportedly exposed to pesticides.

SDCL §38-21-57 *Pesticide Regulatory Fund*

This section allows the SDDA to collect funds (public and private sources including legislative appropriations, federal grants, gifts, and fees) to meet expenses and administer the pesticide program.

ADMINISTRATIVE RULES; SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

Chapter 12:56 *PESTICIDES*

Chapter 12:56:02 *Storage And Disposal*

This section requires that pesticides be stored and disposed of in such a manner so as not to contaminate food, feed, or the environment.

Chapter 12:56:03 *Transportation*

This section regulates actions during transportation involving spills, identifies pesticides that are hazardous, and describes the securing of bulk pesticides. Pollution prevention is a key element of this section.

Chapter 12:56:04 and :05 and :12 *Commercial Applicators & Applicator Certification & Private Certification*

Commercial and private applicators are identified in this section by category and are required to have certification. Commercial applicators must also be licensed.

Chapter 12:56:06 *Damage Claims*

This section contains report contents for any pesticide damage claim.

Chapter 12:56:07 *Commercial Application Records*

Requirements for commercial application records and the reporting of this information to SDDA are contained in this section. Records must be kept for three years. Pesticide use survey information may be collected for reporting purposes statewide every three years. More frequent collection may occur in counties with nonpoint source ground water quality monitoring taking place.

Chapter 12:56:15 *Handling And Loading*

This section deals with bulk pesticides and states they shall be handled in a manner as to prevent spillage or discharge.

Chapter 12:56:17 *Operational Area Containment*

This section provides for the containment of pesticides under certain conditions, such as sensitive ground and surface water areas. Pollution prevention is the main goal of this section.

POLICIES; SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

PESTICIDES

Pesticide Compliance Policy Guide Commercial Applicator Records - 450.b

This section clarifies information that is to be included on the pesticide application records.

Dry Bulk Pesticide Storage Enforcement Policy

This section establishes a state enforcement penalty matrix with a violation level and penalty base.

Bulk Pesticides - 160.a

It is the policy of the SDDA to allow the use of automated pesticide distribution systems, which have common connections, provided certain precautions and requirements are met. Cross-contamination must be prevented.

Penalty Policy

Establishes an enforcement penalty matrix with a violation level and penalty base.

Pesticide Compliance Policy Guide - Certification - 120.a

Clarifies when a product is considered a pesticide and registered by EPA under FIFRA and when it is an animal drug regulated under the Federal Food, Drug, and Cosmetic Act (FFDCA). It also clarifies when a private applicator applying a pesticide must be certified.

3.3 SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

The legal authorities of DENR in the development and implementation of the SMP are listed below. These activities are primarily the responsibility of the Ground Water Quality Program (GWQP) and the Geological Survey Program (GSP). Several independent boards have been established which hear public input on relevant issues, advise DENR on matters of policy, and act upon various licenses, permits, and claims relating to the environment or natural resources. The 1989 Centennial Environmental Protection Act (CEPA) provides in SDCL §34A-2-103 for the coordination of a variety of programs, activities, and funds established by state law in addition to the requirements of SDCL §34A-2.

3.3.1 DIVISION OF ENVIRONMENTAL SERVICES

Ground Water Quality Program
Drinking Water Program
Waste Management Program
Water Rights Program

And

DIVISION OF FINANCIAL AND TECHNICAL ASSISTANCE

Geological Survey Program
Watershed Protection Program

A. Legal Authorities

The DENR's SMP legal authority is generally found in SDCL §34A-2 (Water Pollution Control Act). Specifically, SDCL §34A-2-43 prohibits violations of the federal Water Pollution Control Act (33 United States Code (USC) Sec. 1251 to 1376, et. seq.), SDCL §34A-2-45 allows DENR to inspect pollution sources, SDCL §34A-2-46 allows DENR a right of entry upon property where pollution is produced, and SDCL §34A-2-48 allows the Secretary of DENR to issue orders to clean up water pollution. Most violations are enforced through administrative procedures. The procedures are found in the SDCL §34A-2-53 through §34A-2-60, et. seq. Specifically, SDCL §34A-2-53 allows the Secretary of DENR to issue Notices of Violation and seek civil monetary penalties for water pollution violations. SDCL §34A-2-72 allows DENR to initiate civil actions in Circuit Court to immediately restrain water pollution. Under SDCL §34A-2-75, violations of the Water Pollution Control Act may also be prosecuted as misdemeanor criminal violations. (See Appendix G for Ground Water Quality Standards).

In addition to the authority contained in SDCL §34A-2, SDCL §34A-10 allows any person to maintain an action in Circuit Court to restrain illegal impairment of water resources or for a declaratory ruling prohibiting water pollution. Pollution of water resources by hazardous wastes is subject to enforcement under SDCL §34A-11 (Hazardous Waste Management Act), and discharges of other regulated substances impacting water resources are subject to enforcement under SDCL §34A-12 (Regulated Substance Discharges).

South Dakota Codified Law §34A-12-3 creates a Regulated Substance Response Fund, which may be accessed by the Secretary of DENR to clean up pollution from SDCL §34A-2 violations under certain circumstances, including failure of a responsible party to take necessary remedial actions. Under SDCL §34A-12-6, DENR may then maintain a civil legal action against the responsible party to cost recover amount expended from the fund for remediation. (See Appendix C for Regulated Substance Discharges Rules).

South Dakota's DENR has been delegated the primary enforcement of the federal Safe Drinking Water Act by EPA. South Dakota Codified Law §34A-3A - Safe Drinking Water, authorizes the development of a voluntary wellhead protection program, a public water supply supervision program, and rulemaking authority for drinking water standards. Administrative Rules of South Dakota 74:04:05 - Drinking Water Standards, specifies Maximum Contaminant Levels (MCLs), monitoring requirements, variances from monitoring requirements, increased monitoring requirements under certain conditions, and record keeping.

3.4 SOUTH DAKOTA DEPARTMENT OF HEALTH

A. Legal Authority[1]

No Legal Authority.

3.5 PESTICIDES AND GROUND WATER ADVISORY GROUP

The Pesticides and Ground Water Advisory Group (PAGWAG) currently consist of the following: SDDA, DENR, Natural Resources Conservation Service (NRCS), the Cooperative Extension Service (CES), South Dakota State University (SDSU), the Fertilizer and Ag Chemical Association, and a registrant representative. Advisors will assist SDDA in the development and implementation of the Generic and Pesticide Specific State Management Plans for South Dakota.

The advisors have the following legal authorities in the SMP:

A. Legal Authority[1]

No Legal Authority.

3.6 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE - OTHER

3.6.1 DIVISION OF RESOURCE CONSERVATION AND FORESTRY

A. Legal Authority[1]

No Legal Authority.

[1] There are only a few agencies that have any legal authority in the development, implementation, and enforcement of SMPs. In South Dakota, SDDA and DENR have statutory authority over pesticides and water resources, respectfully. On the federal side EPA has authority over both pesticides and water pollution. This section will reinforce Component Two (Roles and Responsibilities) and emphasizes the fact that it takes more than the regulatory agencies to develop and implement SMPs. Component Three recognizes those agencies, groups, and organizations that are cooperatively participating in SMP development and implementation.

3.7 SOUTH DAKOTA BOARD OF REGENTS
SOUTH DAKOTA STATE UNIVERSITY
SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION
COOPERATIVE EXTENSION SERVICE

A. Legal Authority[1]

No Legal Authority.

3.8 SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

A. Legal Authority[1]

No Legal Authority.

3.9 LABORATORY

Only laboratories that are qualified and capable of performing analysis on water samples, soil samples, vegetation samples, and/or pesticide samples will be used.

A. Legal Authority[1]

No Legal Authority.

3.10 FEDERAL AGENCIES

3.10.1 ENVIRONMENTAL PROTECTION AGENCY - PESTICIDE REGULATION

A. Legal Authorities

7 U.S.C. §136 et seq.
The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The FIFRA as amended, regulates pesticides. This act allows EPA to address pesticide concerns in ground water on a national level. By cooperating with the states through Performance Partnership Agreements, EPA passes on that authority, along with some funding.

[1] There are only a few agencies that have any legal authority in the development, implementation, and enforcement of SMPs. In South Dakota, SDDA and DENR have statutory authority over pesticides and water resources, respectfully. On the federal side EPA has authority over both pesticides and water pollution. This section will reinforce Component Two (Roles and Responsibilities) and emphasizes the fact that it takes more than the regulatory agencies to develop and implement SMPs. Component Three recognizes those agencies, groups, and organizations that are cooperatively participating in SMP development and implementation.

The EPA regulatory authority includes pesticide initial registration, re-registration, and legal availability. Provisions under section 3 and section 6 of FIFRA provide for this regulation (refer to Box 3.1). Under section 3 "other regulatory restrictions", EPA would undertake rule making with publication of the proposed action in the Federal Register. Publication of the details in the Federal Register provides an opportunity for public comment on classifying one or more pesticides for restricted use. The SMPs would be specified as part of the restrictions required. The basis for this action is a determination that the reduction in risk outweighs the decrease in benefits imposed by the restrictions.

Box 3.1
Pesticide
Restrictions and Cancellation
FIFRA Sections 3 and 6

Section 3(d)(1)(C)(ii) of FIFRA allows EPA to restrict the use of pesticides through proposed rulemaking authority. The 40 CFR parts 152 and 156 - Pesticides and Ground Water State Management Plan Regulation, Proposed Rule would allow SMP development and implementation. Section 6(b) would allow the cancellation of any product that causes unreasonable adverse effects on the environment. The basis for this determination is, as the pesticide is currently used, its risk outweighs the benefits, and cancellation is warranted.

Through FIFRA the EPA also has the legal authority to protect water resources. This includes both ground water and surface water. In the SMP development, the waters to be protected are ground water and hydraulically connected surface waters.

33 U.S.C. § et seq. *Clean Water Act (CWA)*

The CWA was established to protect the integrity of the nation's waters. Grants to protect the nation's waters are awarded to states for development and implementation of state wellhead protection programs, for development of statewide ground water protection strategies, for nonpoint source pollution programs, and other water quality programs.

42 U.S.C. §300 et seq. *The Safe Drinking Water Act (SDWA)*

The SDWA is designed to ensure the safety of public drinking water supplies. The Act requires EPA to establish both national drinking water quality standards (MCLs) and monitoring requirements for suppliers of public water. Amendments to the SDWA authorize the states to establish wellhead protection programs and conduct source water assessments for the protection of public drinking water supplies.

41 U.S.C. §6901 et seq. *The Resource Conservation and Recovery Act (RCRA)*

The RCRA regulates the disposal of hazardous wastes, which include pesticides or pesticide contaminated materials deemed no longer useful.

42 U.S.C. §9601 et seq. *The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*

The CERCLA provides EPA with the authority to require corrective actions. It also allows for assessment and recovery of damages from liable parties. Enforcement activities under CERCLA could be involved in pesticide spills, leaks, misuse or illegal applications. Also, CERCLA is the only federal law that provides for the "temporary provision of an alternative water supply" under circumstances of an imminent human health threat.

3.10.2 U.S. DEPARTMENT OF AGRICULTURE

3.10.2.1 NATURAL RESOURCES CONSERVATION SERVICE

A. Legal Authority[1]

No Legal Authority.

3.10.2.2 CONSOLIDATED FARM SERVICES

A. Legal Authority[1]

No Legal Authority.

3.10.2.3 AGRICULTURAL MARKETING SERVICES

A. Legal Authority[1]

No Legal Authority.

3.10.3 UNITED STATES GEOLOGICAL SURVEY

A. Legal Authority[1]

No Legal Authority.

3.10.4 UNITED STATES FISH AND WILDLIFE SERVICE

A. Legal Authority[1]

No Legal Authority.

3.10.5 UNITED STATES BUREAU OF RECLAMATION

A. Legal Authority[1]

No Legal Authority.

[1] There are only a few agencies that have any legal authority in the development, implementation, and enforcement of SMPs. In South Dakota, SDDA and DENR have statutory authority over pesticides and water resources, respectfully. On the federal side EPA has authority over both pesticides and water pollution. This section will reinforce Component Two (Roles and Responsibilities) and emphasizes the fact that it takes more than the regulatory agencies to develop and implement SMPs. Component Three recognizes those agencies, groups, and organizations that are cooperatively participating in SMP development and implementation.

3.11 INDUSTRY

3.11.1 REGISTRANT

A. Legal Authority[1]

No Legal Authority.

3.11.2 SOUTH DAKOTA FERTILIZER AND AG CHEMICAL ASSOCIATION

A. Legal Authority[1]

No Legal Authority.

3.12 REVIEWERS OF DRAFT SMP - ORGANIZATIONS AND GROUPS

Several agencies, organizations, and special interest groups will be asked to review and comment on the SMP. These are are:

3.12.1 ACTIVE AGRICULTURAL ORGANIZATIONS

- South Dakota Nonpoint Source Task Force;
- South Dakota Corn Growers Association;
- South Dakota Soybean Association;
- South Dakota Oil Seeds Council;
- South Dakota Wheat Commission;
- South Dakota Association of Agricultural Cooperatives;
- South Dakota Crop Improvement Association;
- South Dakota Irrigators Association;
- South Dakota Aviation Association;
- South Dakota Farm Bureau Federation;
- South Dakota Farmers Union;
- South Dakota National Farmers Organization;
- Soil and Water Conservation Society;
- South Dakota Association of Conservation Districts;
- South Dakota Association of Soil Scientists;
- South Dakota Fertilizer and Ag Chemical Association; and
- South Dakota State Horticultural Association.

A. Legal Authority[1]

No Legal Authority.

[1] There are only a few agencies that have any legal authority in the development, implementation, and enforcement of SMPs. In South Dakota, SDDA and DENR have statutory authority over pesticides and water resources, respectfully. On the federal side EPA has authority over both pesticides and water pollution. This section will reinforce Component Two (Roles and Responsibilities) and emphasizes the fact that it takes more than the regulatory agencies to develop and implement SMPs. Component Three recognizes those agencies, groups, and organizations that are cooperatively participating in SMP development and implementation.

3.12.2 Active Community Groups

- Lakes and Streams Association;
- South Dakota Water Congress;
- Water Development Districts;
- Dakota Rural Action;
- South Dakota Wildlife Federation;
- South Dakota Municipal League;
- South Dakota Association of Rural Water Systems;
- South Dakota Chapter of American Water Works Association;
- South Dakota Association of County Commissioners;
- League of Women Voters;
- Izaak Walton League of America, Inc.;
- Audubon Society;
- Sierra Club; and
- Interested Public.

A. Legal Authority[1]

No Legal Authority.

3.13 TRIBES

A. Legal Authority[1]

No Legal Authority.

However, Tribal Management Plans are an option for some tribes.

3.14 LOCAL BRANCHES OF GOVERNMENT

A. Legal Authority

Restricted Legal Authority.

The FIFRA delegates the authority to regulate pesticides to the states. The SDDA has primacy for pesticides in South Dakota. Local units of governments have the opportunity to petition the Secretary of SDDA for a pesticide use restriction. If the petition is deemed valid, SDDA will look at how best to incorporate the request into the SMP. Also, most local units of government can zone for the placement of a pesticide facility through local zoning ordinances.

[1] There are only a few agencies that have any legal authority in the development, implementation, and enforcement of SMPs. In South Dakota, SDDA and DENR have statutory authority over pesticides and water resources, respectfully. On the federal side EPA has authority over both pesticides and water pollution. This section will reinforce Component Two (Roles and Responsibilities) and emphasizes the fact that it takes more than the regulatory agencies to develop and implement SMPs. Component Three recognizes those agencies, groups, and organizations that are cooperatively participating in SMP development and implementation.

COMPONENT FOUR
RESOURCES

4.1 INTRODUCTION

The state is committed to meeting the needs of a State Management Plan (SMP) with personnel trained in agronomy, hydrology, pedology, geology, pesticides dynamics, human health, chemistry and economics. Assistance from various cooperators: the Environmental Protection Agency (EPA), the South Dakota Department of Agriculture (SDDA), the Department of Environment and Natural Resources (DENR), the Department of Health (DOH), South Dakota State University (SDSU), the Natural Resources Conservation Service (NRCS), pesticide dealers, the Fertilizer and Ag Chemical Association and the pesticide registrant will ensure South Dakota's SMPs are the best they can be.

4.2 PERSONNEL

4.2.1 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

Organizational Structure - Agricultural Services is one of three divisions in SDDA and within the division, the Office of Agronomy Services is responsible for developing and implementing the SMP. The Office is made up of seven program specialists, two agricultural investigators (primary responsibilities: complaints and investigations) seven agricultural inspectors (primary responsibilities: investigations), six agricultural inspectors (primary responsibilities: routine compliance inspections) and an office administrator. The SMP activities will be carried out by the SMP program specialist , the enforcement program specialist, and the agricultural inspectors. The Office of Agronomy Services administrator will oversee their activities.

Technical Expertise - The following are the educational and experience requirements for the administrator, program specialists and inspectors who are responsible for the SMP activities.

Administrator - This person oversees programs of statewide importance to the agricultural community. These programs protect the public, environment, and economic interest of agriculture. The incumbent must have a thorough knowledge of the economic and environmental ramifications of environmental and natural resource management. A thorough knowledge of all federal and state laws and rules dealing with agriculture and the environment is required. The incumbent must be able to effectively communicate both orally and in writing. The incumbent must be able to work cooperatively with staff, federal, state and local officials, as well as the public. A bachelor's degree in an agricultural field along with three years professional service in agriculture is required.

Program Specialist - This position oversees statewide agricultural programs, provides technical support to staff and industry, and coordinates agricultural program activities. The position requires the incumbent to interpret state and federal regulations, supervise professional staff and develop and administer agricultural programs. A thorough knowledge of environmental and natural resource management must be balanced with agricultural economic considerations.

Some knowledge of the states water resources is also necessary. An understanding of pesticide leaching and runoff properties, soil properties, and the interactions that can take place is necessary. Cooperative working relationships with federal, state, and local agencies is necessary. Technical report writing and oral communication skills are required. A bachelor's degree in an agricultural field along with two years equivalent combination of education and experience is required for the position.

Agricultural Inspector - This position is the investigative arm of the department. An incumbent inspects facilities, establishments, agencies, equipment, products, and individuals; collects samples, investigates adverse incidents to persons and the environment; recommends or takes enforcement action to ensure compliance with state and federal regulations concerning the storage, transportation, handling, disposal, and use of agricultural products. There is daily contact with producers, business owners, and the public. Pollution prevention programs enacted for the protection of people and the environment depend on the compliance evaluation capabilities of the field personnel. Educational requirements are a bachelor's degree in an agricultural field and no experience is necessary.

4.2.2 S. D. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Organizational Structure - The DENR is organized into two divisions. They are the Division of Environmental Services and the Division of Financial and Technical Assistance. The Ground Water Quality Program is one of six programs within the Division of Environmental Services. The Geological Survey is a program in the Division of Financial and Technical Assistance. The DENR's responsibilities for the Pesticides and Ground Water State Management Plan (SMP) will be primarily accomplished by the Ground Water Quality and Geological Survey Programs. Department of Environment and Natural Resources personnel involved in the SMP consists of one or more of the following positions: natural resources engineer, geologist, natural resources technician, and hydrologist.

Technical Expertise - Following are the education and experience requirements for the DENR positions responsible for SMP activities.

Natural Resources Engineer - This position is responsible for supervising statewide natural resources engineering programs or major projects with significant statewide impact to ensure implementation of programs and compliance with state and federal statutes, regulations and policies. An incumbent in this position is required to have knowledge of the principles of environmental and natural resources engineering; the principles and practices of the environmental control and natural resources fields; the causes and control of pollution; laws and regulations pertaining to environmental quality and natural resources management; investigative procedures; the state's natural resources; and technical report writing. The incumbent must be able to effectively deal with the public and to plan, organize, and direct work effectively. An equivalent combination of education and experience of the following is required: a bachelor's degree in civil, geological, or environmental engineering, and up to three years of responsible experience in environmental control or natural resources fields is necessary.

Geologist - This position conducts major geologic and/or hydrogeologic investigations to evaluate geologic and hydrologic resources in a specific area. An incumbent in this position is required to have knowledge of: the principles of geologic and hydrogeologic investigative procedures including knowledge of methods and equipment used in geological explorations; principles and practices of geology; technical report writing; mathematics; physics; and chemistry. The incumbent must have an analytical ability and be able to prepare and present accurate reports both orally and in writing. The incumbent must be able to conduct geologic and/or hydrogeologic investigations. An equivalent combination of education and experience is required; a bachelor's degree in geology, geological engineering, and one year of experience as a geologist is necessary.

Natural Resources Technician - This position inspects, investigates, records, obtains samples of natural resources, and maintains equipment necessary to perform these functions; assist in other field or office capacities as assigned; and assists in the assessment of natural resources of the state. An incumbent in this position is required to have knowledge of: basic methods and equipment used in geologic and hydrogeologic investigations; map reading; and of basic terminology and principles of natural resources. The incumbent must have the ability to gather and compile information accurately and operate and maintain the equipment used in the job. An equivalent combination of education and experience is required; a high school diploma or possession of a GED certificate and one year of experience related to natural resources is necessary.

Hydrologist - This position is responsible for supervising major hydrology programs and research projects to ensure compliance with state and federal statutes, regulations, policies, and guidelines, ensuring that adequate information is available for proper development and protection of the state's water resources. An incumbent in this position is required to have knowledge of: the principles of hydrology; hydrological investigative procedures; the state's water resources; the laws and regulations pertaining to the state's water resources; and technical report writing. The incumbent must be able to effectively deal with the public, work with and advise others in technical matters including hydrology, communicate well, and have analytical ability. An equivalent combination of education and experience is required; a bachelor's degree in hydrology, geology, geological engineering, civil engineering, agricultural engineering, or a related engineering field and up to three years of experience as a hydrologist is necessary.

4.2.3 NATURAL RESOURCES CONSERVATION SERVICE

Organizational Structure – The Natural Resources Conservation Service is the lead conservation agency under the United States Department of Agriculture (USDA). The NRCS speaks for the health and well-being of the nation's land-soil, water, air, plant, and animal resources. The NRCS relies on many partners to help set conservation goals, work with people on the land, and provide assistance. Its partners include conservation districts, state and federal agencies, NRCS Earth Team volunteers, agricultural and environmental groups and with their own technical and support staff.

The nation's 3,000 conservation districts – virtually one in every county – are the heart of the conservation delivery system. These units of local government, organized by local citizens under state law, operate on the premise that local people know the most about local needs. They link NRCS with their neighbors and with local priorities for soil and water conservation. They also augment the work of NRCS conservationists with district programs and with their own technical and support staff.

The strength of NRCS is in its work force. Most of NRCS's employees serve in USDA's network of local, county-based offices. The rest are state, regional, and national offices, providing technology, policy and administrative support.

In South Dakota, NRCS has 66 field and tribal liaison offices located across the state. In addition, South Dakota has support staff located in Huron and field support offices located in Brookings, Pierre, and Rapid City.

Technical Expertise - NRCS personnel that might be involved in the SMP consist of, but are not limited to, the following positions:

District Conservationist – The incumbent in this position is responsible for developing and carrying out a comprehensive soil and water conservation program in support of the local conservation district. The principal role of this position is to advise and assist landusers in the development of Conservation Management Systems. The incumbent works with landowners and operators, individually and in groups, to develop conservation plans and apply practices according to established policies and procedures, and in accordance with the landuser's decisions. The incumbent also assists the local conservation district with technical guidance, participates in district meetings, and serves as the agency representative to the board.

Soil Scientist – The incumbent in this position is responsible for updating soils information and providing basic soil services to users of soils information for proper land use and conservation planning. Soils scientists are responsible for mapping soils in soil survey areas, updating older surveys, provides leadership in developing soil potential ratings, and preparing descriptions and interpretations for map units in accordance with National Soils Handbook standards. The incumbent also is responsible for maintaining soil information contained in the South Dakota Technical Guide, providing assistance to agencies, groups, and individuals on the utilization of published soil survey information, and on-site soil inventories and evaluations.

Geographic Information Systems Specialist – The specialist in this position serves as the Geographic Information System (GIS) specialist in support of natural resource programs with a primary focus on integrating NRCS natural resource planning principals and guidelines with GIS for the NRCS field offices. The incumbent assists in identifying and trouble shooting problems in resource inventories and soil deliniations when identifying and obtaining available soil survey spatial and tabular data needed for analysis. Produces GIS products to facilitate communications with project sponsors and the general public. Supports projects statewide by acquiring digital soils data, developing workable GIS methods, transferring data efficiently, and producing outputs. In addition, the incumbent provides GIS technical support and consultation to other agencies, i.e., U.S. Geological Survey, Bureau of Indian Affairs, and Indian reservations.

Agronomist – The incumbent in this position provides technical leadership, guidance, and assistance in the agronomic phases of all NRCS programs. Technical guidance and direct assistance to field office personnel is provided to carry out compliance planning for the Food Security Act and Food, Agriculture, Conservation, and Trade Act. In addition, the agronomist is responsible for solving agronomic problems on individual farms or group projects. Assistance with vegetative and management practices to secure a balanced program of soil and moisture conservation. Conducts training in Agronomy for field office personnel. Provides information to field offices on agronomic techniques for inventorying, analyzing, and selecting treatment alternative and use and application of the Revised Universal Soil Loss Equation and the Wind Erosion Equation. The incumbent provides leadership in promoting conservation tillage through tours, conferences, and assistance to field offices. Works with operators, groups, units of government, and business people to stimulate interest, different farming methods with improved agronomic, economic and environmental benefits.

Agricultural Engineer – The incumbent in this position provides professional engineering services in field investigations, design, installation, and maintenance of engineering practices in the area served. Conducts investigations to obtain planning and design data for engineering practices such as floodwater retarding structures, waterways, irrigation structures, determines need, makes site selection, supervises installations, and checks completed practices, spot checks works of improvement at the field office level, advises field office staff on engineering procedures, develops technical guidelines for use by technicians, and develops preliminary designs for structures of varying engineering complexity.

4.2.4 SOUTH DAKOTA BOARD OF REGENTS

South Dakota State University - South Dakota Agricultural Experiment Station

Technical Expertise – The SDSU Agricultural Experiment Station (AES) provides research based answers to agricultural issues in South Dakota. Technical expertise is available at the AES, but funding support is needed to carry on applied research efforts, and to allow the development of educational programs specifically dealing with water quality and pesticide SMP issues. At the AES staff are experts in most areas of pest management and pesticide behavior. These individuals are available to consult with SDDA and contribute to the development and evaluation of the SMP.

South Dakota State University - Cooperative Extension Service

Technical Expertise - The South Dakota Cooperative Extension Service (CES) provides unbiased research based information to the agricultural community. Extension Specialist in the Agricultural and Biological Sciences college at SDSU and Extension Agents in the counties across the state provide education regarding ground water contamination prevention and correct pesticide use. A portion of the SDDA and EPA Consolidated Pesticide Cooperative Agreement has been designated to provide training to pesticide applicators in South Dakota. This is a joint project between SDDA and SDSU. This cooperative effort between SDDA and SDSU on both private and commercial pesticide applicator training undergoes a yearly review and update.

The CES at SDSU has established diverse educational and technical expertise with programs addressing pesticide and water protection SMP related issues. Areas addressed are pesticides, water quality, environment, environmental health, and agricultural education through integrated pest management, pesticide applicator training, sustainable agriculture, waste management, and water quality programs.

4.3 FUNDING

SMP costs will be met through a variety of federal, state, county, and private agencies, along with participating individuals and companies (refer to Box 4.1 for planning category and participant).

Box 4.1
Planning Category And Participants

Plan Development - SDDA, DENR, and the Advisory Group;
Product Development, Label Changes, Registration, Reregistration - Registrant and SDDA;
Monitoring - DENR, SDDA, Registrant, and local PWSs;
Immediate Response and Cleanup - SDDA, DENR, Registrant, and the Responsible Party;
Long Term Cleanup - Responsible Party;
Prevention Measures - SDDA, SDSU, NRCS, DENR, Dealers, and the Registrant;
Research – SDDA, SDSU, and Registrant;
Education and Public Information - SDSU, SDDA, DENR, Retail Dealer, Commodity Groups, and Registrant;
Soils - NRCS, SDDA, and, SDSU; and
Enforcement - SDDA and DENR.

4.3.1 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

The SDDA receives State general funds, EPA Pesticides and Ground Water funds, EPA Enforcement funds, EPA Certification funds, EPA Pesticide Handling and Disposal Program funds, and State, Federal and other Special funds when available (for example 1993 - $200,000 in flood relief for flood damaged pesticides). The Performance Partnership Agreement (PPA) contains the most current funding information for each category and is available upon request.

The SDDA collects fees from the registration of pesticide products (approximately 80% of the pesticide products registered are for non-agricultural use). The biennial fee is $175/product. Of this amount SDDA receives $40/product for pesticide program use. The department also collects a $25 fee for each pesticide applicator license issued. The SDDA has the authority to charge a fee of $5 for each private pesticide applicator certification issued, but to date has not implemented the charge. The department for each pesticide dealer's license issued collects a fee of $50. The department Waste Pesticide Collection, Disposal and Container Recycling Program collects $25/pesticide product registered in South Dakota. The department has the authority to accept donations from public and private sources. To date support of the SMP process has been through the realignment of current funding sources. As the SMP process moves forward in South Dakota, current funding levels will be reevaluated.

4.3.2 DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

The DENR also receives state general funds and EPA grant funds. Under the PPA, through both section 106 of the Clean Water Act (Ground Water) and section 319 the Clean Water Act (Nonpoint Source), the DENR receives EPA funds that are applicable to the development and implementation of SMPs. State Management Plan funding is included in the PPA with State, EPA and other funding information available upon request. The DENR GWQP will continue to participate as necessary in SMP efforts through this agreement.

Currently, a statewide ground water quality monitoring network is being established by DENR. One of the uses of the network will be to examine pesticides in ground water. Establishment of the network is being funded through DENR ($182,000 state funds) and an EPA section 319 grant ($237,000). This includes installation of the monitoring wells and dedicated sampling equipment for each well. Sampling and analysis of ground water from the network will cost approximately $98,000 to $117,000 annually at current sampling frequencies and for current lists of analytes.

4.3.3 REGENT PROGRAMS

South Dakota State University - South Dakota Agricultural Experiment Station

There are no specific funds allocated for research related to ground water protection. When particular research needs develop, grant funding or other funding will be secured to allow specific pesticide and water quality questions to be investigated.

South Dakota State University - South Dakota Cooperative Extension Service

Funds are available for general pesticide education, which includes ground water and surface water protection, however no funds are designated specifically for SMP pesticide education. As ground water protection needs develop, resources will be allocated to address those needs based on the severity of the problem and the availability of funds.

4.3.4 REGISTRANT[1]

The registrants' expertise, assistance and cooperation will be sought and encouraged when carrying out the following activities:

- Monitoring;
- Remediation;
- Providing Safe Drinking Water;
- Inspections;
- Education;
- Remediation;
- Well Replacement;
- BMP Development;
- Chemical Expertise;
- Public Education;
- Product Reformulation;

[1] Registrant – "Registrant" means a person who has registered any pesticide pursuant to the provisions of the Federal Insecticide Fungicide and Rodenticide Act

- Site Assessment;
- Monitory Incentives; and/or
- Label Changes.

4.3.8 DEALERS/FERTILIZER AND AG CHEMICAL ASSOCIATION

Dealers annually provide updated agricultural management programs to their customers. As the SMP process is developed and implemented dealers can incorporate best available SMP information into their programs. Specific label information, as well as water quality and pesticide use data can be presented as a service to their customers.

4.4 FUTURE FUNDING

The following estimates are for SMP development and implementation. Funding sources for complete SMP development and implementation have not yet been determined. However, it is anticipated that EPA, the state and the registrant will bear most, if not all of the costs for SMP development and implementation. Future funding sources may include, but are not limited to state general and other funds, registrants, EPA sections 106 and 319 funds, pesticides and ground water funds, and the Agricultural Conservation Grants Program.

4.4.1 SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

The SDDA will continue looking to EPA for funding of the SMP. It is hoped that more federal resources will be secured to implement the SMP process. A program specialist will continue the development and implementation of the SMP.

- Estimated costs for Pesticides and Ground Water Aquifer Vulnerability Mapping will be between $700 and $800 per 1:24,000 scale quadrangle for the following basic information layers: transportation; hydrography; surficial aquifers; soils; well head protection areas; and aquifer sensitivity[2] There are over 1,500 7.5' quadrangles for the state. Not all represent areas of a sensitive nature and so not all will need to be digitized. It is estimated that 75% of the quadrangles may need to be digitized. Work will continue with SDDA, the East Dakota Water Development District (and the other districts), the NRCS, DENR, county governments and Plains Research to develop these base maps. The estimated cost of this project over the next 10 years is approximately $500,000.

- Collection of pesticide use and sales data will come from several sources. The SDDA will work with the pesticide industry, SDSU, and the state Agricultural Statistics Service to develop the most effective and efficient method to obtain pesticide sales and use data. The cost for this project is estimated at $20,000 per year.

- Enforcement actions and investigative costs related to PSSMPs may require additional enforcement funding from EPA. A funding level increase will be dependent on the number of ground water pesticide detections.

[2] A watershed map layer has been suggested as an additional layer to the base map.

4.4.2 DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Funding sources for the remediation of pesticide contaminated ground water may vary. The responsible party handles point source pesticide contamination remediation. Nonpoint source pesticide contamination remediation has no special specific funding and may involve federal, state, local and registrant funding opportunities.

- Two staff members will allocate most of their time to the collection of ground water and surface water samples, data compilation and interpretation, sampling network maintenance, and other concerns related to the SMP. It is estimated $55,000 per year in SMP costs will be only a portion of a larger water quality assessment effort.

- Estimated cost of laboratory analysis of water from the Statewide Ground Water Quality Monitoring Network for one year is approximately $50,000 for sample analysis of between 23 and 27 pesticides plus $35,000 for sampling shipping and other laboratory analytical costs. If the frequency of sampling is increased above that described in component six of this document and if an expanded list of analytes is required, then the associated costs will rise commensurately.

4.4.3 REGENT PROGRAMS

Cooperative Extension Service

Many of the activities the CES will be involved in will involve redirection of county and extension specialist staff to address the information and education efforts of the SMP.

- Additional operation and maintenance funds will be necessary. The current CES estimate is $13,000 per year in additional funds will be needed to develop and implement the SMP.

SDSU - Teaching

Additional funds are needed to complete expected SMP activities. Also, as development of PSSMPs are undertaken a Pesticides and Ground Water Advisory Group (PAGWAG) may uncover additional educational funding needs.

- The additional funding need for updating and maintaining preventative ground water contamination educational materials is estimated at $2,000 to $3,000 per year. Initial educational material development may require additional staff, estimated at $10,000 for the first year to meet educational objectives.

Agricultural Experiment Station

Additional funding is needed for SMP related research.

- The total one time cost of funding required for Pesticide Contamination in Ground Water Research is estimated between $100,000 and $150,000 for in-house evaluation, development of best management practices, and study of leaching mechanisms of a specific pesticide to prevent or reduce pesticide contamination in ground water.

4.4.4 USDA -NATURAL RESOURCES CONSERVATION SERVICE

The objective of the NRCS is the sound use and management of South Dakota's natural resources to prevent their degradation and assure their sustained use and productivity while considering the social, cultural, and economic needs of landusers. This objective is implemented by the voluntary planning and application assistance provided to landusers in the implementation of sound conservation management systems. The role of NRCS in the SMP is to act with other state and federal groups or agencies on policy development, technology transfer, and information dissemination to landusers.

- To accomplish these actions in the SMP, NRCS, in South Dakota, will continue to involve staff in the development of the SMP and the PAGWAG. The NRCS field offices will also be available to disseminate information pertaining to sound ground water and surface water management. In addition, if an identified ground water or surface water concern arises, (i.e., special restrictions placed on the use of a pesticide identified in a pesticide specific SMP) these concerns will be addressed in Resource Management System planning with producers in the affected area.

4.4.5 REGISTRANTS:

The registrants of SMP pesticides may offer their expertise, assistance and cooperation in dealing with SMP activities. The following is a current list of registrants registering proposed SMP pesticides in South Dakota:

- NOVARTIS;
- UNITED AGRI PRODUCTS;
- ZENECA INC;
- MONSANTO COMPANY;
- BASF CORPORATION;
- RHONE – POULENC;
- DUPONT;
- DOW ELANCO; and
- BAYER.

4.4.6 FERTILIZER AND AG CHEMICAL ASSOCIATION

The Fertilizer and Ag Chemical Association may offer its expertise, assistance, and cooperation in dealing with SMP activities.

COMPONENT FIVE
BASIS FOR ASSESSMENT AND PLANNING

5.1 INTRODUCTION

One of the principles outlined by the Environmental Protection Agency (EPA) is to base State Management Plans (SMPs) on protection activities unique to hydrogeologic settings, pesticide usage patterns, and the agronomic practices of each state. South Dakota will continue to collect data in sensitive and vulnerable areas, providing information on the occurrence, movement, and quality of ground water, while at the same time providing information on the quantity of pesticides used and the location of that use within the state. Many cooperators will be involved in the development and implementation of the SMP.

5.2 SOUTH DAKOTA'S AGRICULTURE

5.2.1 LAND USE

South Dakota depends on agriculture more than any other state in the union. It is the state's number one industry. Sales of agricultural commodities total more than $3 billion each year. A related, South Dakota industry, horticulture, is a $55 million per year industry in South Dakota.

Table 5.1 Land Use Statistics For South Dakota, 1992.

Land Use	Acres	% Of Total
Rangeland	21,932,800	44.4
Cropland	16,436,300	33.3
Water & Federal Land	3,894,800	7.9
Minor Uses	3,256,700	6.7
Pastureland	2,158,000	4.5
Developed Land	1,135,300	2.2
Forestland	540,100	1.0

Source: 1992 Natural Resources Inventory Land Use For South Dakota.

South Dakota had 35,000 farms in 1992, (1992 U.S. Census), averaging 1,263 acres in size. Total land in farms was 44,200,000 acres out of a total of 49,310,080 acres in the state. See Table 5.1 for land use in acres for South Dakota in 1992. Indian reservations comprised 6.9 million acres according to the 1992 U.S. Census. South Dakota has 1.7 million acres of forest, 3.4% of its total land area, according to the 1988 South Dakota's Timber Resources report. See Table 5.2 for a break down of South Dakota's forested land. (This number is different from the one used in Table 5.1 because of the way the two agencies calculate what constitutes an acre of forestland).

Table 5.2 Forestlands Of South Dakota.

Forestland	Acres	% Of Total
Ponderosa Pine	1,400,000	82
Other	204,300	12
Elm/Ash	95,700	6.0

Source: 1988 South Dakota's Timber Resources Report.

In 1992, the South Dakota Agricultural Statistical Service (SDASS) published information on South Dakota crops planted, the acreage for each crop and the percent of the crop acres receiving a pesticide application. The top five crops planted or harvested in South Dakota in 1992 were corn, soybeans, other spring wheat, alfalfa hay, and all other hay. Table 5.3 contains this information.

5.2.2 IRRIGATION

Table 5.3 1992 Crops Planted In South Dakota. Total Acreage And Percent Receiving Pesticide Applications.

Crop	Acres Planted	Acres Harvested	Herbicide %	Insecticide %
	1,000(s) Acres			
WHEAT, ALL	4,385			
Winter	1,650		47	2
Durum	35			
Other Spring	2,700		74	<1
CORN	3,800		92	12
For Grain		3,300		
For Silage		420		
SORGHUM	580			
For Grain		380		
For Silage		100		
OATS	900			
BARLEY	420			
RYE	55			
FLAXSEED	15			
POTATOES	6.5			
SOYBEANS	2,300		95	1
HAY, ALL		4,200		
Alfalfa Hay		2,200		
All Other Hay		2,000		
SUNFLOWER, ALL	400			
Sunflower Oil	390			
Sunflower Non-Oil	10			

Source: South Dakota Agricultural Statistics Service 1992-1993.

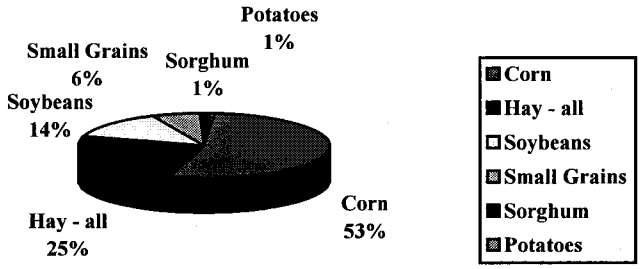
The 1992 South Dakota Irrigation Report indicated ninety-five aquifers or management units within aquifers permitted for irrigation use, with 907,693 acre-feet of ground water appropriated for use. Only 64,892 acre-feet of water was reported to have been pumped, however. According to the 1992 U.S. Census, harvested cropland irrigated in South Dakota in 1992 accounted for 371,263 acres. This equals 4.9% of the farms in South Dakota with some form of irrigation (ground water and/or surface water). See Figure 5-1 for irrigated land acres by crop in South Dakota.

5.2.3 PESTICIDE USE ASSESSMENT

The total number of agricultural pesticides registered in South Dakota as of April 1995 was 1,396 or 19% of the total 7,400 pesticide products registered for that year. Even though non-agricultural pesticide products make up the greatest share of pesticide products registered in South Dakota the registration tracking system does not record what that labeled use is. South Dakota does not record non-agricultural active ingredient totals or private applicator use of agricultural product active ingredients.

Applications of pesticides have been tracked in South Dakota by several means. The first is the South Dakota Department of Agriculture's (SDDA's) Commercial Applicator Summary Form (see Appendix K). The last compiled (statewide) data collection is from the year 1992. The 1992 data for commercial applications indicate 2,4-D (3,705,672 acres) was the most commonly used pesticide, followed by dicamba - Banvel[1] (2,218,910 acres), glyphosate - Roundup (647,214 acres), metsulfuron-methyl - Ally (572,751 acres), trifluralin - Treflan (513,707 acres), and atrazine (467,793 acres). (See data in Table 5.4 for SMP pesticides and the pounds of active ingredient applied for each in 1992. Also, see Appendix F for 1992 Commercial Applicator Summaries.)

Figure 5-1 South Dakota Irrigated Land - 1992.



Source: 1992 SD Irrigation Report.

[1] Brand names used are examples only.

Table 5.4 1992 South Dakota Commercial Applicator Spray Report Summary - For Proposed SMP Pesticides Applications.

SMP Pesticides Chemical Name	Example Trade Names	Acres Treated	Pounds AI Applied/Year
Alachlor	Lasso	290,725	794,915
Atrazine	Atrazine	467,793	477,309
Cyanazine	Bladex	258,180	415,228
Metolachlor	Dual	217,055	459,086
Simazine	Princep	880	3,175

Source: SDDA Commercial Applicator Spray Summary Report 1992. (Proposed SMP pesticides are emphasized).

The National Center for Food and Agricultural Policy (NCFAP) collected and organized pesticide use data from several sources. Pesticide use information came from surveys by the National Agricultural Statistics Service, reports from states and selected crops reports from USDA, assessments by USDA, and farmer pesticide use records from California. See Table 5.5 for South Dakota data.

Table 5.5 South Dakota Pesticide Use By Active Ingredient For Proposed SMP Pesticides.

SMP Pesticides Chemical Name	SMP Product	Pounds AI Applied/Year
Alachlor	Lasso	1,019,981
Atrazine	Atrazine	841,644
Cyanazine	Bladex	848,904
Metolachlor	Dual	1,573,627
Simazine	Princep	12,923

Source: National Center for Food and Agricultural Policy, 1992 Report. (Proposed SMP pesticides are emphasized).

The 1995 report entitled Pesticide Use In U.S. Crop Production from NCFAP for the years 1990-93 also lists agricultural pesticide use in South Dakota. It was estimated that South Dakota placed 20th out of 48 states using only 15.7 million pounds of pesticide active ingredients. This is an estimated 1.8% of the total agricultural pesticide applied in the continental United States. Minnesota, Nebraska and Iowa each applied approximately twice as much pesticide active ingredient as did South Dakota. 2,4-D, trifluralin, metolachlor, alachlor, cyanazine, atrazine, dicamba, propachlor, butylate, and glyphosate round out the top ten pesticides applied in South Dakota for this time period. Table 5.6 lists agricultural pesticide active ingredient use in South Dakota.

Frequency and extent of active ingredient use in South Dakota can be found in Table 5.7. Corn acreage, for example, had applications of alachlor 23%, atrazine 27%, cyanazine 14%, and metolachlor 15%. This information is found in the 1992 South Dakota Crop and Livestock Reporter (SDCLR).

Pesticide use on South Dakota's agricultural land, is usually less than in surrounding states, according to the SDASS. In 1992 South Dakota applicators applied herbicide to 92% of the corn acres. In Minnesota and Iowa the corn acres received herbicide on 99% and 98% of

Table 5.6 Pesticide Use By Active Ingredient (1990-1993).

Pesticide	Lbs Active Ingredient Applied/Year	Pesticide	Lbs Active Ingredient Applied/Year
2,4-D	3,104,461	Imazamethabenz	22,398
2,4-DB	1,723	Imazaquin	6,075
Acifluorfen	28,000	Imazethapyr	46,102
Alachlor	1,019,981	Lactofen	4,500
Atrazine	841,644	MCPA	333,949
Bentazon	291,751	***Metolachlor***	1,573,627
Bromoxynil	162,916	Metribuzin	12,063
Butylate	755,000	Metsulfuron	4,675
Chlorimuron-ethyl	1,485	Nicosulfuron	17,856
Clomazone	15,300	Paraquat	40,266
Clopyralid	20,200	Pendimethalin	302,719
Cyanazine	848,904	Picloram	88,572
Dicamba	824,093	Primisulfuron	1,488
Diclofop	55,995	Propachlor	788,500
Diquat	108	Quizalofop	5,625
EPTC	213,467	Sethoxydim	21,892
Ethalfluralin	140,132	***Simazine***	12,923
Fenoxaprop	17,990	Thifensulfuron	5,442
Fluazifop	27,000	Tribenuron	2,821
Glyphosate	502,637	Trifluralin	1,639,147

Source: National Center for Food and Agricultural Policy - 1990-1993 Survey Data. (Proposed SMP pesticides are emphasized).

the corn acres respectively. Soybean acres in South Dakota received a herbicide application on 95% of the planted acres, while in Minnesota and Iowa applicators applied herbicides to 100% of the soybean acres.

5.3 SOILS

South Dakota has many different types of soils. Although there are numerous factors in soil development, the variation in parent material in the state provides for a variety of soil types. The Black Hills hard rock outcropping, sedimentary formations of the plains, and the glacial drift formations in the eastern half of the state are sources of the state's soils.

Table 5.7 Frequency and Extent of Herbicide Active Ingredient Use in South Dakota 1992.

Herbicide	Area Applied %	Total Applied Pounds
WINTER WHEAT		
2,4-D	38	123,000
Metsulfuron-methyl	31	1,000
OTHER WHEAT		
2,4-D	47	428,000
Dicamba	36	79,000
MCPA	17	143,000
CORN		
2,4-D	14	160,000
Alachlor	23	1,047,000
Atrazine	27	827,000
Bromoxynil	10	92,000
Cyanazine	14	850,000
Dicamba	48	562,000
EPTC	14	2,070,000
Metolachlor	15	1,222,000
Nicosulfuron	7	9,000
Propachlor	5	658,000
SOYBEANS		
Bentazon	18	294,000
Chlorimuron-ethyl	11	2,000
Imazethapyr	34	46,000
Thifensulfuron	9	1,000
Trifluralin	61	1,284,000

Source: 1992 S D Crop and Livestock Reporter.
(Proposed SMP pesticides are emphasized).

Soil development is slow in the igneous and metamorphic rocks in the Black Hills area. Soils formed in these materials commonly are quite shallow and contain large amounts of rock fragments. The sedimentary sandstone, siltstone, limestone, and shale formations have produced different soil characteristics. The Pierre Shale, an Upper Cretaceous formation which dominates the land surface in a large area of western South Dakota is the source of easily erodible expansive clays. The sandstone and sandy shale in the northwestern part of the state are the source of several types of soils including sands, sandy loams, clay loams, silty clay loams, silty clays, and clays. Sandstone and siltstone in the southwestern and south central portions of the state weathered to sandy and silty soils, with wind blown sand hills extending north from the Nebraska Sand Hills.

Soils east of the Missouri River are derived from materials that resulted from glacial drift deposits. Glacial deposits can be described as three major groups: till, outwash, and glacial lake deposits. Till is a mixture of clays, silts, sands, and rock fragments and may be intermingled in any proportion. Outwash materials consist mostly of sand and gravel often overlain by alluvium. Soils developed from outwash are loamy or silty over sandy or sandy-skeletal material. Glacial lake deposits consist of bedded silt and clay with some fine sand. Soils developed in the glacial lake deposits range from loamy fine sand to clay.

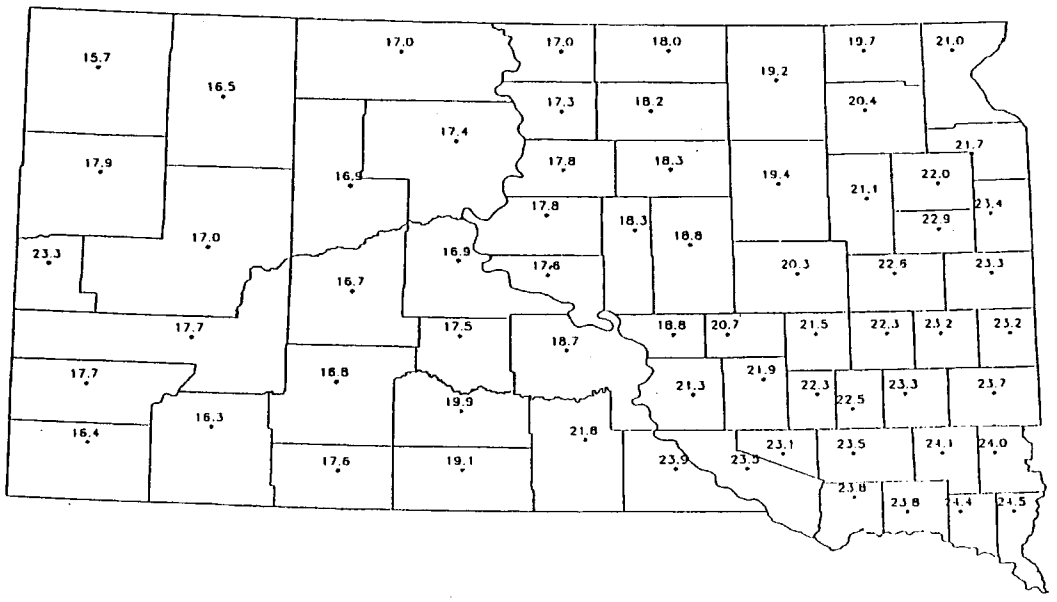
Wind-blown sediments (loess) consisting of silts from western South Dakota mixed with glacial silts are deposited in areas along the Missouri River. Other wind-blown sediments in the eastern part of the state consist of sandy and silty materials. Alluvium consisting of gravel, sand, clay, and silt was deposited by moving water and is found along the major drainage ways in the state. Alluvial soils range from clayey to sandy.

5.4 CLIMATE

South Dakota has a continental-type climate, experiencing rapid fluctuations in temperature with periods of extreme heat in the summer (over 100° F) and cold in the winters (below -20° F). The average annual temperature for the state is 46° F. Average length of the growing season is about 120 days in the northern portions of the state and about 160 days in the southeastern part.

Annual precipitation varies from between 24 and 25 inches in the southeast to less than 14 inches in the northwest. See Figure 5-2 for a map of annual precipitation. Most of the precipitation occurs during the growing season in spring and early summer. Much of the summer precipitation comes from thunderstorms which can be very intense, delivering large amounts of precipitation in a short time. Snowfall averages vary from 30-50 inches in the lower elevations to over 100 inches in the northern Black Hills.

Figure 5-2 Annual Precipitation (in.) 1961 - 1990 Normals.



SOURCE: STATE CLIMATOLAGIST - SDSU.

5.5 NON-AGRICULTURAL PESTICIDE USE

Non-agricultural pesticides (those pesticides not used to produce an agricultural commodity) may consist of pesticides used on forest lands, lawns, golf courses, ornamental trees and shrubs, right of ways, homes, and industrial sites. EPA has estimated that from 20 to 64 million people in the United States apply some form of pesticide to their lawn. If the estimated 8-15 million households that have a commercial lawn company apply pesticides are added, the total increases to 40 percent of the nation's private lawns being treated with a pesticide. South Dakota does not track homeowner use of pesticides. The list of proposed SMP pesticides that appeared in the Federal Register Notice of June 26, 1996 contained pesticides that are used almost exclusively by agricultural users in South Dakota. Until the list is expanded to include pesticides used by the general public, South Dakota will focus its efforts on the higher priority agricultural pesticides.

5.6 APPROACH AND ACTIVITIES TO ASSESS VULNERABILITY OF SOUTH DAKOTA'S GROUND WATER RESOURCES

5.6.1 HYDROGEOLOGY

The assessment of South Dakota's ground water resources has been an ongoing activity in South Dakota for over 100 years. Nearly all of the counties east of the Missouri River have had county-wide reconnaissance-level studies completed by the Geological Survey, a program of the Department of Environment and Natural Resources (DENR), and the United States Geological Survey (USGS). Reports for the county studies are commonly published in two volumes, "Geology" and "Water Resources." Geologic and water resource maps at 1:100,000 scale are available for most of the counties where a study has been completed. The county-wide study reports and maps are the result of geologic mapping, test hole drilling and observation well installation, testing, and monitoring. Test holes were drilled by the Geological Survey Program (GSP) approximately every three miles as part of the county-wide studies.

The GSP has conducted several special assessments to secure water supplies for towns and rural water systems. They have also characterized water resources and the geology for various regions or several-county areas. These studies included test hole drilling, monitoring well installation and sampling, aquifer tests, and the development of conclusions and recommendations for each study.

In addition to the ground water and geologic assessments performed by the GSP and USGS, the DENR Water Rights Program has installed and maintained a network of over 1,600 observation wells. These wells have been used primarily for water level elevation measurements with measurements taken on most of the wells twice monthly through the growing season and monthly or every other month through the winter. Water level information dates back to the mid-1950's, although most of the observation wells were installed in the mid- to late- 1970's. The majority of the observation wells are located in the glaciated region of eastern South Dakota.

Over 32,000 lithologic logs, 3,400 water-quality analyses, and 197,000 water levels have been collected from the county-wide studies, special studies, and the Water Rights' observation well network. These data are stored in computerized databases managed by the Geological Survey and Water Rights Programs and are available to the general public.

Numerous other assessment studies have been conducted by or with funding from federal agencies. These agencies include the Environmental Protection Agency, the USGS, the US Department of Energy, the US Department of Agriculture, and the US Army Corps of Engineers. These assessments have produced geologic and hydrologic maps, estimates of aquifer characteristics, water use data, modeling results, natural resources bibliographies, and resource inventories. Products of the studies include USGS atlases and, geologic quadrangle maps, county soil surveys, summaries of water quality data, water use estimates, domestic well inventories, and other publications.

No formal process of mapping sensitive areas to produce a statewide sensitivity map has been completed. However, determinations of sensitivity have been made by DENR on a site specific basis and on an aquifer basis. A sensitive aquifer consists of water saturated rock, sediment, alluvium, or outwash material through which water can readily move, and has been defined for the purposes of this program as one which occurs at or near the land surface, has thin, permeable overlying materials, and/or does not have a substantial thickness of overlying unweathered geologic materials. Sensitive aquifers may be susceptible to man induced impacts because of their occurrence near the land surface.

The studies mentioned previously in this component have all resulted in maps depicting the aquifers in the state. These maps are used to determine sensitive areas/aquifers based on the above definition of sensitivity. These maps vary in scale from 1:250,000 to 1:24,000. These maps continue to be used as basic sensitivity maps as the state pursues funding to complete the following:

1. A 1:500,000 scale surficial geology map of South Dakota is in preparation by the GSP;

2. Based on existing DENR county aquifer maps, maps depicting surface geology (that are used to make maps depicting sensitive and non-sensitive areas) at a 1:100,000 scale have been produced for most counties where a county study has been completed;

3. The surficial geology of a portion of the state is mapped at a scale of at least 1:100,000. Surficial geology mapping by the GSP is needed in a remaining six counties in eastern South Dakota and some counties in western South Dakota at a 1:100,000 scale; and

4. Using existing hydrogeologic data generated from the county-wide studies and other geologic and hydrologic investigations, the GSP will conduct a pilot project where aquifer boundary mapping will be done based on the surficial geology at a 1:24,000 scale. This will be done to compare the resolution between the larger scale and the 1:100,000 scale to determine if larger scale mapping is necessary.

5.7 FUTURE AND PARTIALLY COMPLETED ASSESSMENT WORK

Future and partially completed assessment activities may include the following:

- County-wide assessments of geologic and water resources in Roberts, Todd and Mellette Counties, other counties west of the Missouri River and several partially completed assessments;
- Continued observation well installation in the Black Hills;
- Black Hills Hydrology Study/Black Hills Water Management Study;
- Installation and sampling of the Statewide Ground Water Quality Monitoring Network;
- Integrating all natural resource data into a state-wide GIS system; and/or
- Expanded commercial and private pesticide use data collection.

5.8 CURRENT AND REASONABLY EXPECTED SOURCES OF DRINKING WATER

Aquifers within South Dakota can be grouped into two categories, unconsolidated sand and gravel aquifers (glacial drift and alluvial), and bedrock aquifers. Glacial aquifers consist of outwash (sand and gravel) deposited by glacial meltwater and occur east of the Missouri River valley. Alluvial aquifers include sand and gravel deposits underlying the major streams and rivers within the state. The glacial and alluvial aquifers are the most abundant and easily accessible sources of ground water for much of the state's population. East of the Missouri River, ground water accounts for about seventy (70) percent of all water used. The water quality within these shallow aquifers is highly variable but is generally suitable for domestic, industrial, and agricultural use.

Deep bedrock aquifers are generally less susceptible to contamination, as they are often overlain by thick clay and shale deposits. The exception is the outcrop areas in the Black Hills. All or portions of some bedrock aquifers such as the Ogallala, and the Arikaree are also susceptible to contamination. Bedrock aquifers are the only source of ground water west of the Missouri River, except for a few small alluvial aquifers along major streams. The bedrock aquifers are used extensively as rural-domestic and stock water supplies and for municipal and industrial use. The majority of the bedrock aquifers are unsuitable for irrigation. Ground water accounts for up to thirty (30) percent of water used in the western part of the state.

South Dakotans are very dependent upon ground water with over 95% of the state's public water supplies serving three-fourths of the state's population. The major sources of ground water for over 30% of the state's population are the shallow glacial aquifers of eastern South Dakota. These shallow glacial aquifers, the bedrock aquifers which crop out in the Black Hills area, and alluvial aquifers which occur throughout the state are the most vulnerable ground water resources in the state. They are vulnerable because they occur in densely populated areas with a high concentration of pollution sources above them, and only thin, overlying materials for protection. In addition to public drinking water uses, ground water is used extensively for irrigation, agricultural uses, commercial and industrial facilities, and domestic uses. The bedrock aquifers in and near the Black Hills, although highly sensitive are not in the Statewide Ground Water Quality Monitoring program and they are not included in Table 5.8. The Black Hills Hydrology Study is addressing these aquifers. This study, when completed, will provide a characterization of ground water quality and quantity in the Black Hills.

Almost 50% of the 453 million gallons of water used daily in South Dakota is ground water. Ground water is highly valued in South Dakota because of the lack of good quality surface water that can presently be distributed for use as drinking water. Only 5% of the public water supplies in the state use surface water. Nearly everyone not supplied by public water systems is dependent upon ground water for domestic use. Ground water supplies over 50% of all the water applied to the land surface for irrigation.

Administrative Rules of South Dakota (ARSD) 74:54:01 classifies all ground water with a total dissolved solids concentration of less than 10,000 parts per million (ppm) as having the beneficial use of drinking water. Ground water quality standards have been set; the standards are based on EPA's maximum contaminant levels for drinking water. All ambient ground water which meets the 10,000 ppm limit for total dissolved solids is to be protected or remediated to meet the ground water quality standards.

5.9 PRIORITIZATION OF AQUIFERS IN SOUTH DAKOTA

South Dakota Codified Law §34A-2-107 requires DENR to prioritize ground water pollution prevention and protection efforts for the state. Prioritization is to be based on ground water quality standards, beneficial uses of water, the extent to which a ground water source supplies or might feasibly supply public water systems or wellhead protection areas, the degree of hazard to public health and welfare, the dependence of local citizens upon ground water supplies, and the vulnerability of ground water supplies to contamination.

To implement the legislative mandate, a resource-based prioritization process was developed based on the potential for contamination and impacts the contamination would have on aquifers or specific portions of aquifers. An aquifer in South Dakota is defined as "a geologic formation, a group of geologic formations, or part of a geologic formation that contains sufficient saturated permeable material to yield quantities of ground water to wells and springs." The following considerations were used to prioritize aquifers or portions of aquifers for the state's protection and planning activities:

- The impacts to public health if the ground water was contaminated;
- The potential of an aquifer/area to be designated as a wellhead protection area;
- The amount of water used or that could be used from an aquifer/area for private and public water supplies and whether there are alternative drinking water supplies;
- The ambient total dissolved solids concentrations (whether it was 10,000 ppm or less);
- The sensitivity of the aquifer/area;
- Any documented water quality problems; and
- Any special considerations (such as connection to surface waters, recharge areas, or high ambient water quality).

It must be noted that delineated and potential wellhead protection areas, are the highest priority areas, regardless of the aquifer or ranking of the aquifer. State cooperators will provide advice and assistance to private well owners regarding the protection of their wells. In places where contamination has been proven every reasonable attempt will be made to afford the same considerations to private wells as is afforded to the Public Water Supply Systems. Minimum wellhead protection areas are recommended for public water supplies in the state wellhead protection program document. Refer to Box 5.1 for aquifer ranking.

Box 5.1
Aquifer Ranking

Highly Sensitive

Whole, or parts of, glacial, alluvial, and bedrock aquifers which essentially occur at the land surface.

Moderately Sensitive

Whole, or parts of, glacial, alluvial, and bedrock aquifers which occur near the land surface and are overlain only with weathered or fractured materials.

Least Sensitive

Whole, or parts of, glacial, alluvial, and bedrock aquifers which are more deeply buried or otherwise buried by an effective confining layer.

5.10 USE OF VULNERABILITY IN THE GENERIC STATE MANAGEMENT PLAN

South Dakota has established a ground-water prioritization process. The process is based on the potential for contamination and the impacts contamination would have on ground water. This process is designed to assess aquifers independent of aquifer size. The following criteria are used to prioritize ground water:

- Areas that will affect public health.
- Wellhead protection areas/public water supplies.
- Private water supplies.
- Ambient water quality with a Total Dissolved Solids value of 10,000 mg/L or less giving it the beneficial use of drinking water.
- Vulnerability
  - * Surficial glacial/alluvial aquifers,
  - * Portions of glacial and bedrock aquifers which exist at or near the land surface,
  - * Intermediate glacial aquifers,
  - * Basal glacial aquifers,
  - * Bedrock aquifers.
- Documented water quality problems.
- Special considerations.

Based on the above criteria, the following ranking for aquifers in South Dakota has been developed:

1. Big Sioux Aquifer;
2. Alluvial aquifers and bedrock aquifer outcrop areas in and around the Black Hills;
3. Parker-Centerville aquifer;
4. All other surficial glacial and alluvial aquifers;
5. Ogallala/Arikaree aquifer;
6. Fox Hills/Hell Creek/Fort Union aquifers;
7. Portions of intermediate and basal glacial and bedrock aquifers where existing at or near the land surface (East of the Missouri River);
8. Intermediate glacial aquifers;
9. Basal glacial aquifers; and
10. Bedrock aquifers.

In addition to DENR's use of the above categorical ranking of aquifers, the ranking was used for prioritizing state ground water research and public education funds. It was also included in the South Dakota Section 319 Nonpoint Source Pollution Management Plan by the Nonpoint Source Task Force.

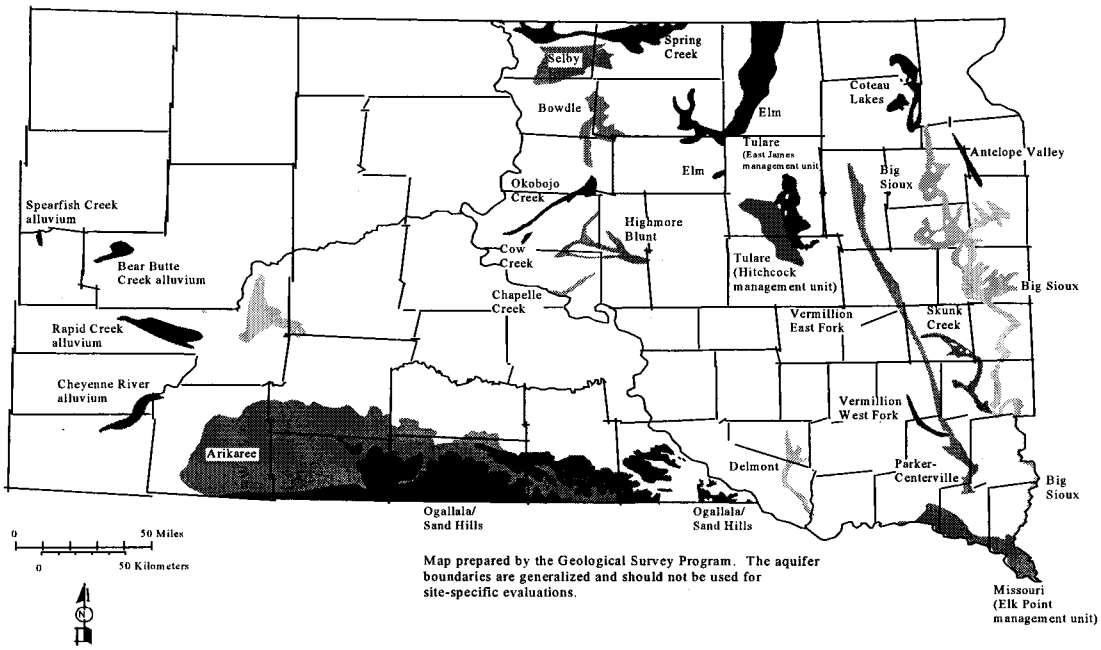
Table 5.8 Aquifer Ranking for the Statewide Monitoring Network.

Aquifer	Aquifer
Big Sioux	Selby
Skunk Creek	Tulare (Hitchcock Management Unit)
Ogallala/Sand Hills	Tulare (East James Management Unit)
Antelope Valley	Delmont
Alluvium - Bear Butte Creek	Elm
Alluvium - Cheyenne River	Arikaree
Alluvium - Rapid Creek	Coteau Lakes
Alluvium - Spearfish Creek	Cow Creek
Missouri (Elk Point Management Unit)	Vermillion West Fork
Vermillion East Fork	Spring Creek
Parker-Centerville	Chapelle Creek
Highmore-Blunt	Okobojo Creek
Bowdle	

Source: Geological Survey Program.

The aquifers included in the highest priority category are listed in Table 5.8 (Aquifer Ranking For The Statewide Ground Water Quality Monitoring Network) and depicted in Figure 5-3 (Aquifers To Be Monitored In The Statewide Ground Water Quality Monitoring Program). The further prioritization of these aquifers has been intended primarily as a planning tool for the installation and incorporation of wells into the network and as a means of budgeting financial, physical, and personnel resources. Each aquifer was ranked numerically based on a subjective prioritization scale which considered sensitivity of the aquifer, land use over the aquifer, other practical sources of water, and the extent of use for drinking water from the aquifer.

Figure 5-3. Aquifers To Be Monitored In The Statewide Ground Water Quality Monitoring Network



Source: Geological Survey Program.

Much work has been done to describe the vulnerability of individual aquifers on a limited site specific basis, such as permitted "point source" facilities. Fate and transport modeling is sometimes required as part of a state permit. A review process may then determine the relative vulnerability of ground water to pollutants of concern from the permitted facility. Vulnerability of ground water in specific aquifers to individual contaminants such as pesticides has not been done.

The SDDA and the East Dakota Water Development District (EDWDD) have completed several county Geographic Information System projects that will provide the State with aquifer vulnerability information down to the sub-county level for SMP pesticides. This cooperative effort began in 1991 with the East Dakota Water Development District and a Clean Water Act, Section 319 project proposal entitled "Implementation of Comprehensive Local Ground Water Protection Measures in the Big Sioux Aquifer Area of Eastern South Dakota". The purpose of this project was stated as to "Facilitate better management for protection of rural and municipal water supplies. This approach utilizes a computerized geographic information system (GIS) which consolidates all available natural resource data in a series of map overlays that allows visual and computerized analysis of the interacting resource layers". The EDWDD, EPA-Region VIII-Ground Water, SDDA, DENR, a local and the state office of the NRCS, SDSU water resource and soil scientists and a local private GIS contractor participated in early project development. This group agreed upon development of different GIS overlays and the specific criteria for digitizing. The SDDA has continued this work and has contracts that meet the criteria for digitizing standards published by the National Cartographic Center of the NRCS. The scale is 1:24,000. The following counties have digitized and attribute data available: Brookings, Codington, Deuel, Hamlin, Minnehaha, Moody, Grant, Lake, Clark, Kingsbury, Miner, Turner, Union, Lincoln, and Clay. This work includes GIS layers and attribute data of soils, shallow aquifers, wellhead protection areas, transportation, and hydrography. The surficial aquifers are delineated, designated with an appropriate map scale and combined with soil characteristics from the

South Dakota, NRCS Technical Guide, Table 1 - Soil Interpretive Groups, Column - Hydrologic Group (A-D), with "A" equaling the most vulnerable and "D" the least vulnerable areas.

Pesticide properties are important factors in determining the fate of pesticides in the environment. Properties that determine if a pesticide will leach to ground water include adsorptivity, degradation rate, solubility, and volatility. Information on these properties will be gathered by SDDA and used along with soil properties and surficial aquifer data in the GIS to help determine the fate of pesticides in the environment.

A pilot project, dealing with the Hayti, South Dakota, 7.5 minute topographic quadrangle map, has been initiated to help SDDA determine what types of information will be needed to make pesticides and ground water vulnerability assessments using GIS information layers. The project is designed to provide SDDA with the necessary information to determine the direction and scope of the GIS layers and attribute data currently being collected. The intent of the project is to determine if cyanazine and atrazine pose significant threats to the aquifer in the Hayti quadrangle under differing climatic conditions, using the following GIS layers: soils, geology/stratification, depth to ground water, surface water/wetlands, land use/farming practices, climatic data, elevation, political boundaries, unconfined aquifer data, well location/well data, land ownership, transportation, vegetation/shelterbelts, ground water monitoring data, and chemical application data. Other prioritized sensitive areas in the state will be mapped as funds, time, and personnel become available.

For the Generic State Management Plan, the aquifer sensitivity information will be used in conjunction with the monitoring data to plan future activities for Chemical Specific State Management Plans. The data collected from the monitoring network and the pesticide use data will be used to develop responses to pesticide detections in ground water using GIS, and any applicable agricultural or ground water computer models (Basins for example), to determine the vulnerability of an aquifer or site specific area. The data will be used to prioritize education and information programs that will bring best management practices information to the applicators and other activities presented in Components 7 and 8 of this document.

COMPONENT SIX
MONITORING

6.1 INTRODUCTION

The Environmental Protection Agency (EPA) has indicated they will allow states to choose a State Management Plan (SMP) ground water monitoring approach most appropriate for their state. The EPA will review a range of activities to determine if a state's monitoring program supports its ground water protection goal, supports and accurately reflects its assessments and priority-setting scheme, and supports the connection between a state's monitoring program and its pollution prevention and response plans. South Dakota's monitoring approach will look at activities that encompass present day water quality, long term trends in water quality, the impact of agricultural chemicals on ground water, pesticide use data, and evaluation of pollution prevention and response measures.

The state has chosen a basic ground water monitoring protocol that includes three monitoring systems: *baseline monitoring* – State-wide monitoring used to measure ground water quality and compare it to known background water quality standards, *detection/response monitoring* – monitoring used to identify suspected areas of contamination and to respond to detections of pesticides found in ground water, and *evaluation or compliance monitoring* – which is used to conduct assessments on the impacts of prevention or response measures on ground water quality. The following discussion describes each of the three monitoring systems and indicates the location of additional information in other components if linkage is necessary. Component 7 (Prevention Actions (7.4-7.5 in general)) and Component 8 (Response to Detections (8.1 specifically and 8.2-8.6 in general)) describe how baseline and detection/response monitoring data will be used to implement appropriate actions to protect the states ground water. Component 9 (Enforcement Mechanisms) uses detection/response monitoring data to support enforcement actions taken as a result of an SMP investigation. Compliance monitoring will be used to evaluate the effectiveness of preventative or remedial actions taken by the state in Component 7 (Prevention Actions (7.4-7.5 in general)) and Component 8 (Response to Detections (8.1 specifically and 8.2-8.6 in general)).

6.2 MONITORING PROGRAM DESCRIPTION

6.2.1 HISTORICAL MONITORING EFFORTS

The first monitoring for pesticides in South Dakota's ground water was initiated in the early 1980's as part of the Oakwood Lakes-Poinsett Rural Clean Water Program project. The project was a 10-year U.S. Department of Agriculture effort to determine the water quality benefits from implementing best management practices. The South Dakota project included the installation and sampling of over 100 monitoring wells for the purpose of evaluating the impacts of conservation tillage, pesticide management and fertilizer management on ground water. Over 1,600 ground water samples from shallow, glacial outwash and alluvial materials were collected and analyzed for commonly used pesticides for over six years. The results of the study, published in the 10-year project report, indicated an absence of widespread pesticide contaminated ground water. Detections of very low concentrations of pesticides were "hit and miss" in the same monitoring well, occurring in one sampling event, but not in subsequent sampling events.

The information collected from the Rural Clean Water Program was used by the Department of Environment and Natural Resources (DENR) when the 1988 South Dakota Legislature directed DENR to address the concern of the potential effects of pesticide and fertilizer use on ground water. The DENR initiated a sampling program to assess the presence of these agricultural chemicals in the ground water in other areas of eastern South Dakota in reaction to the ever-increasing reports of pesticide occurrence from the neighboring states of Minnesota and Iowa.

6.2.2 RECENT MONITORING EFFORTS

The Pesticide and Nitrogen study was initiated in the Parker-Centerville aquifer in 1988. This project was expanded to the Bowdle aquifer in 1989, and was further expanded to the Delmont aquifer in 1992. The Geological Survey Program initiated a water quality monitoring program in 1989 in the Big Sioux aquifer. Monitoring parameters included pesticides (initiated 1991) and nitrates (initiated 1989). The South Dakota Department of Agriculture (SDDA) participated in selecting pesticides for analysis and by providing funding for the analyses of selected pesticides. Sampling continued for the Pesticide and Nitrate studies through 1994 and for the Big Sioux aquifer study through 1993.

The two studies included the installation of 72 monitoring wells at 35 sites in the four glacial outwash and alluvial aquifers. These aquifers were chosen for study due to the sensitivity of the aquifers and the agricultural chemical use over the aquifers. As in the Rural Clean Water Program project, the wells were nested, with the shallowest well screened across or near the water table and the deeper wells screened through discrete intervals of the saturated material. These monitoring wells were constructed specifically for collecting water samples for pesticide and nitrate analysis. Refer below to Figure 6-1 for an example of monitoring well construction. Samples were collected in a manner designed to eliminate the introduction of contaminants to the well, providing an accurate representation of the water quality in the aquifer.

The wells in the Big Sioux aquifer were sampled seasonally, however wells in the other three aquifers were sampled monthly from April or May through October. All of the samples were analyzed for pesticides that were commonly used in the study areas.

Monitoring may be required at sites where chemicals have been released into the environment due to spills. Parties responsible for the releases are required to assess the extent of contamination, remediate the affected areas, and in some cases, monitor the ground water tracking ground water contamination and the effectiveness of clean-up efforts. There are currently fifteen sites where ground water monitoring of this type is required. Sampling is conducted from specially constructed monitoring wells, installed by an environmental consultant, and sampled periodically (either quarterly or semi-annually) for chemicals that have been released.

6.2.3 LONG RANGE SMP MONITORING PLAN

Scope and Objectives - The objectives of the long range SMP monitoring program are to assess: the present water quality; the impact of agricultural chemicals on ground water; and long term trends of water quality, in shallow, sensitive aquifers in South Dakota (refer to Figure 5-3). The five areas of the SMP ground water monitoring plan are:

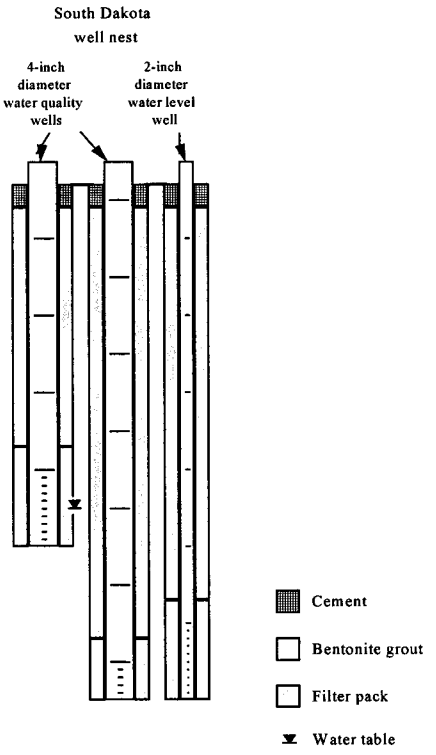
- Establish a permanent statewide ground water quality monitoring network to document existing ground water quality and any changes in ground water quality unrelated to point sources of pollution;
- Intensively monitor (four times per year) the ground water at selected sites in the Parker-Centerville, Bowdle, Delmont, Skunk Creek, Ogallala/Sand Hills, Vermillion West Fork, and Big Sioux aquifers and Alluvium at - Bear Butte Creek, Rapid Creek, and Spearfish Creek. Analyze the samples for commonly used pesticides, ammonia, and nitrate to document any short-term changes in concentrations;
- Annual monitoring will be performed at all permanent monitoring sites;
- Monitor the concentrations of pesticides in ground water at specific sites where pesticides have reached the ground water either from normal use, intentional or accidental spills; and
- Other monitoring could include public water systems and domestic wells. Also, a registrant may be asked to monitor a site(s). This could include special projects monitoring.

Design and Justification - A plan for the development of a permanent statewide ground water quality monitoring network as described above, was developed by a group of hydrologists, geologists, chemists, and engineers within DENR. The plan was implemented in the summer of 1994.

The statewide ground water quality monitoring network plan includes two methods for monitoring ground water: 1) systematic, regular sampling and analysis for organic and inorganic parameters to understand long term water quality changes, and 2) more frequent sampling and analysis to understand the seasonal impact of agricultural chemicals on ground water. The data generated from the network will document existing ground water quality and any changes in water quality in many of the most sensitive aquifers in the state.

The Statewide Ground Water Quality Monitoring Network will consist of specially constructed monitoring wells in the 24 aquifers listed in Component 5 and shown in Figure 5-3. It has taken approximately four years to install the monitoring wells for the initial network, which consists of 145 wells at 80 sites. Wells at most sites were installed as vertically-nested pairs as shown in Figure 6-1.

Figure 6-1. Monitoring Well Examples.



Source: Geological Survey Program.

The 24 aquifers that will be monitored cover areas throughout a large part of South Dakota and are some of the most vulnerable to land surface activities. The state's population uses these aquifers for drinking water.

Most monitoring well sites are located in areas remote from known point sources of contamination. Ideally, each well site uses either existing DENR observation wells or newly constructed 2-inch diameter wells for monitoring the aquifer water level, and two 4-inch diameter wells for collecting samples. Ideally, one of the 4-inch wells will be installed so the well screen intercepts the water table; the other 4-inch diameter well will be screened to intercept an interval of the aquifer below the shallow well (refer to Figure 6-1).

The wells are constructed of schedule 40 polyvinyl chloride (PVC) casing and screens. The casing and screen segments are flush jointed. Clean, well sorted, pre-sacked filter pack was used to cover the screen where native sediments do not collapse and fill the annulus. Bentonite and cement grout were used to seal the well annulus. All wells have locked metal well protectors cemented in place. Well depths range from approximately 10 to 60 feet.

All 4-inch diameter monitoring wells will be equipped with a dedicated submersible pump to avoid cross contamination between the wells during sampling and to maximize sampling efficiency. Water level measurements collected with pressure transducer and data loggers and any other in-situ tests can be taken from the 2-inch diameter well in the well nest that is locked and protected but is not equipped with a dedicated submersible pump. Using the 2-inch diameter wells in this manner protects the integrity of the 4-inch diameter water quality wells.

Monitoring Protocol - There will be two levels of monitoring: 1) systematic, regular sampling and analysis of water from all aquifers shown on Figure 5-3 for organic and inorganic components to document long-term water quality changes (baseline and evaluation monitoring) and 2) more frequent sampling and analysis of water from selected aquifers to document the seasonal impact of agricultural chemicals on the ground water (detection/response monitoring). All monitoring wells will be sampled annually and analyzed for common inorganic parameters including nitrates and pesticides commonly used in the area. Also, 25 wells at 14 sites will be sampled an additional three times between April and October and analyzed for nitrate and pesticides commonly used in the aquifer areas.

Quality Assurance/Quality Control - All of the monitoring will be conducted according to the DENR 106 Ground Water Quality Assurance Project Plan, as approved by EPA Region VIII.

Sampling Methods - Sampling methods are described in the Quality Assurance Project Plan.

Analyte and Analytical Methods - Table 6.1 lists the pesticides currently being analyzed for in each of the aquifers. The analytical methods are also specified. As aquifers are added into the network, selected pesticides used in the aquifer area may be added. Acceptable methods of analysis for those chemicals will be used. As a general rule, pesticides requiring or that are being considered for a SMP, will be included in the statewide monitoring network. However, extremely limited pesticide usage or no pesticide usage in the state will be taken into consideration when designing pesticide sampling projects.

6.3 DATABASE

Most SMP chemical and water level data are entered into DENR's databases. In particular, the pesticide data are stored in an organic water quality database developed by the Geological Survey Program. The database includes analytical data from ground water and surface water samples, date and time of sample collection, sample location, method of sampling, and monitoring well information. As databases are updated, steps will be taken to meet the EPA Minimum Set of Data Elements. See Appendix H for an example sampling sheet. Examples of the information available are provided in the data-encoding and data-output forms found in Appendix H.

6.4 STATEWIDE MONITORING NETWORK UPDATES

6.4.1 FINDINGS

As information on pesticide detections in ground water becomes available, the information will be passed on in a timely manner to SDDA and a Pesticide And Ground Water Advisory Group (PAGWAG) for review. Currently, and in general terms, the health of selected state aquifers is good. The DENR organic water quality data base indicates that from 1988 to 1995, 1,475 ground water samples taken from the Big Sioux, Bowdle, Delmont, and Parker/Centerville aquifers had only 11 pesticide detections (pesticides with a Maximum Contaminant Level (MCL) or Health Advisory (HA)) and only 4.5% had reached or exceeded 25% of the specific MCL or HA for a given pesticide.

Table 6.1 Pesticides Included In The Sample Analysis For Each Aquifer.

Trade Name	Common Name	Alluvium-Bear Butte Creek	Alluvium-Cheyenne River	Alluvium-Rapid Creek	Alluvium-Spearfish Creek	Antelope Valley	Big Sioux	Bowdle	Delmont	Highmore-Blunt
Common Herbicides										
Atrazine	**atrazine***	■	■	■	■	■	■	■	■	■
Desethyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■	■
Desisopropyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■	■
Bladex	**cyanazine***	■	■	■	■	■	■	■	■	■
Dual	**metolachlor***	■	■	■	■	■	■	■	■	■
Eradicane	EPTC					■	■	■		■
Harness/Surpass	acetachlor	■	■	■	■	■	■	■	■	■
Lasso	**alachlor***	■	■	■	■	■	■	■	■	■
Prowl	pendimethalin						■	■	■	
Sencor	metribuzin					■	■			
Sonalan	ethalfluralin					■	■			
Treflan	trifluralin				■	■	■	■	■	■
Princep	**simazine***	■	■	■	■	■	■	■	■	■
Acid Herbicides										
2,4-D	2,4-D	■	■	■	■	■	■	■	■	■
Banvel	dicamba			■	■	■	■	■	■	■
Basagran	bentazon				■		■			
Buctril	bromoxynil						■			
MCPA	MCPA	■				■	■	■		
Tordon	picloram	■	■	■		■	■	■	■	
Organophosphate/ Carbamate Insecticides										
Furadan	carbofuran									
Lorsban	chlorpyrifos									
Parathion	parathion	■	■	■	■			■	■	■

Source: Geological Survey Program.

* Proposed SMP Pesticides

■ - A darkened box indicates the noted pesticide is monitored.

Table 6.1 Pesticides Included In The Sample Analysis For Each Aquifer (Continued).

Trade Name	Common Name	Missouri	Ogallala/ Sand Hills	Parker/ Centerville	Selby	Skunk Creek	Tulare	Vermillion East Fork	Vermillion West Fork
Common Herbicides									
Atrazine	**atrazine***	■	■	■	■	■	■	■	■
Desethyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■
Desisopropyl atrazine	xxxxxxx	■	■	■	■	■	■	■	■
Bladex	**cyanazine***	■	■	■	■	■	■	■	■
Dual	**metolachlor***	■	■	■	■	■	■	■	■
Eradicane	EPTC	■		■		■	■	■	■
Harness/Surpass	acetachlor	■	■	■	■	■	■	■	■
Lasso	**alachlor***	■	■	■	■	■	■	■	■
Prowl	pendimethalin	■		■			■		■
Sencor	metribuzin		■	■		■	■	■	■
Sonalan	ethalfluralin	■	■	■	■	■	■	■	
Treflan	trifluralin	■	■	■	■	■	■	■	■
Princep	**simazine***	■	■	■	■	■	■	■	■
Acid Herbicides									
2,4-D	2,4-D	■	■	■	■	■	■	■	■
Banvel	dicamba	■	■	■	■	■	■	■	■
Basagran	bentazon	■		■		■	■	■	■
Buctril	bromoxynil	■		■		■	■	■	■
MCPA	MCPA		■		■	■	■	■	
Tordon	picloram		■	■		■	■	■	
Organophosphate/ Carbamate Insecticides									
Furadan	carbofuran						■		
Lorsban	chlorpyrifos		■						
Parathion	parathion	■	■	■	■		■	■	

Source: Geological Survey Program.

*Proposed SMP Pesticides

■ - A darkened box indicates the noted pesticide is monitored.

In more site specific terms, Table 6.2 indicates that certain monitoring well locations receive the majority of detections and the higher contaminant values. The Big Sioux aquifer is a good example of this. Factors impacting the ability of the pesticide to leach to ground water may include pesticide chemistry, soil structure, soil organic matter, precipitation, application timing, rate of application and others. The Big Sioux aquifer has (in the case of the five proposed SMP pesticides) 6 to 8 wells that have shown detections of SMP pesticides, while other wells have few or no detections. Well location and well depth along with the above mentioned pesticide and environmental factors plus many other factors may allow the pesticide to show up in the well water sample. More investigation and research, as is indicated by the implementation of this SMP, may be necessary to determine the cause, prevention and/or cleanup of the contamination.

6.5 OTHER MONITORING

6.5.1 SPILL RESPONSE MONITORING

Parties responsible for accidental and intentional releases of pesticides are required to remediate the environmental damage resulting from the incident. If pollutants reach or threaten waters of the state (including ground water), clean-up may be required. Monitoring of ground water may be required to ensure remediation efforts are successful and that there is no off-site migration of the pollutant(s). The vertical and horizontal extent of the contamination is assessed by installing monitoring wells up- and down-gradient and within the contaminant plume. Monitoring frequencies may vary from quarterly to semi-annually. Analytes include whatever was spilled or suspected of spilling at the site. All sampling and analysis must be done according to acceptable standard protocols and laboratory procedures.

Table 6.2 Big Sioux Aquifer Summary Information, August 1991 To August 1995.

	91 (Aug) - 92	1993	94-95 (Aug)
Total number of samples	134*	97**	168***
Total number of pesticide detections, including two atrazine metabolite detections	37	48	50
Number of atrazine metabolite detections	0	6	17
Total number of detections of SMP pesticides	21	32	27
Alachlor detections	0	2	1
Atrazine detections	13	21	26
Cyanazine detections	8	6	0
Metolachlor detections	0	3	0
Simazine detections	NA+	NA	0
Pesticide detections $\geq$ 50% of the MCL or HA			
Alachlor detections	0	0	0
Atrazine detections	0	3	1
Cyanazine detections	4	5	0
Metolachlor detections	0	0	0
Simazine detections	NA	NA	0
Detects $\geq$ the MCL or HA			
Alachlor detections	0	0	0
Atrazine detections	0	1	0
Cyanazine detections	0	4	0
Metolachlor detections	0	0	0
Simazine detections	NA	NA	0
Number of wells sampled	27	27	36
Number of wells with pesticide detections, including two atrazine metabolites	11	8	13
Number of wells with detections of SMP pesticides	**6**	**8**	**8**
Number of wells with atrazine metabolite detections	0	3	5

Source: Geological Survey Program.

+ NA - Not Analyzed. * 2,558 Total Number of Analysis. ** 2,110 Total Number of Analysis.
*** 3,552 Total Number of Analysis.

6.5.2 SAFE DRINKING WATER ACT MONITORING

South Dakota is delegated to administer the Safe Drinking Water Act and is enforcing the monitoring and MCLs for regulated pesticides in public water supplies. The results of this monitoring are available for SMP development and implementation.

6.5.3 FARM WELL PESTICIDE MONITORING

The SDDA collected 708 water samples from 457 private farm wells from 1994 to 1996. See Table 6.3 for a summary of Farm Well Sampling for proposed SMP pesticides.

Table 6.3 Proposed SMP Pesticides, 1994-1996 Farm Well Testing.

Pesticide	Detections	Concentrations (ppb)	Median (ppb)	Reference Point (ppb)
Atrazine	21	0.1-1.6	0.41	3$^{\nabla}$
Alachlor	0	NA**	NA	2$^{\nabla}$
Cyanazine	1	1.30	NA	1+
Metolachlor	1	2.40	NA	70+
Simazine*	0	NA	NA	4$^{\nabla}$

Source: SDDA.

* - Only sampled for in Farm Well Test #2.
**NA - Not Applicable.
ppb - part per billion.
$^{\nabla}$ - Maximum Contaminant Level (MCL).
\+ - Health Advisory (HA).

6.5.4 SURFACE WATER MONITORING

The Water Resources Institute (WRI) is currently working on a report involving surface water monitoring at eleven sites on four rivers in eastern South Dakota. Water samples have been taken from the Big Sioux, Vermillion, James and Missouri Rivers. Surface water samples have been analyzed for twenty-three pesticides and two pesticide metabolites. As the results become available, the data are sent to interested parties. The SDDA, along with other state and federal agencies and a PAGWAG will review this data to determine if pesticides are impacting river systems at levels of significance. These results will be used to determine if Voluntary BMP Education or Specific Regulations should be considered.

6.6 THE USES TO WHICH MONITORING WILL BE APPLIED

Monitoring results for pesticides will be used as an indication of the presence of pesticides in ground water and closely connected surface waters, the frequency at which detections of chemicals occur, the consistency at which pesticides are detected, and the concentrations of specific chemicals. Monitoring results may give a general view of the health of the aquifers and closely connected surface waters and may provide a long-term picture of any trends in water quality, including the frequency and magnitude of pesticide detections.

Only samples containing a verified detection of a SMP pesticide(s) will be considered during SMP investigations[1]. Routine or other, ground water and closely connected surface water samples may be used for purposes other than being used in an official SMP investigation. (Routine or other samples may be used as supporting evidence for initiating an official SMP investigation.)

A monitoring program may provide information such as: baseline water quality, seasonal changes (predictive and evaluation), and long term changes and/or trends (problem identification and evaluation). Systematic, regular monitoring will provide information on long term baseline water quality due to existing pesticide use practices or implementation of new practices. Results from samples drawn more frequently will provide information on short-term, seasonal impacts of agricultural chemicals on the ground water.

When a Pesticide Specific State Management Plan (PSSMP) is required for chemical registration, a monitoring plan can be modified if necessary to include analysis for that pesticide in areas of concern. Monitoring results can be used for preventative actions as described in Component 7 and/or action responses as described in Component 8. (See Components 7 and 8 for more details).

Ground water and surface water monitoring will also be used to identify areas where nonpoint source projects (Section 319 of the Clean Water Act) may be appropriate. It will assist in prioritizing areas in need of wellhead and source water protection programs, and other ground water protection programs.

Monitoring of surface water will continue to provide information to a PAGWAG as to pesticide loadings of surface waters. Surface waters in the state have been found to be hydraulically connected to ground water. Surface water may recharge ground water during high flows and ground water may recharge surface water during times of low flows. Farm well and other domestic well testing will continue to supply needed information to a PAGWAG. Private wells, particularly farm wells, in certain areas of South Dakota have been perceived to be potentially susceptible to pesticide contamination. Many of these wells are located near pesticide application, storage or mixing sites and/or draw from surficial, vulnerable aquifers. Many of these wells are poorly constructed or maintained by current standards, but continue to provide drinking water for rural families.

The gathering and interpretation of pesticide use data and ground water quality data from various sources shall be included in the ground water monitoring program. Dealer records, registrant sales records, commercial applicator spray records and statewide pesticide use record surveys may all be used to help define pesticide use in South Dakota. Data from the Statewide Ground Water Quality Monitoring Program, other DENR programs, South Dakota State University, United States Geological Survey, and SDDA sponsored data collection activities may be used to help define water quality in South Dakota.

The evaluation of the success or failure of pollution prevention and response measures will be incorporated into the pollution prevention and response measure components. These are components seven and eight respectively. Review of both the ground water data and the pesticide use data will be undertaken as it becomes available. If the information indicates that local water quality impairments are very high or increasing, the evaluation would then indicate that increasingly stringent response measures might be necessary.

[1] A verified detection is a detection that is determined to represent the condition of the ground water, leaving no doubt that this compound exists in the ground water. The sample will be a regulatory or specific monitoring well sample.

The South Dakota Department of Agriculture (SMP State Lead Agency) is ultimately responsible for review of data quality. However, an initial review of data will be undertaken by the SDDA Enforcement Agricultural Program Specialist, the SDDA Ground Water Agricultural Program Specialist, and a DENR Natural Resources Engineer. The SDDA and DENR have signed an agreement with EPA (State of South Dakota and U.S. Environmental Protection Agency Multi-Year Agreement (FFY 1998-FFY 2002) Amended FY 2000), establishing a Performance Partnership Grant. This grant establishes core program commitments. Commitments that include assurances that SDDA will maintain an EPA-approved Quality Assurance Program and any required Plan(s) that cover any data collection activities for which SDDA receives funding. The DENR will also continue to obtain EPA approval of Quality Assurance Project Pans for data collection and analysis work for which EPA provides funding.

Laboratories in the state performing SMP pesticide analysis operate with comparable plans and manuals. The South Dakota State Health Laboratory operates under the South Dakota State Health Laboratory Quality Assurance Manual. Modified EPA Method 525.2 is used to analyze for atrazine, simazine, cyanazine, alachlor, and metolachlor in ground water samples. State Health Laboratory procedures dealing with SMP pesticides meet or exceed EPA standards. The Oscar Olson Biochemistry Laboratory operates under a SDDA approved and EPA accepted Quality Assurance Project Plan for SMP pesticide analysis. The Biochemistry Laboratory uses multiclass, multiresidue gas chromatography methodology for SMP pesticide analysis. This methodology is outlined in the EPA Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples. The Water Resources Institute (on the SDSU campus) operates under the Water Pesticide Laboratory Procedures Manual for SMP pesticide analysis. State Management Plan pesticides (alachlor, atrazine, cyanazine, and metolachlor) are analyzed for in water samples at the WRI using EPA Methods 507 and 508.

6.7 PARTIES RESPONSIBLE FOR MONITORING

The SDDA is the lead agency responsible for pesticide use monitoring. This includes monitoring for pesticide impacts on human health and the environment. The DENR is the lead agency responsible for carrying out the monitoring program in ground water. South Dakota State University (SDSU) conducts monitoring of pesticide use, monitoring of selected surface waters for pesticides and occasional ground water pesticide monitoring associated with research projects. Through cooperation, fund pooling, and resource sharing, SMP monitoring will continue to provide the kind of data needed to develop and implement the SMP. The DENR intends to continue construction of monitoring wells, sampling and analysis of water from monitoring network wells, storage of the analytical results, evaluation of the data, and reporting of information. The SDDA intends to provide information necessary on chemical characteristics, use, regulations, data distribution, and other SMP pesticide data needs. SDSU provides pesticide characteristics, pesticide use, and BMP information. The county Cooperative Extension Service agricultural agent will be involved in collecting and distributing information related to SMP development and implementation.

The registrant is responsible for reporting to EPA under section 6-A-2 of the FIFRA, any pesticides found in ground water. The registrant may be required to supply supplemental information to EPA that could require monitoring for a particular pesticide or its metabolites. The registrant may be asked to supply funds to SDDA for the purpose of pesticide monitoring. This may include sampling ground water for the occurrence of pesticides, monitoring the use of pesticides or other monitoring yet to be determined.

Parties responsible for an accidental release to the environment are liable for required clean-ups and for enforcement monitoring. Public water suppliers are responsible for the sampling, analysis, and the reporting of monitoring results required under the federal and state Safe Drinking Water Acts.

State and federal funds have funded the monitoring of pesticide occurrence in ground water to date. Federal funds consist of FIFRA/SDDA and Nonpoint Source Pollution (Section 319) Clean Water Act (CWA) funds. The 1994 State Legislature appropriated $250,000 to initiate the statewide ground water quality monitoring network. It is estimated the cost of operating the statewide monitoring network will be between $160,000 and $190,000 per year. Partial funding for installation of the monitoring network came from a Section 319, CWA grant.

The scope and success of the statewide monitoring program depends on the funding available to continue it. The SDDA and DENR will continue to seek permanent sources of funding that will support the long term monitoring plan that is needed to implement PSSMPs.

7.1 INTRODUCTION

The prevention of ground water contamination from pesticides has been and will continue to be a priority in South Dakota. Existing pollution prevention activities along with a commitment to continuing these activities are cornerstones of the Pesticides and Ground Water State Management Plan (SMP). In the preamble of the Proposed SMP Rule, one of the keys to understanding the Environmental Protection Agency's (EPAs) preventative action philosophy is explained by the following statement: "Prescribing SMPs for individual pesticides fits under EPA's regulatory authority to regulate beneficial but potentially risky substances well before the onset of unreasonable adverse effects". South Dakota Codified Law §34A-2-104 states in part: "that groundwater must be protected, that once groundwater is polluted, it is extremely difficult and expensive to clean up, that both strong enforcement and public education are important and necessary components of the state strategy for minimizing and reducing potential pollution sources, and that effective preventative measures and swift response to releases of pollutants minimize ground water pollution." Both EPA and South Dakota have keyed on the pollution prevention aspect. Both have similarly attempted to limit unreasonable adverse effects to human health and the environment.

Preventative actions may be undertaken in the absence of detections and continued in the event of detections, regardless of the level. At 50% of the reference point, actions of Component 8 are initiated. An established reference point may be a Maximum Contaminant Level (MCL), a Health Advisory (HA) or a South Dakota water quality standard. The EPA has established a reference point for the each of the five proposed SMP pesticides (see Table 6.3 for the proposed SMP pesticides and their respective reference points). The State may establish a more stringent reference point if deemed necessary.

The goal of Component 7 is to prevent contamination, with the specific intent of avoiding reaching a reference point. Both regulatory and non-regulatory strategies developed to this point are described in this document. In order for the State to meet proposed federal SMP requirements some regulatory actions may require future rule development at the state level. The South Dakota Department of Agriculture (SDDA) has an interest in protecting both the State's agriculture and its ground water resources. It is envisioned that this goal will be met by limiting the number and severity of pesticide restrictions in areas of low sensitivity and by placing only such restrictions as are deemed necessary to protect human health and the environment in areas that are sensitive to pesticide leaching. A prevention plan to accomplish this is detailed in this document.

7.2 NON-REGULATORY PREVENTION ACTIVITIES

7.2.1 INFORMATION, EDUCATION, AND PUBLIC OUTREACH

Pesticide user education is the single most important step in South Dakota's prevention strategies and is the foundation for the South Dakota SMP. Current information and future developments related to the protection of ground water is made available to the pesticide user and the public. The following are examples of information, education, and public outreach tools:

- **Informational brochures** - The following are examples of currently available brochures related to pesticide use, storage, and disposal:

    ◊ *Storage and Disposal of Pesticides, Guide for the Homeowner* - This SDDA pamphlet is a general guide for homeowners on storage and disposal of pesticides and cleanup and disposal of flood damaged pesticides.

    ◊ *Pesticide Program* - This brochure is a general guide of the SDDA Pesticide Program and its responsibilities.

◊ *SMP Quick Reference Fact Sheet* - This is a one page description of the SMP process and discusses the background and necessity of the SMP and is published by EPA.

◊ *Pesticide Waste Minimization* - This SDDA informational packet includes recommendations for buying environmentally friendly pesticide packaging, for storage conditions and procedures, and for planning seasonal pesticide purchases to avoid buying more chemical than is needed.

◊ *Pesticide Use, a Guide to the Homeowner* – This is a brochure produced by SDDA providing the homeowner with information on pests and pesticide use. It also provides help in reading and understanding the pesticide label.

- **Periodicals and press releases -** A pesticide newsletter, public service announcements and press releases are used to inform applicators and the general public about proper pesticide use, ground water protection issues, and public hearings on rule changes. In addition to the mass media, the following are examples of publications that are intended for the pesticide user and provide timely updates to pesticide use issues:

◊ *Reg Alert* – This is a publication used by SDDA to inform pesticide dealers of time sensitive material related to pesticides. This includes label issues and the use, handling, transportation, storage and disposal of pesticides.

◊ *South Dakota Pesticide Applicator Update* - This quarterly newsletter is distributed by SDDA to all private and commercial applicators in South Dakota. It contains updates and special interest information in state, local and federal pesticide programs. More than twenty-five thousand newsletters are mailed, approximately each quarter, to applicators and other interested parties.

◊ *Rural Water Quality Newsletter* – This is a CES publication that highlights rural water systems and agricultural management practices. It is designed to affect agricultural profitability, while providing for an adequate supply of high-quality water for future generations.

◊ *South Dakota Farm and Home Research* – This is an Agricultural Experiment Station and SDSU document that for the past several years has included such topics as water quality, site specific agriculture, and agricultural management practices.

◊ *Workshops* - Workshops such as the multi-agency sponsored *Watershed Management Workshop for the James, Vermillion, and Big Sioux Rivers* and the DENR sponsored *Ground Water Quality Conference* bring together the general public and local, state, and federal officials. Workshops present the latest information regarding research and resource protection efforts.

◊ *Localized Mailings* - Specific area targeted mailings may be used by the SDDA to present pesticide-specific information to applicators.

◊ *Public Service Announcements* - This medium is used by many agencies and groups to inform the general public about pesticide issues that may impact ground water.

- **Technical publications**

  ◊ *South Dakota Technical Guide* - This information is designed for use by technically trained persons in the NRCS, other federal agencies, and state agencies. It is also used to assist landowners, land managers, or responsible officials to plan, apply and maintain appropriate conservation practices.

  ◊ *Fertilizer And Pesticide Bulk Facilities Manual* - This manual contains fertilizer and pesticide rules, a guide to pesticide disposal, and a spill response guide. Example bulk storage facility construction criteria for both fertilizer and pesticides are listed in the manual. The main focus of this manual is to assist individuals in constructing storage facilities that protect the environment. This manual is available through the SDDA.

  ◊ *Fact Sheets*

    * The *Cooperative Extension Service* provides a wide variety of information concerning resource protection and agricultural management practices. These technical publications are available to the consumer and deal with a wide variety of subjects including: chemigation, pesticide use, water treatment and drinking water standards. A current list can be found in Appendix L. Copies are available at local CES offices and the CES Bulletin Room.

    * The *South Dakota Department of Agriculture* has also produced several pesticide fact sheets that are designed to provide basic pesticide information to the homeowner, and private and commercial applicators. Information includes pesticide use, safety, and human health and environmental protection information. These publications are listed as follows:

      ° *General Pesticide Safety* - This pesticide fact sheet is a quick reference guide to several major areas of pesticide safety and for prevention of accidental pesticide contamination.

      ° *Granular Application Equipment Calibration* and *Hand Sprayer Equipment Calibration* - These fact sheets target the homeowner and outline several reasons for proper calibration. They provide methods for calibration on small areas and a discussion is provided on how to understand the pesticide label.

      ° *Pesticide Record Keeping* - This fact sheet produced by the National Association of State Departments of Agriculture and USDA, outlines the pesticide record keeping requirements for certified private applicators.

      ° *Pesticide Operational Area Containment Rule* - This is a quick reference guide discussing the Operational Area Containment rule, providing information on the rule that protects the environment from certain pesticide spills.

* *Refereed Publications* - Important sources of research information concerning pesticide properties, how pesticides leach to ground water, how pesticides move in ground water and South Dakota's related geology may be found in refereed publications. Several refereed publications dealing with issues related to pesticides and ground water may be found in Appendix M.

* *University Courses* - Leading edge technical training related to pesticides and/or ground water can be found in South Dakota's state university system. Agricultural water quality related courses are found in Appendix N.

7.2.2 TECHNICAL ASSISTANCE

Technical assistance programs are critical to the success of the SMP. Specific information about how pesticides react in the environment and how best to protect the environment are essential facets of a pesticide specific management plan. Technical assistance is provided to pesticide and water users by several local, state, and federal agencies, private organizations and industry. Technical assistance is provided in many ways including, but not limited to the following:

- **Pesticide Container Recycling** - The SDDA pesticide container recycling program reduces the amount of plastic containers, steel cans, and drums that in the past ended up in landfills and in the environment. Plastic pesticide containers are burned for energy recovery. They are also recycled into pesticide shipping pallets, wood replacement products, speed bumps, agricultural field drain tiles, and hazardous waste drums, thus reducing the risk of pesticide exposure to humans and to the environment.

- **Waste Pesticide Collection Program** - This SDDA program provides collection points and disposal for unusable pesticides, at no cost to the person wishing to dispose of the pesticide. Unusable pesticides are collected and properly disposed of, reducing the risk of pesticide exposure to the environment and human health.

- **Pesticide Handling and Discharge Response Procedure and Plan Methods** - These procedures were designed by SDDA to help dealers and applicators develop written plans for equipment maintenance and pesticide handling to prevent releases from occurring during everyday operations. They provide strategies to protect pesticide applicators, the public, and the environment in the event of a pesticide discharge.

- **Best Management Practice (BMP) Development and Implementation** - There are several sources and delivery mechanisms of this information. A primary source is the South Dakota Technical Guide, which contains information developed by the NRCS. The Technical Guide is a major reference for addressing the top priority resource goals of the 1988-1997 USDA National Program For Soil And Water Conservation. A major goal is the protection of surface and ground water from nonpoint source pollution. A few BMP example categories are:

    ◊ *Integrated Pest Management (IPM) and Integrated Crop Management (ICM)* - These two methods provide specific technical information to producers, applicators, farm managers, and others so that pesticide management decisions are based on best available data.

- ◊ *Buffer Strips* - Buffer strip recognition is already incorporated in some pesticide labels. The South Dakota Conservation Commission has indicated that this is an approved use of its funding for site specific BMPs designed to prevent pesticide contamination of both ground water and surface water.

- ◊ *Abandoned Well Plugging* - An abandoned well may be a direct conduit to an aquifer. It may introduce surface contamination into ground water. Some pesticide labels do not allow mixing, loading or application near an abandoned well. Plugging an abandoned well is also an approved use of Conservation Commission funding.

- **Compliance Assistance** - This SDDA program is designed to enhance compliance with pesticide regulations by utilizing additional methods of providing information and education to the regulated public. Meetings between commercial applicators, private applicators or pesticide dealers and SDDA are specifically designed to provide an opportunity to discuss regulations and provide answers in a non-enforcement type setting.

- **Dealer Sponsored Grower Group Meetings** - Pesticide dealers commonly sponsor meetings for growers. These meetings are a forum for information exchange related to the latest label changes, pesticide specific SMPs, voluntary and mandatory management plans, and farm site assessments.

- **Wellhead Protection Program Development and Implementation** – The DENR and others provide local communities technical assistance to develop and implement voluntary wellhead protection programs. This program is designed to protect public water supplies from potential sources of contamination. Surface areas around wells and wellfields are delineated and potential sources of contamination are identified and managed to prevent contamination of the water supply.

- **Farmstead Assessment System** – FARM-A-SYST was developed for South Dakota farmstead residents by the CES. This point source targeted program is designed to provide the farmstead residents a means of assessing the vulnerability of their domestic water supply to contamination. It will provide them with accurate site specific information and recommendations for practices that may be affecting their ground water. The program investigates the risk of farmstead practices such as pesticide storage and handling. Hazardous waste management is also included. The Field Assessment System and the Homestead Assessment System are currently being developed for South Dakota. There has also been renewed interest from private organizations, such as the South Dakota Cattlemen's Association, to have an independent program that would assist producers in performing on site assessments.

- **Certified Crop Advisors Program** - This program is an essential link for South Dakota to develop and implement BMP, ICM, and IPM programs. The program is designed to establish base standards of knowledge for individuals who advise growers on crop management and production inputs. The program has an exam, provides for continuing education, and operates under a code of ethics. The national exam covers: soils and soil fertility, soil and water management, plant growth and development, and pest management. A State Board establishes standards, administers exams, and provides certification for the Certified Crop Advisors Program.

- **Extension Environmental and Pest Management Programs** - Extension specialists are available in a variety of capacities. They range in expertise from pesticides and specific commodities, to water quality and soil specialists. The 1990 USDA Farm Bill program requires producers to keep records of restricted use pesticide applications.

7.3 REGULATORY PREVENTION ACTIVITIES

Development of Pesticide Specific State Management Plans could require SDDA to develop a State Pesticide Specific Management Plan Rule, if it is determined that voluntary measures are not effective in adequately addressing the prevention goals. Within any given PSSMP, the SDDA may utilize both voluntary and/or mandatory restrictions. If a plan consists only of voluntary provisions, rule development would not be necessary. Any mandatory label requirements or use restrictions (including product cancellation) will require SDDA to develop a rule.

7.3.1 PESTICIDE APPLICATOR CERTIFICATION AND TRAINING

Pesticides and their potential impact on ground water have been incorporated into South Dakota's core certification training manual Applying Pesticides Correctly. Certification meetings are the primary method of instruction for applicators concerning how to safely apply pesticides and provide environmental stewardship.

Private applicators must be certified before they use or purchase a restricted use pesticide. State law requires anyone to be certified before they use any pesticide in the production of an agricultural commodity with the gross sales potential of $1,000 or more on land owned by them. Private applicator certification is valid for 5 years. Most commercial applicators must be licensed and certified. Certification is valid for 2 years and the license is valid for 1 year.

7.3.2 PESTICIDE CONTAINMENT

Bulk pesticides in permanent tanks larger than 300 gallons must be stored within secondary containment to prevent contamination of the environment. Pesticides that are mixed or loaded near or over sensitive areas require secondary containment under certain conditions.

7.3.3 CIVIL PENALTY

Civil penalties for violations of SDCL §38-21 (Agricultural Pesticide Application) and §38-20A (Pesticides) are assessed by the circuit court. However, SDDA may propose a settlement offer according to a penalty matrix. It is a policy of SDDA to allow the respondent an opportunity for a meeting or to otherwise supply information to the department regarding an investigation before SDDA takes formal action. In addition, SDCL §38-20A provides an opportunity for the respondent to present his or her views before a proceeding takes place regarding registrations, misbranding, inspections, or sampling. The Pesticide Enforcement Action Penalty Policy document containing the penalty matrix is in Appendix I.

Alternatives to civil penalties for violations of SDCL §38-21 and §38-20A have been developed to provide the responsible party and the local community the opportunity to use the enforcement process as an educational opportunity. The positive actions of learning more about proper pesticide use and pollution prevention activities, such as construction of catch basins for pesticide equipment parking areas, are seen as viable alternatives to civil penalties.

7.3.4 STATE MANAGEMENT PLAN RESTRICTIONS

Federal restrictions

State Management Plan (SMP) *Restricted Use Pesticide* classification - Restrictions will be placed on the sale and use of certain pesticides due to ground water concerns.

Restricted Use Pesticide (RUP) in the conventional sense - Limits use and sale to certified applicators. Restricted Use Pesticides also entail record keeping and dealer licensing. State Management Plan pesticides may be designated as RUPs by the federal rule making process.

State restrictions

State Restricted-Use Pesticide - SDCL §38-21-39 allows for the State to adopt federal RUP classifications. This law also allows SDDA to classify a pesticide as a State Restricted Use Pesticide.

Restrict The Use Of Certain Pesticides - SDCL §38-21-39 also allows SDDA to restrict the use of certain pesticides or disallow the use of certain pesticides for this state or for designated areas within the state (SMP activities).

7.4 SMP USE CLASSIFICATION

The EPA will designate certain pesticides as SMP pesticides. The State must then develop a Pesticide Specific State Management Plan (PSSMP) in order to continue to use and sell the pesticide in South Dakota. State Management Plan Pesticides will be managed by the details found in the PSSMPs. These PSSMPs then become a part of the pesticide label. The proposed label will state: "For use only in accordance with an EPA-approved State Management Plan for ground water protection. Sale and use are prohibited in States that do not have an EPA-approved State Management Plan." Restrictions placed on these pesticides will be done by State rule.

The trigger for the State to implement prevention actions is based on use of the product in South Dakota. Many of the preventative measures mentioned above are on-going programs and will continue in the event of no detections. On a national level EPA has documented (in the SMP guidance and proposed rule) that in certain localized areas pesticides have leached to ground water and may pose an unreasonable risk to human health and the environment. South Dakota has found, as documented in the Statewide Ground Water Quality Monitoring Network, one atrazine concentration and seven cyanazine concentrations in ground water, greater than the proposed reference points.

This component, "Prevention Actions," considers appropriate measures to prevent pesticide contamination of ground water. If the prevention actions do not prevent detections, then other more stringent preventative actions along with "Actions in Response to Detections" (Component 8) may be implemented. Additional pesticide specific prevention actions are termed "Specific Pesticide Control Measures".

7.4.1 SPECIFIC PESTICIDE CONTROL MEASURES

These actions, depending on the severity of, or trends involved with, the contamination, may range from stepped-up educational efforts to cancellation of the product, under Component 7 - Prevention Actions. A Pesticides and Ground Water Advisory Group (PAGWAG) may consider, but is not limited to, any number of the details found in Box 7.1. They would then provide a recommendation to SDDA on what Specific Pesticide Control Measures to take. The SDDA has the final authority concerning SMP measures and actions.

Box 7.1
Advisory Group Considerations

Extent and frequency of detections
Associated detection trends
Significance of detected concentration
Crop, non-crop use and irrigation use
Current application practices
Pesticide sales and use data, and trends
Precipitation and other weather data
Soils data
Pesticide leaching and other chemical data
Geologic data and hydrogeologic data
Availability of alternative pesticides
Non-chemical alternatives
Environmental practices
Economic impacts
Potential health and environmental impacts
Product toxicity
Monitoring data
Dealer participation
Pesticide statute and rule compliance
Other pertinent issues

Specific Pesticide Control Measures designed under the prevention mode may include voluntary actions, such as a BMP education program, or when necessary, mandatory management practices, rate reductions, mandatory setbacks from wells or other actions. Table 7.1 lists a few types of restrictive management practices that SDDA may choose to pursue, depending on the specific problem encountered. Some Specific Pesticide Control Measures may require rulemaking. Cancellation of a product registration requires a hearing under the provisions of SDCL §1-26 if the registrant requests it.

Table 7.1 Examples of Specific Pesticide Control Measures.

MANAGEMENT PRACTICES	DESCRIPTION
Setback Areas	Buffer zones may be required near surface water, wellheads, springs or other yet to be determined areas to limit application in these sensitive areas.
Restriction To Soil Type	Application of the pesticide may be limited to soil types that limit or restrict pesticide leaching. Considerations may include but are not limited to finer textured soils, high organic matter soils, soils with low permeability and depth to ground water greater than 50 feet.
Application Rate	A lower rate of application may be required where a soil has a low pesticide holding capacity.
Application Method	Methods of application that reduce the potential of a pesticide to leach such as banding application and band placement may be required.
Application Timing	Seasonal changes or yearly limitations in rates may be required.
Site-specific Management Plan	The presence of sensitive areas or chemical composition factors that may lead to leaching, presents a complex situation that will require the SMP advisory group and other experts to make recommendations to SDDA for site-specific restrictions.
Other Restrictions	Additional restrictions may become evident as the investigative process continues. More or more stringent restrictions, such as where a pesticide may be mixed or loaded may be employed.
Cancellation	Pesticide may not be sold or used in a specific area.

7.5 MINIMAL PLAN

Certain low risk situations due to use or use in areas of minimal risk to ground water contamination may justify a "minimal plan". South Dakota would pursue such a plan by using the flexibility already built into the SMP process. A Pesticide Specific Minimal Plan would reference the Generic SMP, account for actual pesticide use (current and previous), and account for pesticide detections in the ground water. A process will be implemented based on the following progression:

- Wide spread minimal use and no detections.
  - ◊ State continues to define pesticide use and potential water quality impairment.
  - ◊ Pesticide use practices, cautions, and all other items normally covered in an SMP are provided for in the current federal label.
  - ◊ State continues to carry out current preventative measures.

- Minimal use plus a detection(s) found in a specific area at a level that warrants site specific PSSMP development. All other areas of the state remain under the minimal plan.
  - ◊ The federal label provides for all areas except those sites that require a site-specific plan. These site-specific areas will be under the control of the developed PSSMP.
  - ◊ The SDDA must assure EPA that it will take appropriate interim action while developing the PSSMP. In the interim the Generic SMP activities would be used.

- Detections of a pesticide are found to be widespread. The State will develop a PSSMP.
  - ◊ PSSMP will be developed for the pesticide consistent with the Generic SMP.
  - ◊ The Generic SMP will be used in the interim as development of the PSSMP progresses.

The state believes this approach will protect the state's ground water from pesticide contamination and allow minor use SMP pesticides to continue to be used without undue burden to the applicators or the state regulatory agencies.

COMPONENT EIGHT
RESPONSE TO DETECTIONS OF PESTICIDES

8.1 INTRODUCTION

Component 7 described actions the State may take to *prevent* pesticides from contaminating ground water. Component 8 includes these prevention actions plus it develops actions the State may take in response to pesticide *detection(s)* in ground water. Public input will be gathered to provide future direction to these actions. Component 8 objectives were developed to ensure that the reference point would not be reached or exceeded. An established reference point may be a Maximum Contaminant Level (MCL), a Health Advisory (HA) or a ground water quality standard. The Environmental Protection Agency (EPA) has an established reference point for the each of the proposed five State Management Plan (SMP) pesticides. The State may establish a more stringent reference point if deemed necessary.

The EPA has oversight of South Dakota's SMP. In the EPA SMP guidance document Appendix A it is stated that if the SMP fails to afford the proper protection of the ground water resource and the State does not correct these deficiencies, then the approval of the SMP may be withdrawn, effectively leading to a prohibition on the legal sale and use of the pesticide in the State. The South Dakota Department of Agriculture (SDDA) will continue to work for South Dakota's agricultural interests in the state, while at the same time taking the necessary actions to protect sensitive ground water areas from pesticide contamination. In stressing prevention as the key element in the SMP process and by encouraging the State's rule process to occur, SDDA is optimistic this flexible Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) program will protect the ground water resources of the state.

In Component 8, approaching or reaching a reference point in a currently used or reasonably expected source of drinking water, or in drinking water that is closely hydrologically connected to surface water, would result in a site investigation. When investigating a pesticide contamination incident involving water the normal timeline for pesticide investigations will be followed. However, if SDDA determines through the investigation that the cause of the contamination may involve a nonpoint source and may also involve the legal use of a pesticide the investigation will operate under the outline listed below, starting in section 8.3. Due to the difficulty in determining the cause of a nonpoint source of contamination several criteria will guide the investigation process. The SDDA will convene an advisory group for the specific pesticide(s), which has been detected. A needs assessment, including a registration benefit review may be completed to determine if additional actions will minimize or reduce further impacts on the water resource. A list of Best Management Practices (BMPs) and other actions (as listed in Table 7.1) may be developed for promotion. The educational process will continue throughout the investigation. Pesticide Specific BMPs and other actions will be promoted. Depending on the outcome of the investigation, development of a Specific Pesticide SMP (SPSMP) rule will be considered by SDDA.

In general the SDDA site investigation may include the help of others on an, as needed basis. The investigation may require the expertise and support of the Cooperative Extension Service, the Department of Environment and Natural Resources, the Natural Resources Conservation Service, South Dakota State University, and the US Geological Survey. Components two and three list the services the agencies are able to support in SMP actions. Depending on the outcome of the investigation, the State could take actions that may lead to implementation of pesticide controls or product cancellation. Component 8 outlines how the State may respond to contamination at or above 50% of the reference point. Reaching or exceeding 50% of the reference point may trigger a site investigation and could result in pesticide controls or response actions, such as implementation of best management practices, use restrictions and/or use prohibitions. As information available to a Pesticides and Ground Water Advisory Group (PAGWAG) and

SDDA indicates local water quality impairments are significant or increasing, responses are expected to become increasingly stringent. The statewide ground water quality monitoring network may help in predicting the potential a pesticide has to leach to ground water. Subsequent laboratory analysis of current sources of drinking water may represent what impact pesticide use has on ground water. The PAGWAG and SDDA will draw conclusions and inferences by incorporating monitoring data of the affected ground water resource with environmental and geological site characteristics, and pesticide use information, along with considering the value of the ground water resource. Finally, SDDA will consider implementation of options within the realm of the SMP (including rule development) based on the above mentioned inferences and conclusions.

The SDDA will take action based on preventing unreasonable adverse effects on the environment, under FIFRA. In part FIFRA states "unreasonable adverse effects on the environment means any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide, or a human dietary risk from residues that result from a use of a pesticide in or on any food inconsistent with the standard."

The following sections in Component 8 are guidelines designed to prescribe an action based on the severity and trends of a problem. By allowing SDDA this flexibility each situation can be dealt with uniquely by encouraging innovative thinking and introducing new technology to deal with any situation which may arise. The SDDA receives its authority to restrict the use of certain pesticides and disallow the use of certain pesticides in the state or for designated areas within the state from SDCL §38-21-39. Many of these actions involve rule development. The following paragraphs discuss actions that may be taken.

8.2 NO VERIFIED DETECTION [1]

- Continue preventative activities as described in Component 7.
- Key on general education and outreach.

8.3 A VERIFIED DETECTION BELOW 50% OF REFERENCE POINT FOUND IN A STATE MONITORING WELL OR A REGULATORY SAMPLE

- A PAGWAG is notified of a verified detection.
- Continue preventative activities as described in Component 7. (See Specific Pesticide Control Measure examples, Table 7.1).
- Best Management Practices (BMPs) are encouraged to be adopted in area(s) of concern.
- Increase public information efforts in same area(s).
- Consider changes in the certification program for pesticide applicators in targeted area(s).
- Provide informational brochures in targeted area(s).
- Continue general pesticide and natural resource education in the area.
- Directed education in localized area of detection will increase.

[1] A verified detection is a detection that is determined to represent the condition of the ground water, leaving no doubt that this compound exists in the ground water. The sample will be a regulatory or specific monitoring well sample.

8.4 A VERIFIED DETECTION AT OR ABOVE 50% BUT BELOW 100% OF THE REFERENCE POINT FOUND IN A STATE MONITORING WELL OR A REGULATORY SAMPLE

The following points are options, and the extent of the State's actions will depend on the level of funding available and the outcome of an investigation. A priority for SDDA and the PAGWAG is to investigate the source of the contamination and offer suggestions for corrective actions.

- Continue preventative activities as described in Component 7. (See Specific Pesticide Control Measure examples, Table 7.1).
- A PAGWAG is notified of a verified detection.
- Investigate to support the verified detection. If the detection has been determined to be a verified detection, SDDA and/or others with available expertise, will conduct an investigation to:
    - ◊ Investigate the source of the pesticide contamination.
        - * If the source is found to be a point source, various regulatory agencies responsible for point source contamination response are advised of the situation and will act according to preexisting law and rule.
        - * If the source is found to be a nonpoint source, attempt to determine the extent of the contamination[2].
    - ◊ Review current pesticide activities in the area surrounding the contamination.
    - ◊ Investigate the existence of historical detections, verified or unverified.
    - ◊ Define a trend of contamination concentration, if a trend exists [3].
- A PAGWAG will review the results of an investigation to determine a geographic area[4] which could be subject to response actions and will provide their findings to the Secretary of Agriculture. Areas that are similar in use patterns, geology, and soil characteristics shall be considered the same when consideration is given to response to detection actions.
- A PAGWAG will then utilize information from the investigation to recommend actions to the SDDA, which may include:
    - ◊ General pesticide and natural resource education in the area.
    - ◊ Directed education in a localized area where detection has occurred.
    - ◊ Directed outreach and awareness programs in the localized area.
    - ◊ Certification changes in the area may be adopted.

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[2] Investigation of the vertical and horizontal extent of contamination is based on laboratory analysis of water samples drawn from monitoring wells (existing or new wells) and public or private water supplies. A PAGWAG will also consider other information that is available to determine the extent of the area affected.

[3] A statistical trend analysis may be conducted on historical data. If, upon review of the data, it is found that the trend is non-significant, it will be defined as undetermined or a stable condition.

[4] The PAGWAG developing the Generic SMP and the SDDA recognize that geographic boundaries need to be easily recognized in order for pesticide users to comply with imposed regulation implemented in a Pesticides and Ground Water State Management Plan. Political boundaries or major landmarks shall delineate these areas.

- ◊ Mitigation of a site specific problem which may include (but are not limited to):
  - * Promote voluntary BMPs.
  - * Modification of use practices.
  - * Actions specific to individual pesticides as provided for in PSSMPs.
- ◊ Special restrictions [5] in a localized area to be determined from information gathered as the result of an investigation or;
- ◊ Dependent on the results of the trend analysis a PAGWAG may recommend:
  - * Expanded directed education in the localized area where detection has occurred.

- Expanded directed outreach and awareness programs in the localized area.
- If SDDA has substantial evidence to suspect an increase in contamination may be realized in the future, monitoring efforts may be increased in areas that possess similar use patterns and vulnerability. Along with this, the geographic extent of the state monitoring network may be expanded to increase understanding of the expanse of pesticide contamination within an aquifer or group of aquifers. Cooperation in this endeavor will be sought from the registrant(s).
- The DENR will alert all Public Water Supply (PWS) systems determined to be within the affected region, of a PAGWAG's SMP findings.
- If no wellhead protection program has been developed, DENR will approach the PWS system(s) to advise and assist the PWS systems to develop a wellhead protection program as provided for in SDCL §34A-3A-17.
- Alert private well owners of the detection and suggest that they have their water supply analyzed for the subject compound(s). Sample results will be voluntarily submitted to local Cooperative Extension Service (CES) agents who will compile information and forward it to the SDDA. Cooperative Extension Service agents and others will provide technical support for private well owners to assist in water supply sampling, laboratory result interpretation and risk analysis.
- If a PAGWAG has substantial evidence to believe that a verified detection is an anomaly and the detected concentration is expected to return to an acceptable level, preventative actions currently enacted will continue. However, the detection shall be recorded and may be used in future actions if subsequent detections are verified.

8.5 A VERIFIED DETECTION AT OR ABOVE 100% OF THE REFERENCE POINT FOUND IN STATE MONITORING WELL OR A REGULATORY SAMPLE.

- Continue preventative activities as described in Component 7. (See Specific Pesticide Control Measure examples listed in Table 7.1).
- A PAGWAG is notified of a verified detection.
- Investigate to support the verified detection. If the detection has been determined to be a verified detection, SDDA and/or others with available expertise, will conduct an investigation to:
  - ◊ Investigate the source of the contamination.
    - * If the source is found to be a point source, various regulatory agencies responsible for point source contamination response are advised of the situation and will act according to preexisting law and rule.
    - * If the source is found to be a nonpoint source, attempt to determine the extent of the contamination.

[5] Special restrictions are restrictions placed on the use of a pesticide and will be defined by a pesticide specific state management plan.

- ◊ Review current pesticide activities in the area surrounding the contamination.
- ◊ Investigate the existence of historical detections, verified or unverified.
- ◊ Define a trend of contamination concentration, if a trend exists.

- A PAGWAG will review the results of an investigation to determine a geographic area which could be subject to response actions and will provide their findings to the Secretary of Agriculture. Areas that are similar in use patterns, hydrogeology, and soil characteristics shall be considered the same when consideration is given to response to detection actions.
- The SDDA may increase monitoring efforts in areas that possess similar pesticide use patterns and vulnerability.
- Options may be employed in an attempt to reduce concentrations to below the reference point, options similar to but not exclusive to Section 8.4.
- The DENR will alert all PWS systems determined to be within the affected region, of a PAGWAG's SMP findings.
- If no wellhead protection program has been developed, DENR will approach the PWS system(s) to advise and assist PWS systems to develop a wellhead protection program as provided for in SDCL §34A-3A-17.
- Alert private well owners of the detection and suggest that they have their water supply analyzed for the subject compound(s). Sample results will be voluntarily submitted to local CES agents who will compile information and forward it to SDDA. Cooperative Extension Service agents and others shall provide technical support for private well owners to assist in water supply sampling, laboratory result interpretation and risk analysis. Clean drinking water may be offered to private well user(s), through registrants or other means.
- If a PAGWAG has substantial evidence to believe that a verified detection is an anomaly and the detected concentration is expected to return to an acceptable level, preventative actions currently enacted will continue. However, the detection shall be recorded and used to make determinations of actions if subsequent detections are verified.

The SDDA will use the results of an investigation to determine the appropriate response and to evaluate if product restrictions or cancellation are necessary to maintain and preserve current and reasonable expected sources of drinking water. A PAGWAG may suggest any means available to mitigate the problem, which SDDA will consider if reasonable and substantial evidence is presented.

8.6 THE CANCELLATION PROCESS

The SDDA receives its authority to restrict the use of certain pesticides and disallow the use of certain pesticides in the state or for designated areas within the state from SDCL §38-21-39. Many of these actions involve rule development.

If cancellation is determined to be the only alternative to preserving currently used and reasonably expected sources of drinking water, or ground water closely hydrologically connected to surface water, the SDDA shall use all available information to determine the extent of the area in which the product is to be canceled. The following are examples of use restriction areas.

- ◊ Small Region (Section)
  - * This area is defined by a restrictive boundary encompassing a small region or a section in which a pesticide has either had restrictions placed on its use or the pesticide use has been canceled.
- ◊ Medium Region (Township)
  - * This area is defined by a restrictive boundary encompassing a medium size region or a township in which a pesticide has either had restrictions placed on its use or the pesticide use has been canceled.
- ◊ Large Region (County or Counties)
  - * This area is defined by a restrictive boundary encompassing a large region or a county (or counties) in which a pesticide has either had restrictions placed on its use or the pesticide use has been canceled.
- ◊ Statewide Restrictions
  - * A pesticide may have its use restricted statewide, by the SDDA.
- ◊ Statewide Cancellation
  - * A pesticide may have its use canceled statewide, by the SDDA.

This same location restriction mechanism may also be used for other SMP label actions.

COMPONENT NINE
ENFORCEMENT MECHANISMS

9.1 INTRODUCTION

Pesticides and Ground Water State Management Plan (SMP) enforcement actions occur at the State level. The authority for enforcement of pesticide and water statutes is described in detail in Component 3, "Agency Legal Authority." The SMP will be designed, implemented and enforced under these authorities. The South Dakota Department of Agriculture's (SDDA's) "Enforcement Action Penalty Policy" is provided in Appendix I.

9.2 ENFORCEMENT

Authority granted pursuant to South Dakota Codified Law §1-26, §38-20A, and §38-21, provides for SDDA to administer and carry out legislative intent related to agency materials inspection, rule making authority, and the regulation and use of pesticides.

Box 9.1
South Dakota Department of Agriculture - Pesticide Regulation

The SDDA is the State lead agency for the Pesticides and Ground Water State Management Plan. Through codified law, rule making authority, policy, Memorandums of Understanding, the State/Environmental Protection Agency Multi-Year Agreement, and the Cooperative Enforcement Agreement of 1985, SDDA has primacy over and regulates the use, sale, distribution, transportation, handling, storage, registration and disposal of pesticides in South Dakota.

Data gathered from monitoring activities (Component 6), will be carefully reviewed in a timely fashion by a Pesticides and Ground Water Advisory Group and SDDA. Significant investigative findings will prompt implementation of the actions outlined in Components 7 and 8, (including when the State will inform the general public and private well owners of a verified detection). The SMP will deal with ground water contamination originating from the legal use of SMP pesticides. Other contaminant findings impacting state agency programs such as the Federal Insecticide, Fungicide, and Rodenticide Act, the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act, and the Comprehensive Emergency Response, Compensation and Recovery Act will be addressed by the appropriate state agency (see program descriptions and authorities in Components 2 and 3).

Ground water monitoring, pesticide monitoring and other monitoring (such as surface water, spills, etc.), and complaints will drive the actions listed and described in Components 7 and 8. Actions range from voluntary actions to mandatory actions (including possible pesticide cancellation). The SDDA will implement enforcement mechanisms when there is a SMP label violation.

The SDDA investigations resulting in an enforcement action(s) for a SMP label violation(s) will provide the respondent an opportunity to reply to the charges by telephone, by letter or in a meeting with the department. Such opportunities offer the respondent a chance to present new information, clarify and defend actions or information related to the enforcement action. All other actions taken by state or federal agencies will be under current enforcement authorities.

COMPONENT TEN
PUBLIC AWARENESS AND PARTICIPATION

10.1 INTRODUCTION

The following component discusses how the public will be involved in the development of the Pesticide Specific State Management Plans, how they were involved in the development of the Generic State Management Plan, how they will be informed of significant State Management Plan (SMP) implementation activities and how they will be informed of pesticide detections. This section also discusses the Administrative Record requirements necessary for the Environmental Protection Agency's (EPA's) documentation of the public's involvement in the SMP process.

10.2 NOTICE OF PROPOSED RULEMAKING

State Management Plan development will include agency and public participation. South Dakota Codified Law (SDCL) provides a procedure for proposed rulemaking and for administering regulations when SMP pesticides warrant it through actions taken in Components 7 and 8. This includes adopting, amending or repealing rules. The following sections of law apply to SMP rule development:

SDCL §38-21-51. Administration and enforcement of chapter – Regulations.

The secretary of agriculture may establish rules promulgated pursuant to chapter 1-26 concerning:
(1) The inspection of storage and disposal areas;
(2) The inspection of application equipment and equipment storage areas;
(3) The establishment of restricted pesticide uses or methods of distribution;
(4) Standards for the transportation, storage and disposal of pesticides or pesticide containers;
(5) The reporting of pesticide accidents and incidents;
(6) Standards for the certification of applicators of pesticides;
(7) Standards for the examination and testing of applicators of pesticides;
(8) The establishment of fees for private applicator certification not to exceed five dollars per certification;
(9) Pesticide applicator reporting and record keeping requirements;
(10) The establishment of state restricted use pesticides for designated areas within the state;
(11) Pesticide dealers reporting and record keeping requirements;
(12) The establishment of certification categories and sub-categories;
(13) The classification or sub-classification of certificates or licenses; and
(14) The use of pesticides through irrigation systems.

SDCL §34A-2-18. Procedure for establishment of classification, standards or rules.

Before waters are classified or standards established or modified, or rules made, revoked or modified, the board shall follow the procedures established by chapter 1-26.

SDCL §1-26-4. Notice, service and hearing required for adoption of rules - Service on interim committee.

The following procedure shall be complied with prior to the adoption, amendment, or repeal of any rule, except an emergency rule:

(1) An agency shall serve a copy of a proposed rule and any publication described in §1-26-6.6 upon the departmental secretary, bureau commissioner, or constitutional officer of the department to which it is attached;

(2) Fifteen days after the service required by subdivision (1) or upon receiving the written approval of that officer to proceed, whichever comes first, and twenty days before the hearing, the agency shall serve the director with a copy of the proposed rules, a copy of any publication described in §1-26-6.6, a copy of the fiscal note described in §1-26-4.2, and a copy of the notice of hearing required by §1-26-4.1. Also, twenty days before the hearing, the agency shall serve the Bureau of Finance and Management with a copy of the proposed rules, a copy of the fiscal note described in §1-26-4.2, and a copy of the notice of hearing required by §1-26-4.1;

(3) The agency shall publish the notice of hearing in the manner prescribed by §1-26-4.1, at least twenty days before the hearing;

(4) The agency shall afford all interested persons reasonable opportunity to submit data, opinions, or arguments, either orally or in writing, or both, at a hearing held for that purpose. The hearing may be continued from time to time until its business has been completed. The agency shall keep minutes of the hearing. A majority of the members of any board or commission authorized to pass rules must be present during the course of the hearing required by this subdivision;

(5) For a period of ten days after the hearing, the agency shall accept written comments regarding the proposed rule, unless the entity promulgating the rule is a part-time citizen board, commission, committee, task force, or other multiperson decision maker, in which case the record of written comments shall be closed at the conclusion of the public hearing. However, the hearing may be specifically continued for the purpose of taking additional comments;

(6) After the written comment period, the agency shall fully consider all written and oral submissions regarding the proposed rule. A proposed rule may be modified or amended at this time to include or exclude matters which were described in the notice of hearing;

(7) The agency shall make any corrections required by the director; and

(8) The agency shall serve the minutes of the hearing, a complete record of written comments, and a corrected copy of the rules on the members of the Interim Rules Review Committee.

The time periods specified in this section may be extended by the agency.

SDCL §1-26-4.1. Notice of proposed rule - Methods and places of publication.

Any notice required by this chapter of SDCL will be published in a manner selected to notify persons likely to be affected by the proposed rule. Publication of a notice as a display advertisement in at least three newspapers of general circulation in different parts of the state shall be construed as compliance by the agency with the requirements for publication. The provisions of chapter 17-2 of SDCL do not apply to notices required by this section.

Notices of hearings and notices of intention to adopt emergency rules shall be mailed to all persons who have made timely requests of the agency for advance notice of its rule-making proceedings. A notice of hearing or a notice of intent to adopt emergency rules shall contain a narrative description of the effect of the proposed rule and the reasons for adopting the proposed rule. A notice of hearing shall also state where and when the hearing will be held, how data, opinions and arguments may be presented by persons unable to attend the hearing, and how the public may obtain copies of the proposed rule.

10.3 Public Role In Pesticide Specific SMP Development

The state will meet with the general public in at least three locations to discuss the Pesticide Specific State Management Plan (PSSMP) document. The purpose of the meetings will be to gather public comment on the PSSMP. Notification of the meetings will occur by announcements through radio, newspapers, and direct mailings to interested parties.

The information received will be reviewed by SDDA. Any and all items deemed applicable and appropriate will be incorporated into the PSSMP. The PSSMP will also be presented to the Nonpoint Source Task Force membership for comment. The plan will be forwarded to EPA Region VIII for approval. Components two and ten explain how the public will be involved in the review and reevaluation of the PSSMP. Discussion of SMPs has to date been with pesticide applicators during recertification meetings, in the Pesticide Applicator Update Newsletter, over the radio on Dakota Farm Talk and on several occasions with the Nonpoint Source Task Force membership.

10.4 Notification Of Detections and Public Water Supply Violations

The SDDA will work cooperatively to disseminate information on all pesticide detections through agricultural chemical dealers, the Cooperative Extension Service, the Department of Environment and Natural Resources, television, radio, newspaper, and direct mailings to the public and the registrant. During specific investigations, farm well water sample results are routinely reported back to the well owner by the SDDA through direct mailing and telephone conversations. Also, the Safe Drinking Water Act Amendments of 1996 under 42 U.S.C §300 et seq. section 114 - Public Notification - requires an owner or operator of a public water supply system to report violations to persons served by the public water system.

COMPONENT ELEVEN
INFORMATION DISSEMINATION

11.1 INTRODUCTION

The pesticide applicator is ultimately responsible for the correct use of the pesticide. Information regarding the measures outlined in a Pesticides and Ground Water State Management Plan (SMP) must be communicated to the pesticide user, industry groups, and regulatory officials. Also, consumers of the water resource are entitled to receive information on the quality of the water that they use. This component describes how ground water resource protection responsibilities and water quality information will be disseminated relative to the SMP.

11.2 INFORMATION DISSEMINATION

The South Dakota Department of Agriculture's (SDDA's) Pesticide Applicator Update is distributed to all commercial licensed and private certified applicators in the state (more than 25,000). All licensed pesticide dealers in the state will receive information through SDDA's "Regulatory Alert" bulletin. This document is specifically designed to provide pesticide information to dealers on very short notice (one to two days), and is currently used to provide dealers with the latest information concerning pesticides. Applicators, the general public, and other agencies can now quickly interact with SDDA on such issues as regulations, permits, and general pesticide questions through the SDDA web site. Registrants will be encouraged to disseminate information at the time a pesticide sale takes place and at applicator and dealer training meetings. News releases will be used to provide the public with information relevant to SMP issues. Component 10 discusses how the public will be involved in the rulemaking process for SMP development and also includes methods of information distribution concerning pesticide detections. If it is necessary to protect public health in a specific area, a direct mailing would be used to notify them. Local newspapers, Cooperative Extension Service (CES) newsletters, public meetings, and radio are just a few of the other methods that may be used to inform the consumer of water quality changes.

11.3 TRAINING

Certification meetings will update licensed applicators every two years and certified (private) applicators every five years. Many of the applicators (including most Natural Resources Conservation Service personnel) attend each year to ensure they have the latest information. A change to yearly certification may be considered, if necessary. In areas of ground water concern, certification meetings will target specific pesticide and ground water pollution prevention information. Training of the applicators is achieved through a SDDA contract with the CES. The SDDA has provided information at training sessions on state rule changes. Components 7 and 8 of this document provide further details concerning SMP education and information dissemination.

COMPONENT TWELVE
RECORDS AND REPORTING

12.1 INTRODUCTION

The reporting requirements for State Management Plans (SMPs) are intended to allow the Environmental Protection Agency (EPA) to assess the implementation and effectiveness of the State's prevention and response measures. South Dakota will continue to make all pertinent SMP information available to EPA.

12.2 RECORDS

Nonpoint and point source pollution information is currently being assembled to develop and implement the SMP. These data are being gathered to set a base line for the state in the areas of pesticide monitoring and sample analysis. State agency data is available to EPA, upon written request. Data from other agencies will be added as appropriate. Box 12.1 contains references to agency data that are currently available to EPA and the general public.

Box 12.1
Data Available For SMP Use

DATA	AGENCY
Enforcement Actions - pesticides	SDDA[1]
Enforcement Actions - ground water	DENR
Permits - pesticide facility, operational area, secondary containment, pesticide registration	SDDA
Permits - ground water discharge data	DENR
Pesticide Certification, Pesticide License	SDDA
Commercial Applicator Pesticide Use Summary	SDDA
Public Drinking Water Testing	DENR
Private Drinking Water Testing	SDDA, DENR
Ambient Water Quality Assessment	DENR, USGS
WATSTORE - ground water site inventory	USGS
Other Ground Water Data - ground water quality data, lithologic logs, water level data	DENR
Farm Bill - program participant numbers	NRCS
Irrigation Permits/Chemigation Use	DENR

12.3 REPORTING

The South Dakota Department of Agriculture (SDDA) will submit a year-end report to EPA as part of its normal programmatic activities. A Biennial Report will also be sent to EPA outlining program evaluation and an environmental evaluation for the Pesticide Specific State Management Plans. Information provided will document formal actions taken by South Dakota detailing ground water and pesticide activities. This will include, but not be limited to, the actions taken as described in Components 7, 8, and 9 of this document.

[1] All SDDA records will be maintained for four years.

APPENDIX A

STATE MANAGEMENT PLAN STAKEHOLDERS

GOVERNMENT

∇ FEDERAL GOVERNMENT

- ENVIRONMENTAL PROTECTION AGENCY

  * Office of Pesticide Programs
    Field Operations Division
    7506C
    401 M Street SW
    Washington DC 20460
    703-305-7410

  * Region VIII
    Toxic Substances Branch
    One Denver Place
    999 18th St Suite 500
    Denver CO 80202-2405
    EPA Technical Advisor 303-312-6242

- UNITED STATES DEPARTMENT OF AGRICULTURE

  * Consolidated Farm Services

    Federal Building
    200 4th St SW
    Huron SD 57350
    Director 605-352-1200

  * Agricultural Marketing Services

    3528 S Western Ave
    PO Box 5069
    Sioux Falls SD 57117-5068
    Director 605-330-4235

  * Natural Resources Conservation Service

    Federal Building
    200 4th St SW
    Huron SD 57350
    State Conservationist 605-352-1200

  * Cooperative Extension Service (See State Government)

- UNITED STATES DEPARTMENT OF INTERIOR

  * United States Geological Survey

    1608 Mt. View Road
    Rapid City SD 57702
    Water Resource Division 605-355-4560

  * United States Fish and Wildlife Service

    Box 986
    420 South Garfield
    Pierre SD 57501
    Director 605-224-8693

  * United States Bureau Of Reclamation

    810 W 5th St
    PO Box 1238
    Pierre SD 57501
    Chief 605-224-6351

∇ STATE GOVERNMENT

- SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

  * Division Of Agricultural Services

    523 E Capitol
    Pierre SD 57501-3182
    Administrator - Office of Agronomy Services 605-773-4432

  * Division Of Resource Conservation and Forestry

    523 E Capitol
    Pierre SD 57501-3182
    Director 605-773-3623

- SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

  * Ground Water Quality Program
  * Drinking Water Program
  * Waste Management Program
  * Water Rights Program

    523 E Capitol
    Pierre SD 57501
    Director - Environmental Services 605-773-3153

  * Geological Survey Program

    414 E Clark St
    Vermillion SD 57069
    Program Administrator 605-677-5227

- SOUTH DAKOTA BOARD OF REGENTS

  * South Dakota State University

    Plant Science Department
    PO Box 2207A
    Brookings SD 57007
    Director - Plant Science 605-688-5121

  * South Dakota Agricultural Experiment Station

    PO Box 2207D
    Brookings SD 57007-0093
    Director - Agricultural Experiment Station 605-688-4149

  * Cooperative Extension Service

    PO Box 2207D
    Brookings SD 57007-0093
    Director - Cooperative Extension Service 605-688-4147

- SOUTH DAKOTA DEPARTMENT OF HEALTH

  * South Dakota Department of Health

    Health Protection
    600 E Capitol
    Pierre SD 57501-2536
    Director 605-773-3368

- SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

  * SD Department of Game, Fish and Parks

    523 East Capitol
    Pierre SD 57501
    Secretary 605-773-3391

- LABORATORY

  * Oscar E. Olson Biochemistry Laboratory

    South Dakota State University
    PO Box 2170
    Brookings SD 57007-0217
    Laboratory Coordinator 605-688-5466

  * South Dakota State Health Laboratory

    500 E Capitol
    Pierre SD 57501
    Water Laboratory Coordinator 605- 773-3368

  * Water Resources Institute

    Water Quality Laboratory
    South Dakota State University
    PO Box 2120
    Brookings SD 57007
    Laboratory Coordinator 605-688-4910

  * Northern Great Plains

    Water Resources Center
    South Dakota State University
    PO Box 2219
    Brookings SD 57007
    Director 605-688-6307

∇ LOCAL BRANCHES OF GOVERNMENT

Local branches of government with agricultural and ground water protection zoning ordinances are encouraged to participate in the SMP process.

OTHER STAKEHOLDERS

∇ REGISTRANTS AND DEALERS

- Registrants with sales of SMP pesticides in South Dakota are encouraged to participate in the SMP process.
- Dealers with sales of SMP pesticides in South Dakota are encouraged to actively participate in the SMP process.

∇ TRIBES

Several Tribes have indicated they may develop Tribal Management Plans (TMP). They may also be interested in exchanging of technical information with the State. The following Tribes have received some EPA funding for Generic TMP development:

- Cheyenne River Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe

∇ GROUPS, ASSOCIATIONS, COMMISSIONS, ETC.

- South Dakota Corn Growers Association
- South Dakota Soybean Association
- South Dakota Oil Seeds Council
- South Dakota Fertilizer and Ag Chemical Association
- South Dakota Wheat Commission
- South Dakota Association of Agricultural Cooperatives
- South Dakota Crop Improvement Association
- South Dakota Irrigators Association
- South Dakota Aerial Applicators Association
- South Dakota Farm Bureau Federation
- South Dakota Farmers Union
- South Dakota Association of Soil Scientists
- South Dakota State Horticultural Society
- Lakes and Streams Association
- South Dakotas Water Congress
- Water Development Districts
- Dakota Rural Action
- South Dakota Wildlife Federation
- South Dakota Municipal League
- South Dakota Association of Rural Water Systems
- South Dakota Association of County Commissioners
- League of Women Voters
- Izaak Walton League of America, Inc.
- Audubon Society
- Sierra Club

APPENDIX B

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

AND

THE SOUTH DAKOTA DEPARTMENT OF

ENVIRONMENT AND NATURAL RESOURCES

IN REGARD TO COOPERATIVE EFFORTS

FOR ENVIRONMENTAL PROTECTION

WHEREAS, the protection of the environment and natural resources is an important mission of the State of South Dakota, the South Dakota Department of Agriculture and the South Dakota Department of Environment and Natural Resources; and

WHEREAS, the economy of South Dakota is more dependent on agriculture then any other State in the Union; and

WHEREAS, it is in the best interest of all citizens of South Dakota to protect the environment and natural resources of this State; and

WHEREAS, the South Dakota Department of Agriculture and the South Dakota Department of Environment and Natural Resources wish to cooperate to the greatest extent possible for the protection of the environment and natural resources of this state and to provide consistent and efficient administration of rules, procedures, and policies; and

WHEREAS, the South Dakota Department of Agriculture and the South Dakota Department of Environment and Natural Resources recognize that both possess human, technological, informational, and material resources that may be applied to serve the mutual benefit of both agencies insuring that duplication of efforts does not occur; and

NOW THEREFORE, this mutual understanding is hereby reached and entered into between the South Dakota Department of Agriculture and the South Dakota Department of Environment and Natural Resources regarding the protection of the environment and natural resources of this State.

THE FOLLOWING IS MUTUALLY UNDERSTOOD:

PESTICIDE AND FERTILIZER MANAGEMENT

The South Dakota Department of Agriculture (SDDA) is the lead agency for the regulation of pesticides and fertilizers including but not limited to chemical registration and distribution, proper use, applicator certification and licensing, as well as all aspects of use of these chemicals including application restrictions, transporting, storing, disposal and handling, for the purpose of preventing injury to humans, vegetation, crops, livestock, wildlife, soil, beneficial insects, groundwater or surface water as it relates to the Federal, Insecticide, Fungicide, and Rodenticide Act as Amended (FIFRA) and state pesticide and fertilizer laws.

The South Dakota Department of Environment and Natural Resources (SDDENR) is the lead agency for response to, planning for and corrective action of regulated substance discharges. SDDA will provide technical assistance in response to, planning for and corrective action of pesticide and fertilizer discharges.

Each agency will immediately notify the other upon receipt of a report of a suspected fertilizer or pesticide discharge and again when information is received that confirms a discharge. Investigation reports are made available to each department.

It is expected that questions regarding proper disposition of pesticides and fertilizers during discharge corrective actions will require mutual decision making between both departments. SDDA will determine if spilled fertilizer or pesticide materials are usable in accordance with fertilizer or pesticide laws. If the material is considered waste, SDDENR will determine the type of waste and will approve of disposal alternatives. Those portions of pesticide or fertilizer discharge corrective action plans that pertain to use of recovered materials will be referred to SDDA for approval based on pesticide and fertilizer laws.

SDDENR will notify SDDA of proposed fertilizer and pesticide corrective actions and will take SDDA comments into consideration before notifying the responsible party of additional monitoring, further corrective action or case closure.

SDDA inspectors will be aware of other SDDENR statutes and report suspected violations to SDDENR. SDDENR staff will be aware of SDDA statutes and report suspected violations to SDDA. On an annual basis, a meeting will be held to discuss each agency's activities, in order to foster this

awareness.

SDDA will inform SDDENR of activities, policies, and potential developments that may affect SDDENR programs and will consider SDDENR comments before actions or policies are put into place.

SDDENR will inform SDDA of activities, policies, and potential developments that may affect SDDA programs and will consider SDDA comments before actions or policies are put into place.

WELLHEAD PROTECTION

SDDENR is the lead agency in the development and implementation of the wellhead protection program (WHP), and the support of local government efforts to develop plans and controls for protection of their groundwater resources, subject to SDDENR concurrence. When local WHP programs propose to restrict the management, use and handling of pesticides and fertilizers as a part of managing their wellhead protection areas, SDDA will be notified by SDDENR. SDDENR will notify the entity managing the local WHP program that SDDENR can fully concur with the local WHP program only if restrictions have been adopted by SDDA pursuant to authority under SDCL 39-19 and 39-21 to accomplish the goals of the local WHP program. (This does not apply to the siting of new fertilizer and pesticide facilities.)

RULE DEVELOPMENT

Each agency will invite the other agency's comments during administrative rule development that establishes rules and standards for pesticides and fertilizers in the environment, pesticide and fertilizer storage, and practices affecting non-point or point source pollution control. Each agency recognizes that independent agency comments should be part of administrative hearing processes.

FERTILIZER AND PESTICIDE MANAGEMENT PLANS AND VULNERABILITY MAPPING

In conjunction with SDDA, state universities, and other interested parties, the secretary (of SDDENR) shall annually review new studies and data that relate to the relationships between fertilizer and pesticide use practices and the quality of waters of the State. From this review, the State shall formulate and revise as necessary State management plans for the use of fertilizers and pesticides that are based on protecting

water quality and preventing groundwater pollution. These management plans will be based on use practices within the State as a whole or in specific areas within the State depending on hydrogeological differences, and shall be used by the state in regulating fertilizers and pesticides pursuant to chapters 38-19, 38-20A and 38-21 in developing future contingency plans, and in performing public education. State management plans will be cosigned by the secretaries before implementation.

PESTICIDE OR FERTILIZER SPILL DATABASE, MONITORING NETWORKS, AND INFORMATION EXCHANGE

SDDA and SDDENR jointly recognize that sharing information will allow each agency to more effectively manage their respective programs. Designated staff from each agency will meet regularly to coordinate and develop common computer software systems and equipment to make information access easier. Each Department will annually identify all of their respective data systems that pertain to agriculture and the environment and make them known to the designated staff to work out plans for sharing the data. Such information will at a minimum involve, environmental monitoring network data, regulated facility data, and geographical information systems. SDDA and SDDENR will examine methods to streamline data gathering for input into the data management systems.

Information exchange procedures will be explored for reports or inspections that indicate a pesticide or fertilizer release has occurred or is suspected, reports of non-compliance and reports of potential or pending enforcement actions.

Copies of SDDA pesticide or fertilizer spill reports and reports of analysis of samples taken during investigations are supplied to SDDENR. SDDENR will supply copies of reports by their staff regarding pesticide or fertilizer incidents to the SDDA. Each agency will pay particular attention to the confidentiality of reports given to the other agency.

CHEMIGATION

SDDENR will share with SDDA any information collected concerning chemigation. Data collected by SDDENR which will be available for review by SDDA includes a database of persons who chemigate and the annual chemigation report.

The SDDA will share information received regarding performance standards of chemigation equipment and devices for use by the SDDENR chief engineer and the Water

Management Board.

QUALIFICATION OF WATER PERMITS

SDDENR will inform SDDA of proposed qualifications that pertain to chemical application, land use, and crop management developed to protect the waters of the State. SDDA may participate in the reviewing and drafting of these qualifications.

AMENDMENTS

Amendments to this Memorandum Of Understanding may be proposed at any time by either party, and amendments shall become effective after written approval by both parties.

TERMINATION

This agreement shall become effective when signed by authorized representatives of the South Dakota Department of Agriculture and the South Dakota Department of Environment and Natural Resources, and shall continue in force unless formally terminated by either party after sixty (60) days written notice.

AUTHORIZED OFFICIALS

The following officials are authorized to implement , amend, or terminate this Memorandum Of Understanding. For the South Dakota Department of Agriculture, the Secretary of the Department of Agriculture; for the South Dakota Department of Environment and Natural Resources, the Secretary of the Department of Environment and Natural Resources.

Robert Roberts, Secretary
Department of Environment and Natural Resources

11/20/92
Date

Jay P. Swisher

Jay Swisher, Secretary
Department of Agriculture

11/25/92
Date

APPENDIX C

CHAPTER 34A-12.[i]

REGULATED SUBSTANCE DISCHARGES

Section

§ 34A-12-1.

(1) "Corrective action," any action taken to minimize, contain, eliminate, remediate, mitigate, and clean up a discharge, including any necessary emergency remedial action;

(2) "Corrective action cost," any cost incurred by the department in the investigation of a discharge; removal, attempted removal, emergency remedial efforts, and corrective actions performed on a discharge; or the performance of reasonable measures undertaken to prevent or mitigate damage to the public health, safety, welfare, or environment of the state;

(3) "Department," the Department of Environment and Natural Resources;

(4) "Discharge," an intentional or unintentional act or omission which results in the release, spill, leak, emission, escape, or disposal of a regulated substance into the environment and which harms or threatens harm to

[i] Only statue numbers and text are included. Catchlines are copyrighted.

public health or safety or the environment. The term excludes any discharge made in compliance with the conditions of a federal or state permit;

(5) "Emergency remedial effort," any action taken to protect the public health, safety, or the environment from imminent danger resulting from a discharge, and any action taken to contain a discharge which, if not contained, will in time pose a greater threat to the public health, safety, or the environment than if such action is not immediately taken;

(6) "Environment," land, including public and private property, surface and underground waters, fish, wildlife, biota, air and other such resources within the state;

(7) "Person," public or private corporations, companies, associations, societies, firms, limited liability companies, partnerships, cooperatives, joint stock companies, individuals, the United States, this state and any of its political subdivisions and agencies, and any other state;

(8) "Regulated substance," the compounds designated by the department under §§ 23A-27-25, 34A-1-39, 34A-6-1.3(17), 34A-11-9, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68, including pesticides and fertilizers regulated by the Department of Agriculture, the hazardous substances designated by the Federal Environmental Protection Agency pursuant to section 311 of the Federal Water Pollution Control Act Amendments of 1972, Pub.L. 92-500 as amended by the Clean Water Act of 1977, Pub.L. 95-217, the toxic pollutants designated by Congress or the Federal Environmental Protection Agency pursuant to section 307 of the Toxic Substances Control Act, Pub.L. 99-519, the hazardous substances designated by the Federal Environmental Protection Agency pursuant to section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Pub.L. 96-510, and petroleum, petroleum substances, oil, gasoline, kerosene, fuel oil, oil sludge, oil refuse, oil mixed with other wastes, crude oils, substances or additives to be utilized in the refining or blending of crude petroleum or petroleum stock, and any other oil or petroleum substance. This term does not include sewage and sewage sludge;

(9) "Response fund," the regulated substance response fund established by § 34A-12-3;

(10) "Responsible person," a person who has caused a discharge of a regulated substance, or a person who is an owner or operator of a tank at any time during or after a discharge;

(11) "Secretary," the secretary of the Department of Environment and Natural Resources;

(12) "Tank," any one or a combination of containers, vessels, and enclosures, including structures and appurtenances connected to them, that is, or has been, used to contain or dispense a regulated substance which is either stationary or attached to a motor vehicle. This includes pipeline facilities which transport and store regulated substances. Facilities used exclusively for natural gas and liquified natural gas storage and transport are not included as part of §§ 23A-27-25, 34A-1-39, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68.

§ 34A-12-2.

The petroleum release compensation fund established pursuant to § 34A-13-18, shall make a one time contribution of three hundred fifty thousand dollars, to the response fund within one year after March 1, 1988, and shall contribute one hundred thousand dollars annually for five years to the groundwater protection fund to fund the groundwater research and education program established pursuant to § 46A-1-85.

§ 34A-12-3.

There is hereby established in the state treasury an operating fund to be known as the regulated substance response fund for the purpose of providing funds for the clean up of regulated substance discharges. In addition to the money from the petroleum release cleanup fund as provided in § 34A-12-2 and the temporary pesticide registration fee increase provided by § 38-20A-9, funds from the following sources shall be deposited into the response fund:

(1) Direct appropriations to the response fund from the general fund;

(2) Money, other than criminal fines assessed in criminal actions, recovered by the state in any action or administrative proceeding based upon violation of the state's environmental statutes or upon damage to the environment, including actions for administrative expense recoveries, civil penalties, compensatory damages, and money paid pursuant to any agreement, stipulation, or settlement in such actions or proceedings;

(3) Interest attributable to investment of the money in the response fund;

(4) Money received by the department in the form of gifts, grants, reimbursements, or appropriations from any source intended to be used for the purposes of the response fund.

All money in the response fund is continuously appropriated for the purposes specified in § 34A-12-4. All money received by the department for the response fund shall be set forth in an informational budget pursuant to § 4-7-7.2 and be annually reviewed by the Legislature.

§ 34A-12-3.1.

A subfund of the regulated substances response fund is hereby created for recovered leaking underground storage tank trust fund moneys. The subfund shall be separately maintained and administered in the manner required by the Superfund Amendments and Reauthorization Act of 1986 as amended as of January 1, 1990. Moneys deposited in the subfund shall be disbursed and used only for the purposes authorized under subtitle I of the Resources Conservation Recovery Act as amended, October 1986.

§ 34A-12-3.2.

On July first of each year, the state treasurer shall transfer all amounts in excess of one million seven hundred fifty thousand dollars from the regulated substance response fund established pursuant to § 34A-12-3, to the environment and natural resources fee fund established pursuant to § 1-40-30 to be expended in the manner and for the purposes of that fund.

§ 34A-12-4.

When necessary in the performance of his duties under §§ 23A-27-25, 34A-1-39, 34A-2-75, 34A-6-1.4, 34A-6-1.31, 34A-11-9, 34A-11-10, 34A-11-12, 34A-11-14, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68 and Title 34A relative to discharges, the secretary may expend funds from the response fund to provide for the costs of investigations, emergency remedial efforts, corrective actions and managerial or administrative activities associated with such activities. The secretary's use of the response fund shall be based upon the following:

(1) In the case of an investigation, when the secretary determines that a discharge has probably occurred and that the general operating budget of the department for such purposes is not adequate to cover the costs of the necessary investigatory activities;

(2) In the case of an emergency remedial effort, when the secretary determines that a discharge has occurred and that corrective actions shall be immediately undertaken to protect an imminent threat to the public health or safety or to contain a discharge which, if not immediately contained, shall in time pose a significantly greater threat to public health or safety or to the environment of this state than if such action is not immediately taken;

(3) In the case of a discharge not of an emergency nature when the secretary determines that a discharge has occurred, that a responsible party or liability fund capable of performing the corrective actions either cannot be identified or refuses to undertake corrective actions, and that corrective actions shall be undertaken to protect the public health, safety, welfare, or environment of the state.

§ 34A-12-5.

The department shall perform all administrative functions relative to the response fund and corrective actions funded by it. Disbursements from the response fund shall be on warrants drawn by the state auditor pursuant to vouchers approved by the secretary.

§ 34A-12-6.

The department may bring an action in circuit court against the responsible person to obtain reimbursement for corrective action costs expended from the response fund pursuant to §§ 23A-27-25, 34A-1-39, 34A-2-75, 34A-6-1.4, 34A-6-1.31, 34A-11-9, 34A-11-10, 34A-11-12, 34A-11-14, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68. The secretary may seek recovery of other funds expended by the department as a result of a discharge through actions brought under the provisions of Title 34A.

§ 34A-12-7.

The secretary shall promulgate rules pursuant to chapter 1-26 to provide for a list of regulated substances whose discharge harms, or threatens harm to, the public health, safety, welfare, or natural resources of the state.

§ 34A-12-8.

The discharge of a regulated substance is prohibited. This section does not apply to discharges of regulated substances pursuant to and in compliance with the conditions of a federal or state permit.

§ 34A-12-9.

Any person who has caused a discharge of a regulated substance shall immediately report the discharge to the department. The department may promulgate rules pursuant to chapter 1-26 to provide for the procedures to be followed in reporting a discharge.

§ 34A-12-10.

If a discharge in violation of § 34A-12-8 has occurred, or the department has reason to believe that a discharge in violation of § 34A-12-8 has occurred, the department shall order the responsible person to take corrective action concerning the discharge within a specified time. If the responsible person fails to comply with the department's order, the department may file an injunctive action in the circuit court of the county wherein the discharge has occurred seeking such corrective action. If the discharge occurs at any operation permitted under Title 34A or 45 and constitutes a violation of such permit, the department may order the operation to cease and desist further activity for the duration of the corrective action.

§ 34A-12-11.

The department may file an action in circuit court for preliminary and permanent injunctive relief whenever the secretary determines emergency remedial efforts are necessary to prevent, contain, control, or mitigate a discharge.

§ 34A-12-12.

Any person who has caused a discharge of a regulated substance in violation of § 34A-12-8 is strictly liable for the corrective action costs expended by the department pursuant to §§ 23A-27-25, 34A-1-39, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68.

§ 34A-12-13.

All corrective action costs expended pursuant to §§ 23A-27-25, 34A-1-39, 34A-2-75, 34A-6-1.4, 34A-6-1.31, 34A-11-9, 34A-11-10, 34A-11-12, 34A-11-14, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68 shall constitute a lien on all property owned by the responsible person when a notice of lien is filed with the register of deeds in the county in which such property is located. The notice of lien shall contain a description of the property of the responsible person upon which the lien is made, a description of the property upon which corrective action or emergency remedial efforts were made, and a statement of the corrective action costs expended from the response fund. Upon entry, the lien shall attach to all real property of the responsible person. The lien has priority over all other claims or liens on the property, except those which had been perfected prior to the department's filing of the notice of lien.

§ 34A-12-13.1.

Nothing in this chapter limits the authority of the department to establish environmental standards for remediation of air, soil, or water pollution pursuant to Title 34A, or to enforce site specific environmental remediation requirements in particular cases. This section does not limit the fund's authority to determine what constitutes reasonable and necessary expense in a corrective action.

§ 34A-12-14. Nothing in §§ 23A-27-25, 34A-1-39, 34A-2-75, 34A-6-1.4, 34A-6-1.31, 34A-11-9, 34A-11-10, 34A-11-12, 34A-11-14, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68 precludes the pursuit of any other administrative, civil, injunctive, or criminal remedies by the department or any other person. Administrative remedies need not be exhausted in order to proceed under §§ 23A-27-25, 34A-1-39, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68. The remedies provided by §§ 23A-27-25, 34A-1-39, 34A-12-1 to 34A-12-15, inclusive, 38-20A-9, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68 are in addition to those provided by existing statutory or common law.

§ 34A-12-15.

All money collected by the department in the enforcement of the provisions of Titles 34A and 45, or in any other action, proceeding or settlement based upon damage to the environment or a violation of the state's environmental laws, excluding criminal proceedings for criminal fines, shall be deposited into the response fund.

§ 34A-12-16.

If the department has determined that a discharge has occurred, the department shall conduct an investigation to determine the responsible person. The investigation may include a title search of the affected property and shall attempt to designate as the responsible person the person deemed to be the most responsible for the occurrence of the discharge. If the identity of the person who caused the discharge can be determined, that person shall be designated as the responsible person. If the identity of the person who caused the discharge cannot be determined, the owner of the property or operator of the tank at the time of the discharge shall be designated as the responsible person. If the person deemed responsible for the discharge contests the department's decision, a title search of the affected property shall be done.

§ 34A-12-17. Moved to § 34A-2-71.1.

§ 34A-12-18 to 34A-12-24. Moved to §§ 1-50-5 to 1-50-11.

APPENDIX D

INTERAGENCY AGREEMENT – SDDA/SDSU, COORDINATION OF PESTICIDE CERTIFICATION/RECERTIFICATION

DEPARTMENT OF AGRICULTURE
DIVISION OF REGULATORY SERVICES
Anderson Building, 445 East Capitol
Pierre, South Dakota 57501-3188
Phone (605) 773-3724
FAX (605) 773-3481

STATE OF SOUTH DAKOTA
CONSULTANT CONTRACT/LETTER OF AGREEMENT
FOR CONSULTANT SERVICES
BETWEEN

SDSU – Extension Service
Referred to as Consultant

SD Dept. of Agriculture
Referred to as State

The State hereby enters into an Agreement for Consultant Services with the Consultant.

A. THE CONSULTANT

1. The Consultant services on this agreement shall commence on October 1, 1992 and end on September 30, 1994.
2. The Consultant agrees with the Interagency Agreement for the coordination of pesticide certification and recertification.
3. The consultant agrees to hold harmless and indemnify the State of South Dakota, its officers, agents and employees, from and against any all actions, suits, damages, liabilities or other proceedings which may arise as a result of performing services hereunder. This section does not require the Consultant to be responsible for or defend against claims or damages arising solely from acts or omissions of the State, its officers or employees.

B. The STATE

1. Contingent on availability of appropriated funds and contingent upon receiving appropriate billing from SDSU (Extension Service), the State will make payment for services in the following manner:

$ 15,700 March 30, 1993
$ 15,700 September 30, 1993
$ 16,500 March 30, 1994
$ 16,500 September 30, 1994

2. The State will NOT pay any other expenses as a separate item.

3. TOTAL CONTRACT AMOUNT: $ 64,400.

4. The State agrees to:
   (1) Assist in obtaining training materials from other sources if necessary.

C. The Contractor agrees to:

1. Perform those activities as indicated in the "Interagency Agreement for the Coordination of Pesticide Certification and Recertification".
2. Required Reports:
   a. The Contractor is obligated to provide such reports as may be required by the Dept. of Agriculture.
   b. Submit to the Department of Agriculture an itemized expenditure report requesting payment of services.
3. Access to records, document papers, clauses. All costs for which payment is claimed shall be supported by properly executed payrolls, time records, invoices, contracts, vouchers or other documentation evidencing in proper detail the nature and propriety of the changes. The financial records shall be in accordance with the State's accounting procedures. The Contractor agrees to permit the state to examine and audit as necessary all records that may be required. The Contractor further agrees that the State or its authorized representative(s) may carry out monitoring and evaluation activities.
4. The Contractor agrees that the services to be performed shall not be assigned, sublet, or transferred to any other corporation or organization without approval of the South Dakota Department of Agriculture.
5. The Contractor declares no discrimination on basis of race, color, religion, creed, national origin, sex or age.
6. The Contractor will cooperate fully with the State in an audit of fiscal transactions related to expenditures made under the terms of this contract. This audit will be done in accordance with the provisions of generally accepted auditing standards, and the disposition of any problem(s) relating to questioned costs or fiscal irregularities on the part of the Contractor will be the responsibility of the Contractor.

D. OTHER PROVISIONS

1. AMENDMENT PROVISION: This contract contains the entire agreement between the parties, and is subject to and will be construed under the laws of the State of South Dakota, and may be amended only in writing signed by both parties.

2. TERMINATION PROVISION: This agreement can be terminated upon thirty (30) days written notice by either party and may be terminated for cause by the State at any time with or without notice.

3. DEFAULT PROVISION: This agreement depends upon the continued availability of appropriated funds and

expenditure authority from the Legislature for this purpose. This agreement will be terminated by the State if the Legislature fails to appropriate funds or grant expenditure authority. Termination for this reason is not a default by the State nor does it give rise to a claim against the State.

E. This contract does not allow for, nor is subject to indirect or administrative cost rates.

INTERAGENCY AGREEMENT FOR THE

COORDINATION OF PESTICIDE CERTIFICATION AND RECERTIFICATION

The South Dakota Department of Agriculture (Department), the South Dakota State University Cooperative Extension Service (Extension), and the United States Environmental Protection Agency (EPA) desire to cooperate in the implementation of Section 4 and Section 23 of the amended FIFRA (Public Law 92-516) and the South Dakota Compiled Law, Chapter 38-21, with regard to certification and training of commercial and private applicators.

I. DEPARTMENT agrees to:

A. Coordinate maintenance and administration of state plan for the certification of pesticide applicators as stated in Section 4 of the amended FIFRA and SDCL 38-21.

B. Maintain regulations under SDCL 38-21 to provide the state with the necessary authority to comply with the amended FIFRA.

C. Maintain the mechanism for and issue pesticide certification certificates, licenses, and collect license fees.

D. Review commercial and private applicator certification examinations.

E. Administer the grading of pesticide certification examinations.

F. Notify Pesticide Coordinator (within 24 hours) and cooperate with Extension in case of significant pesticide incidents or spills.

G. Participate in private and commercial applicator recertification meetings as budget constraints allow.

H. Monitor certification training to assure meeting requirements of Section 4 and Section 23 of the amended FIFRA (Public Law 92-516) and the South Dakota Compiled Law Chapter 38-21.

I. Deny, suspend or revoke certificates for cause.

J. Appraise the regional EPA office and Extension on issues and problems concerning the certification program.

K. Administer reciprocal agreements with other state lead agencies.

II. South Dakota State University Cooperative Extension Service will have the coordination and educational responsibility in certification and recertification of pesticide applicators (commercial and private). South Dakota State University Extension Service consists of and agrees to perform the following:

A: Extension Pesticide Coordinator will administer a statewide education and training program related to pesticide applicators including, but not limited to: understanding pests; labeling; safety requirements; environmental factors; consequences of pesticide misuse; hazards associated with residues; equipment use; application techniques; ground water protection and endangered species protection.

B. Extension Pesticide Applicator Certification Trainer will administer the development and coordination of this training program including the following areas:

1. Develop, with the Department of Agriculture and EPA, an Annual State Training Plan for pesticide applicator certification and recertification each year. Plan would include: materials developments, certification emphasis, special projects, recertification program/format/time-frame/dates/topics and planning meeting schedules. Planning to begin prior to the end of April of each year.
   Notify Department of private applicator meetings at least 7 days prior to session, if at all possible.

2. Conduct training for new Extension field staff verifying them as training agents for their particular areas.

3. Maintain current and acceptable certification exams and study materials at county level.

4. Be knowledgeable of the requirements for private and commercial applicator certification.

5. Assist Extension Agents in developing recertification meetings by providing training materials and necessary assistance.

6. Determine and coordinate program plans, including educational subject matter, dates and location for commercial

dealer/applicator recertification meetings with subject matter specialists, industry representatives and lead agency personnel.

7. Coordinate subject matter resource specialists for general category information on pesticide classification, safety, storage, and disposal.
   a: Develop or produce pesticide training or other educational material within budget and time constraints.
   b: Coordinate the development and revision of all category specific references and examinations at least every three years and provide to the Department as per Section I.D. of the Interagency Agreement For The Coordination of Pesticide Certification and Recertification.

8. Serve as Extensions contact for emergency situations regarding accidents, spills, or non-targeted contamination from pesticides and notify Department of Agriculture.

9. Participate as member of SDPIAC (S.D. Pesticide Impact Assessment Committee) and participate in other regional or national pesticide training programs as deemed necessary and to keep staff informed.

10. Inform Department of Agriculture of training programs relevant to pesticide applicator certification and recertification.

11. Coordinate the review and update of training materials as addressed in the annual certification and training plans.

12. Evaluate training progress.

13. Maintain certification exams and study materials in accordance with certification standards established in 40 CFR 171.4, 171.5 and ARSD 12:56.

14. Assist Department in developing a newsletter for continuing education of pesticide applicators.

C. Extension Specialists are responsible for subject matter information in their area of expertise for commercial and private applicators.

1. Determine appropriate subject matter required in a particular subject area per Environmental Protection Agency and SD Department of Agriculture guidelines.

2. Prepare, revise, and procure category specific training materials and examination(s) as required.

3. Provide training and education material for commercial pesticide dealers and applicators at 4 - 8 sites in South Dakota each year. Material to include, but not be limited to:
   a. Stress proper use, safe handling, proper storage, and proper disposal of pesticides and pesticide containers.
   b. Update of new pesticides, application methods, safety equipment, and other new techniques to relate to pesticide application.
   c. Disseminate information relevant to understanding pests, labeling, safety requirements, environmental factors, consequences of pesticide misuse, hazards associated with residue, equipment use, and application techniques.

4. Serve as the resource for information on special pesticide or pest problems or crisis situations.

5. Promote safe and proper use of pesticides through media, meetings and discussions throughout the year.

6. Train county extension personnel in specific pest subject matter areas.

D. Extension Agents are responsible for pesticide training programs having an action site at the county level.
   1. Notify Extension Pesticide Applicator Certification Trainer of applicator training at least two (2) weeks prior to training session of time/date/place.
   2. Provide clientele the opportunity to be certified or recertified as private applicators for the purpose of purchasing and applying restricted-use pesticides through the following mechanisms.

      Extension Agents offer:

      1. Training meeting on safe and proper use, handling, transportation and storage of pesticides.
      2. A home study course that covers safe and proper use, handling, transportation and storage of pesticides.
      3. Maintain current file of testing materials.

   3. Administer commercial applicator examination in county office.
      a. Insure that commercial applicators have the necessary training material prior to taking test.
      b. Maintain current testing files to include reference materials, tests, answer sheets and license forms.
      c. Inform commercial applicators of the recertification process.

4. Promote the safe and proper use of pesticides through media, meetings and discussions throughout the year.

5. Provide information regarding pesticide problems to Extension Pesticide Applicator Certification Trainer and serve as a reference person for specialists.

In witness hereto the parties signify their agreement by affixing signatures hereto:

Myles A. Hellickson 8/13/92
SDSU - Dir. of Extension (Date)
Signature(Date)

Authorized State 8/28/92

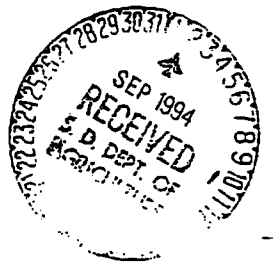
T. M. Lorang 8/28/92
SDSU - Dir. of Research (Date)

State Agency Coding Center: 03101-31 Account: 5204060

State Contact Person: Roger Scheibe/Brad Berven/Brian Scott

Consultant Social Security or Employer Number: 46-6000364

Addendum to Contract of
SDSU Extension Service and SD Department of Agriculture
Contract #0310-414-001 93



August 18, 1994

The above referenced contract to be amended as follows:

Page 1, A., 1. The Consultant Services on this agreement shall commence on October 1, 1992 and end on September 30, ~~1994~~ 1996.

Page 1, B., 1. Contingent on availability of appropriated funds and contingent upon receiving appropriate billing from SDSU (Extension Service), the State will make payment for services in the following manner.

$ 15, 700 March 30, 1993
$ 15,700 September 30, 1993
$ 16,500 March 30, 1994
$ 16,500 September 30, 1994
$ 17,150 March 30, 1995
$ 17,150 September 30, 1995
$ 17,850 March 30, 1996
$ 17,850 September 30, 1996

Page 1, B., 3. TOTAL CONTRACT AMOUNT: ~~$ 64,400~~ $ 134,400

Myles A. Hellickson 8/22/94
SDSU - Director of Extension Service (Date)

[signature] 8/30/94
SDSU - Director of Research (Date)

[signature] 9/6/94
Director, Division of Regulatory Services (Date)

APPENDIX E

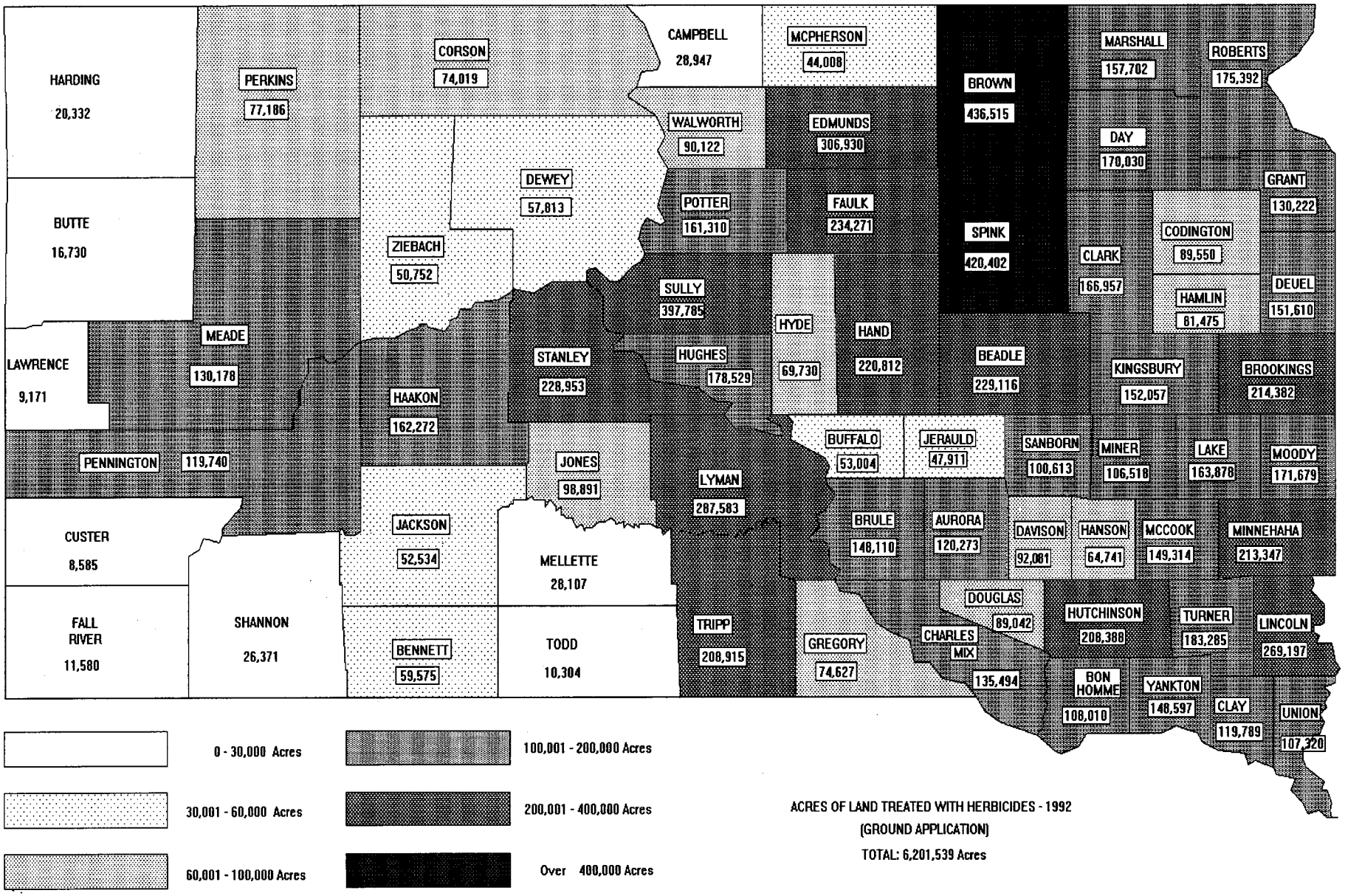
1997 Nonpoint Source Task Force Mailing List

Paula Sunde, USBR, Box 226, Newell, SD 57760-0226
Ralph Reimer, RR Box 144, Pukwana, SD 57370
Duane Murphey, DENR - DFTA, Inter-Office, Pierre, SD
Dennis Clarke, DENR - DFTA, Inter-Office, Pierre, SD
Jack Majeres, RR 2 Box 122, Dell Rapids, SD 57022-9208
Tim Bjork , DENR, Inter-Office, Pierre, SD
Pat Kuck , Consultant, Inter-Office, Pierre, SD
Bill Markley, DENR - DES, Inter-Office, Pierre, SD
Joan Bortnem , DENR - DFTA, Inter-Office, Pierre, SD
John Reedy, Senator, 314 E Main, Vermillion, SD 57069
Dale Kennedy, Board of Water & Natural Resources, 29533 48th Avenue, Beresford, SD 57004
Kevin Fridley, Director, Division of Regulatory Services, Department of Agriculture, Pierre, SD
Kelly Wheeler, Financial and Technical Assistance, Foss Building, Inter-Office Mail, SD
Richard Feguson, Chairman, SD Conservation Commission, HC 1 Box 59, Artisian, SD 57314-9757
Angela Ehlers, SDACD, 116 N Euclid, Pierre, SD 57501-2521
Diane Clayton, USDA - CFSA - Federal Building, 200 Fourth St SW, Huron, SD 57350-2475
Kurt Buer, Black Hills RC&D, PO Box 8142, Rapid City, SD 57709-8142
Dan Driscoll, USGS, 1608 Mountain View Road, Rapid City, SD 57702
Charles Berry, Department of Fish and Wildlife - SDSU, Box 2206, Brookings, SD 57007-2206
John Kirk , Dept of Game Fish & Parks, Foss Building, Pierre, SD 57501-3182
Roger Mack, Director, First Dist Assoc of Local Gov, PO Box 1207, Watertown, SD 57201-1207
RC&D Coordinator - Randall RC&D, PO Box 247, Lake Andes, SD 57356
Jay Gilbertson, Manager, East Dakota WDD - City Plaza Mall, 307 Sixth Street, Brookings, SD 57006
Darrell Raschke, Manager, James River Water Dev District, PO Box 849, Huron, SD 57350-0849
Chuck Ullery, Agricultural Engineering Dept - SDSU, AE 229 Box 2120, Brookings, SD 57007-2120
James Madsen President, Izaak Walton League of America, 1452 S Lake Dr, Watertown, SD 57201-5453
Richard P Allen, President, Flandreau Santee Sioux Tribe, PO Box 283, Flandreau, SD 57028-0283
John Steele, President, Oglala Sioux Tribe, PO Box H, Pine Ridge, SD 57770-2070
Duane Big Eagle Chairman, Crow Creek Sioux Tribe, PO Box 50, Fort Thompson, SD 57339-0050
Gregg Bourland, Chairman, Cheyenne River Sioux Tribe, PO Box 590, Eagle Butte, SD 57625-0590
Michael B Jandreau, Chairman, Lower Brule Sioux Tribe, PO Box 187, Lower Brule, SD 57548-0187
Ron Cody, Assistant Secretary of Agriculture, Department of Agriculture, Inter-Office, SD
Mike Selvage Chairman, Sisseton-Wahpeton Sioux Tribe, PO Box 509, Sisseton, SD 57262-0509
Jay Taken Alive, Chairman, Standing Rock Sioux Tribe, PO Box D, Fort Yates, ND 58538-0522
Karl Whitmore, N Central RC&D Coordinator, PO Box 1258, Pierre, SD 57501-1258
Jim Johnson, Range Specialist, CES SDSU Ag Res & Ex Cntr, 1905 N Plaza Drive, Rapid City, SD 57702-9302
David Rathke, EPA Region VIII - One Denver Pl Ste 500, 999 - 18 Street, Denver, CO 80202-2466
Greg Sandsness, North Dakota State Dept of Health, PO Box 5520, Bismarck, ND 58502-5520
William Keiry, HC 76 Box 164, Nisland, SD 57762-9712
Le Roy Holtsclaw, Nat Res Conservation Serv - Fed Bldg, 200 4th St SW, Huron, SD 57350-2475
Jerry Thelen, Project Coordinator, Bad River Water Quality Project, PO Box 98, Fort Pierre, SD 57532-0098
John Deppe, Lower James RC&D - Norwest Bank Bldg, 403 N Lawler Suite 200, Mitchell, SD 57301-2637
Ray Sowers, Div of Res Conservation & Forestry, Department of Agriculture, Inter-office, SD
Susan Hixon, US Forest Service - BH National Forest, RR 2 Box 200, Custer, SD 57730-9501
Tim Reich, SD Assoc of Conservation Districts, 1007 Kingsbury, Belle Fourche, SD 57717-1920

Bruce MacNeill, RR 1 Box 73, Tulare, SD 57476
Nettie Myers, Secretary, DENR, Inter-Office, SD
David Nelson, Chairperson, SDRC, 1818 Brighton Rd, Brookings, SD 57006-4162
Mike Schmidt, SD Cattleman's Association, RR 1 Box 18, Dell Rapids, SD 57022
Steve Sando, US Geological Survey, 111 Kansas Ave SE, Huron, SD 57350-2005
Robert Gab, Route 2 - Box 121, Eureka, SD 57437-9330
Lowell Mesman, SD Farm Bureau, PO Box 7193, Pierre, SD 57501-7193
Mellette-Todd County Water Quality Advisory Board % Dave Steffen, PO Box I, White River, SD 57579-0709
Rodney D Baumberger, NRCS - Fed Bldg Room 239, 515 9th St, Rapid City, SD 57701-2663
Dr Scott Kenner, SD School of Mines and Technology, 501 E St Joseph Street, Rapid City, SD 57701-3995
Dave Hauschild, SD Water Congress, PO Box 7041, Pierre, SD 57501-7041
Darrel Drapeau, Chairman, Yankton Sioux Tribe, PO Box 248, Marty, SD 57361-0248
William Kindle, President, Rosebud Sioux Tribe, PO Box 430, Rosebud, SD 57570-0430
Steve Lowrie, Board of Water & Natural Resources, PO Box 10, Watertown, SD 57201-0010
Steve and Mary Flanderka, Black Hills Forest Resources Assoc, 2040 W Main Suite 315, Rapid City, SD 57702
Dave Steffen, 19026 SD Highway 1804, Pierre, SD 57501-9794
Jane Heeren, Prog Coord, SD Corn Growers, 1406 W Russell, Sioux Falls, SD 57104
Jim Stukel, Jackson County Conservation District, PO Box 457, Kadoka, SD 57543-0457
Carolyn Johnson, Badlands RC&D Office, Courthouse Main Street, PO Box 314, Martin, SD 57551-0314
Cinday Tusler, S Central RC&D Office, Mellette County Courthouse, PO Box 231, White River, SD 57579
Gene Williams, SD Assn of Conservation Dists, HCR 1 Box 53A, Philip, SD 57567-9593

APPENDIX F

1992 COMMERCIAL APPLICATOR SUMMARY



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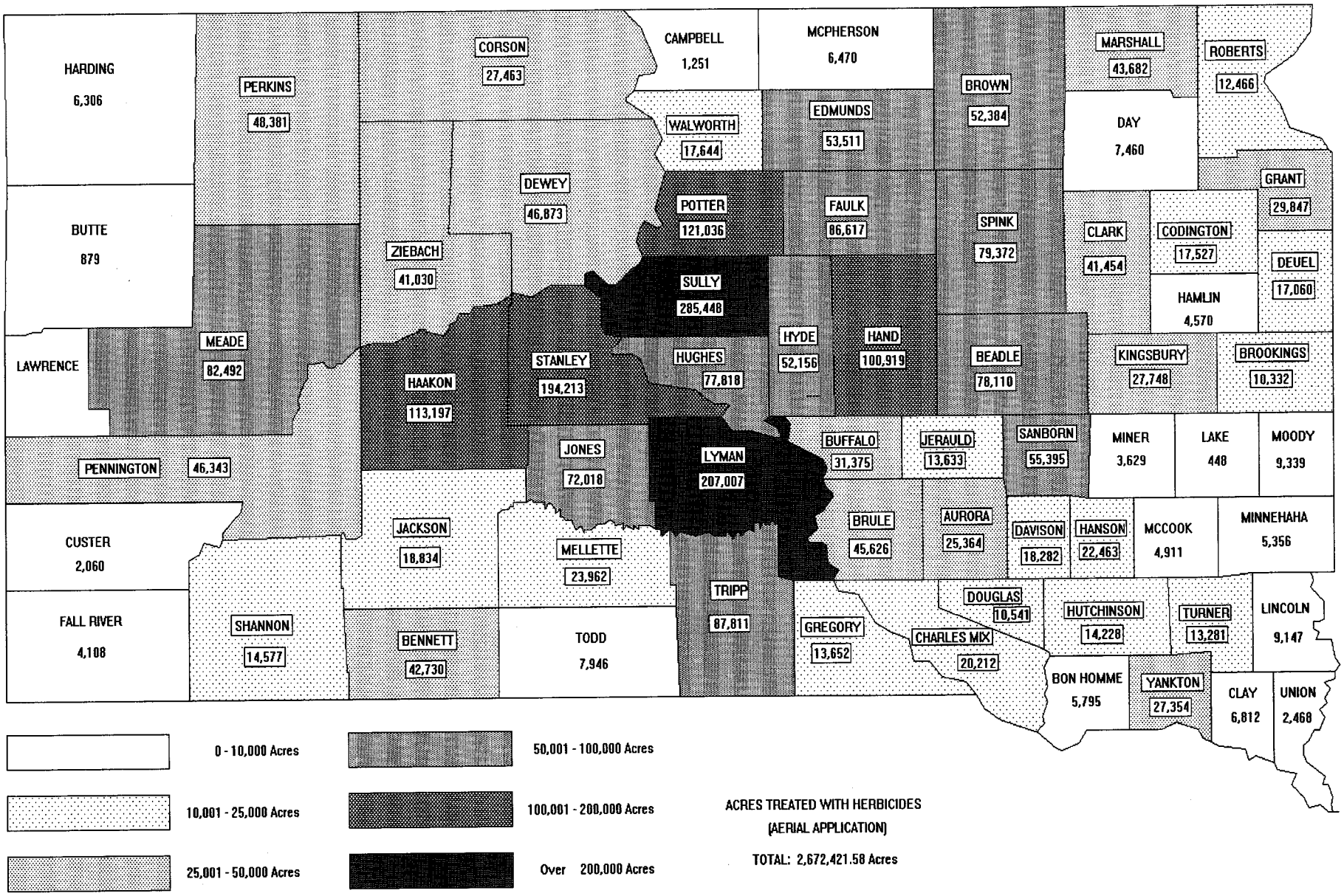

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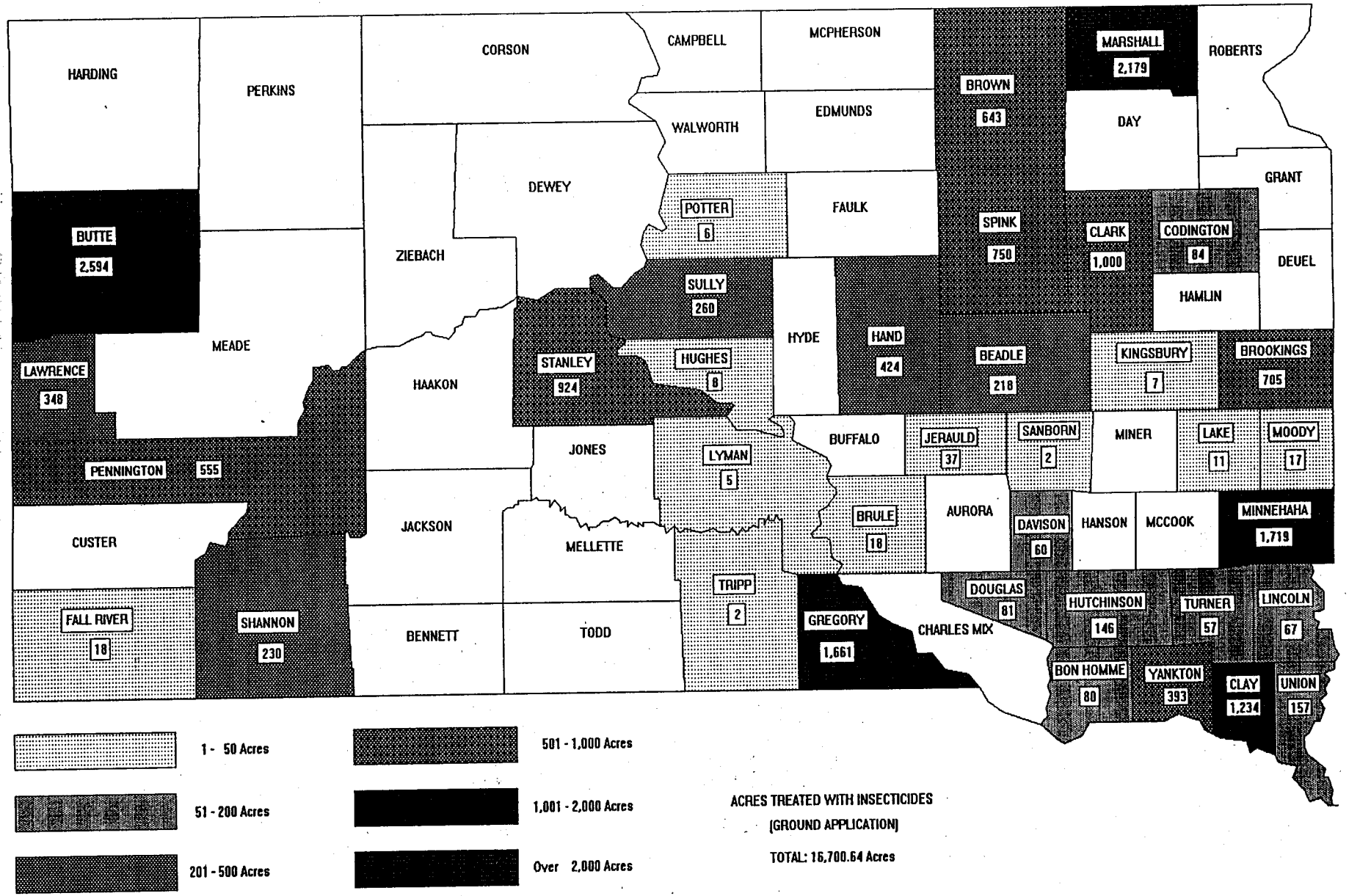

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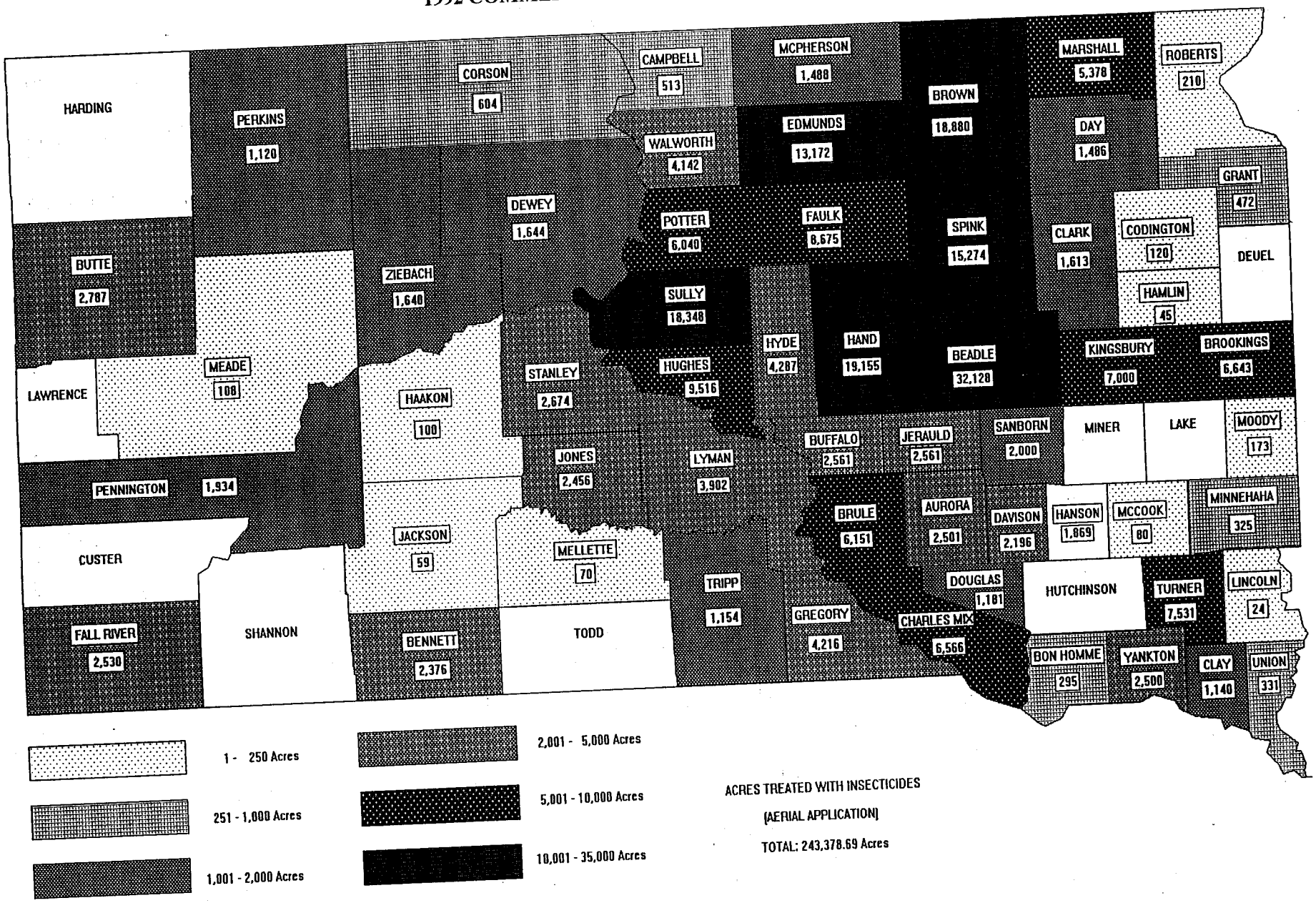

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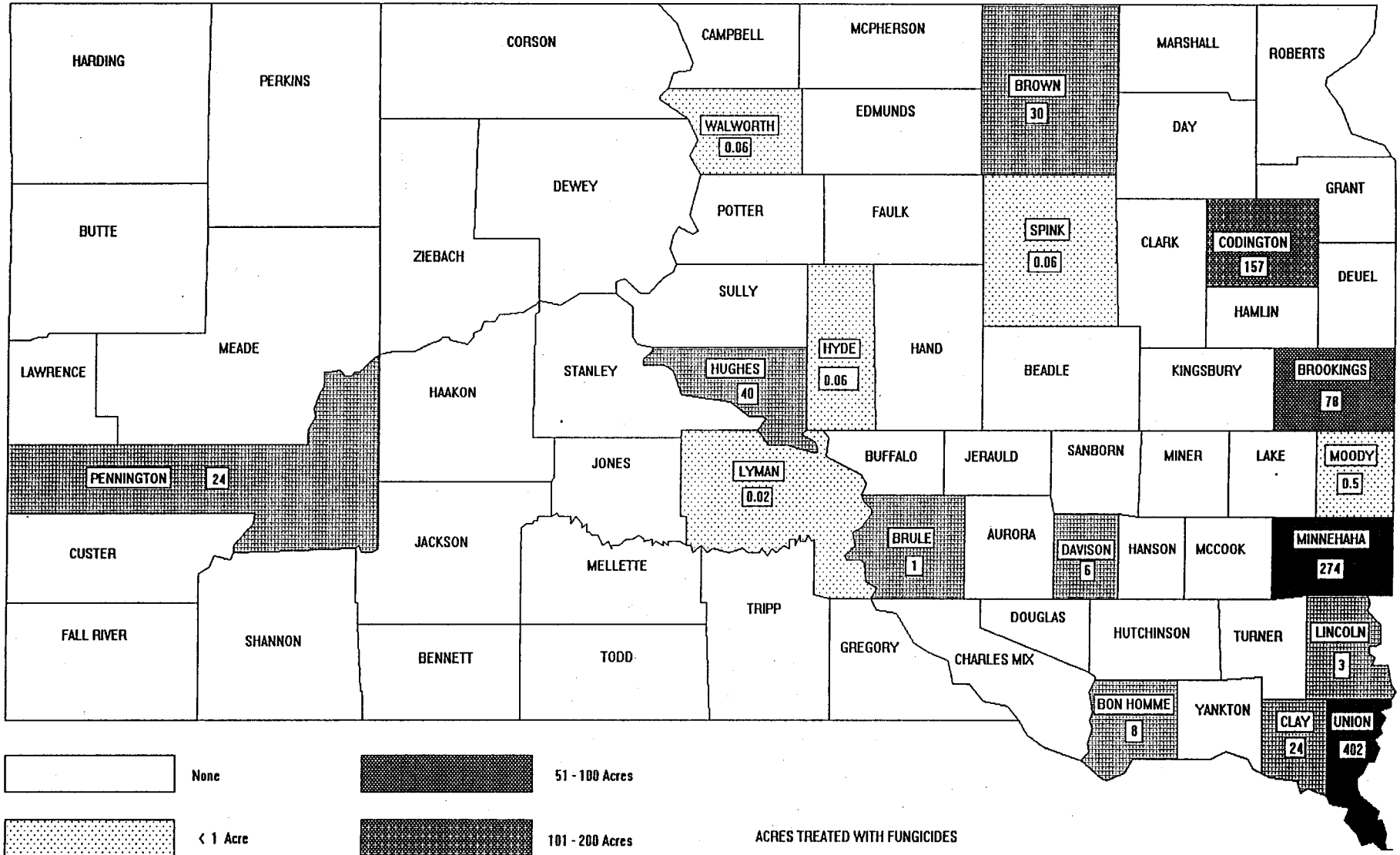

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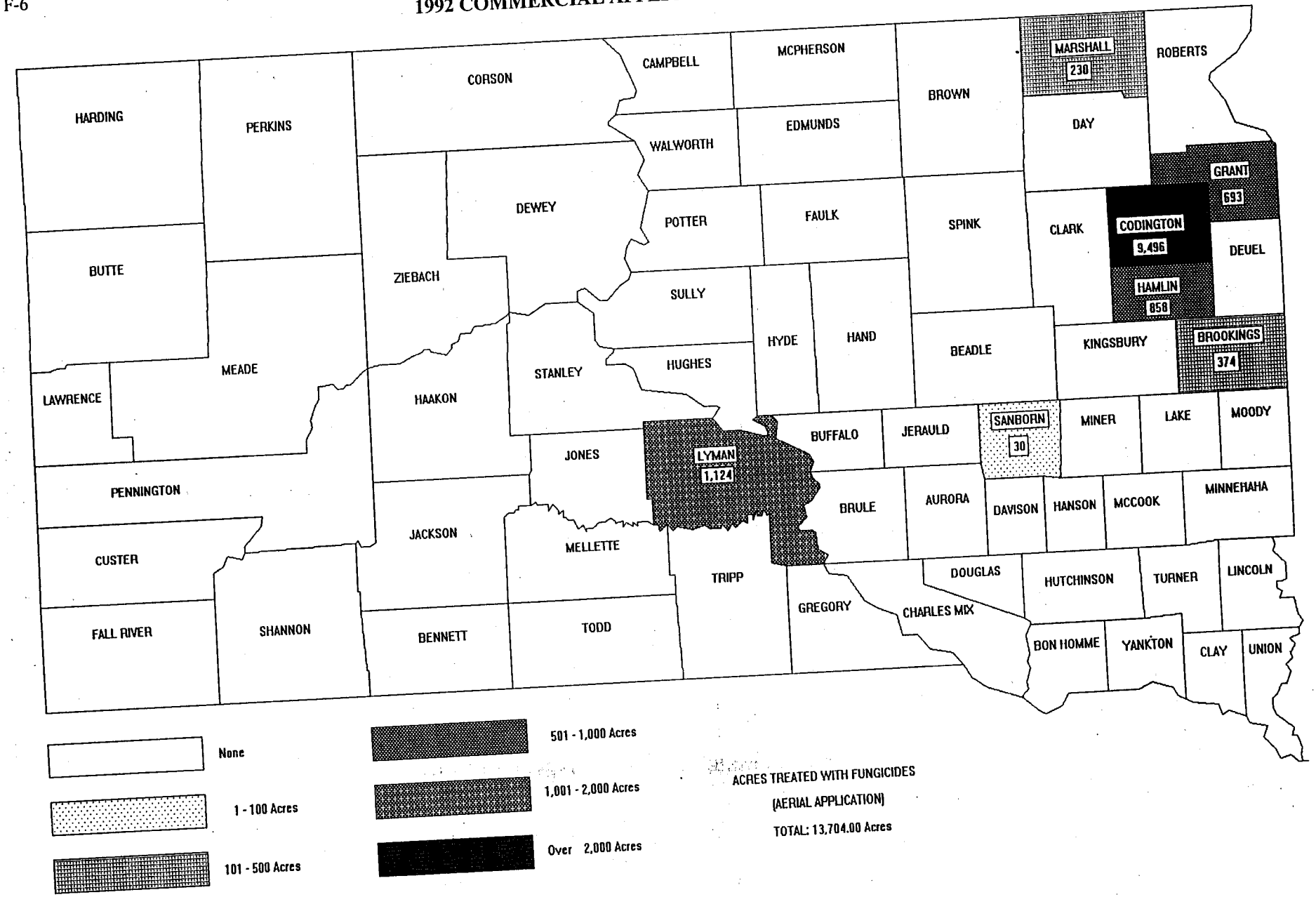

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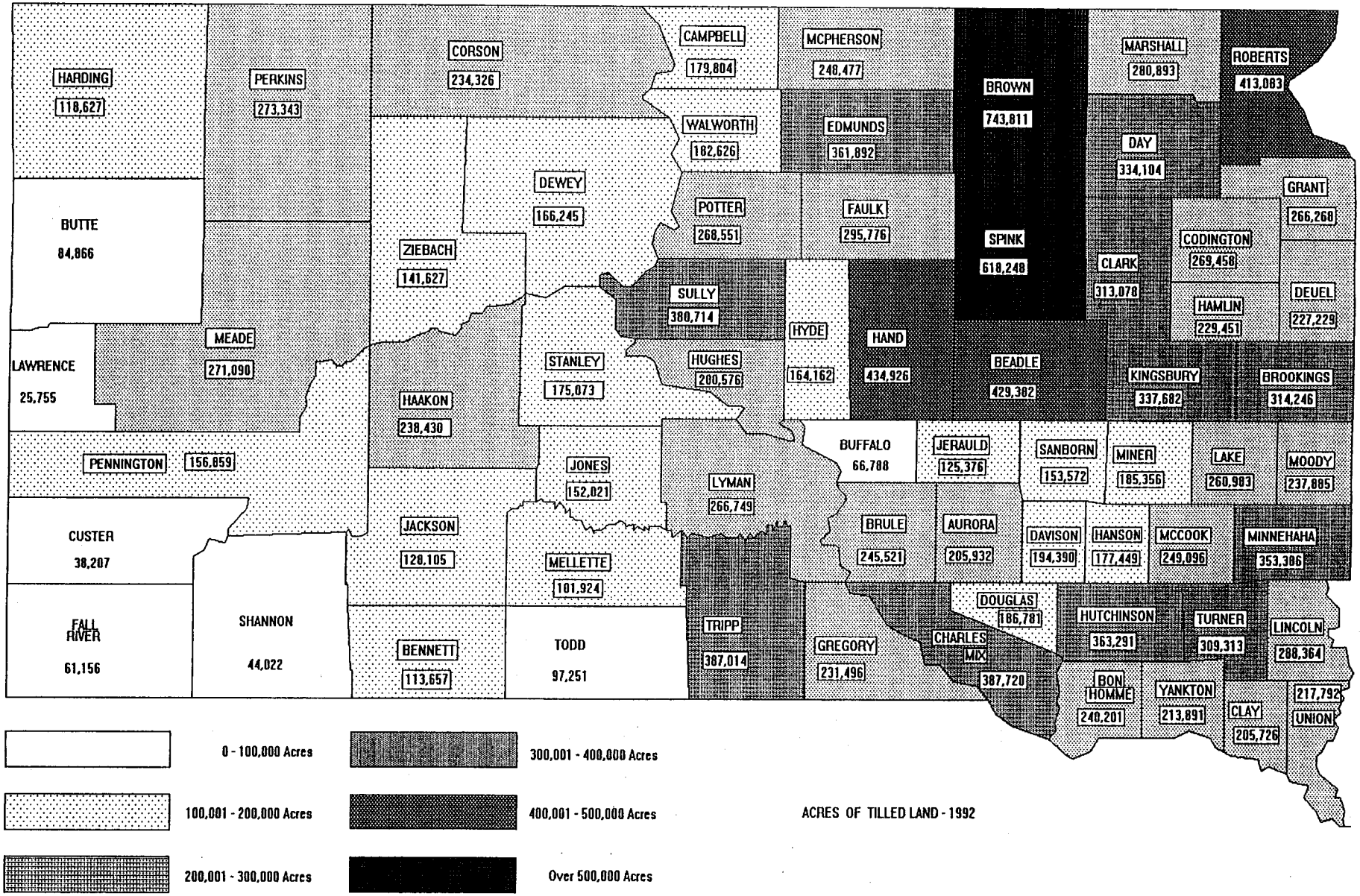

APPENDIX G

CHAPTER 74:54:01
GROUNDWATER QUALITY STANDARDS

Sec.

74:54:01:01. Definitions

Words defined in SDCL 34A-2-2 have the same meaning when used in this chapter. In addition, terms used in this chapter mean:

(1) "Ambient," the constituents or parameters and the concentration or measurements which describe water quality prior to a subsurface discharge;

(2) "Contaminant," any physical, chemical, biological, or radiological substance or matter in water potentially harmful to human health;

(3) "Groundwater," water below the land surface that is in the zone of saturation;

(4) "EPA," the United States Environmental Protection Agency;

(5) "mg/L," milligrams per liter;

(6) "pH," a measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with alkalinity and decreasing with acidity;

(7) "Picocurie," that quantity of radioactive material producing 2.22 nuclear transformations per minute;

(8) "Pollutant," dredged spoil, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, or agricultural waste discharged into waters of the state;

(9) "Secretary," the secretary of the Department of Environment and Natural Resources or a representative designated to act for the secretary;

(10) "Total dissolved solids," "TDS," a term that expresses the quantity of dissolved material in a sample of water, which is determined by weighing the solid residue obtained by evaporating a measured volume of filtered sample to dryness at 356 degrees Fahrenheit.

Source:

14 SDR 86, effective December 24, 1987; 18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:01, July 1, 1996.

General Authority:

SDCL 34A-2-11.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

74:54:01:02. Toxic pollutant defined

A toxic pollutant is a water contaminant or combination of water contaminants in a concentration or concentrations which, upon exposure, ingestion, inhalation, or assimilation either directly from the environment or indirectly by ingestion through food chains, will unreasonably threaten or injure human health or the health of animals or plants. As used in this section, injuries to health include death, histopathologic change, depression of immune system, clinical symptoms of disease, behavioral abnormalities, genetic mutation, physiological malfunctions, and physical deformations in such organisms or their offspring. In order to be considered a toxic pollutant a contaminant must be one or a combination of the potential toxic pollutants shown by scientific information currently available to the public to have potential for causing one or more of the effects listed in this section.

Source:

18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:01.01, July 1, 1996.

General Authority:

SDCL 34A-2-11.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

74:54:01:03. Classification of groundwater

The existing and future beneficial uses of groundwater shall be maintained and protected. Waters of the state in which ambient water quality is better than the minimum levels prescribed shall be maintained and protected at the better water quality.

Groundwater which has an ambient concentration of 10,000 mg/L or less total dissolved solids (TDS) is classified as having the beneficial use of drinking water supplies, suitable for human consumption.

If the ambient concentration of any water contaminant in the groundwater is in conformance with the standards in § 74:54:01:04, degradation of the groundwater to the limit of the standards may be permitted as specified in chapter 74:54:02 to accommodate necessary economic or social development upon approval of a water quality variance permit.

No water quality standards may be violated or designated beneficial uses be impaired by the granting of a water quality variance permit allowing degradation of groundwater quality. If the groundwater quality does not meet the standards in § 74:54:01:04 as a result of natural causes or conditions, no degradation of the groundwater beyond the ambient concentration may be allowed.

Source:

14 SDR 86, effective December 24, 1987; 18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:02, July 1, 1996.

General Authority:

SDCL 34A-2-11.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

74:54:01:04. Standards for groundwater of 10,000 mg/L TDS concentration or less

The following standards are the allowable pH range and maximum allowable concentration in groundwater of 10,000 mg/L TDS concentration or less for the contaminants specified unless the ambient condition exceeds the standards. Regardless of whether there is one contaminant or more than one contaminant present in groundwater, when the ambient pH or concentration of any water contaminant exceeds the standard specified in this section, the ambient pH or concentration is the allowable limit, provided that the discharge at such concentrations will not result for the present or the reasonably foreseeable future in concentrations at any place of groundwater withdrawal in excess of the standards in this section.

These standards apply to the dissolved portion of the contaminants specified, with the exception of mercury and the organic compounds, using the definition of "dissolved" given in the publication "Methods for Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency (1983). The standards for mercury and the organic compounds apply to the total unfiltered concentrations of the contaminants.

Groundwater must meet the standards listed as follows unless otherwise provided by chapters 74:54:01 and 74:54:02:

TABLE ONE

Human Health Standards

Contaminant	Level
Alachlor	0.002 mg/L
Aldicarb	0.003 mg/L
Aldicarb Sulfone	0.003 mg/L
Aldicarb Sulfoxide	0.004 mg/L
Arsenic (As)	0.05 mg/L
Atrazine	0.003 mg/L
Barium (Ba)	2 mg/L
Cadmium (Cd)	0.005 mg/L
Carbofuran	0.04 mg/L
Chloradane	0.002 mg/L
Chromium (Cr)	0.1 mg/L
Copper (Cu)	1.3 mg/L
Cyanide (CN) weak-acid dissociable	0.75 mg/L
Dibromochloropropane (DBCP)	0.0002 mg/L
o-Dichlorobenzene	0.6 mg/L
cis 1,2-Dichloroethylene	0.07 mg/L
trans 1,2-Dichloroethylene	0.1 mg/L
1,2-Dichloropropane	0.005 mg/L
Ethylbenzene	0.7 mg/L
Ethylene dibromide (EDB)	0.00005 mg/L
Fluoride (F)	2.4 mg/L
Heptachlor	0.0004 mg/L
Heptachlor epoxide	0.0002 mg/L
Lead (Pb)	0.015 mg/L
Mercury (Hg)	0.002 mg/L
Monochlorobenzene	0.1 mg/L
Nitrate as N	10 mg/L
Nitrite	1 mg/L
Pentachlorophenol	0.001 mg/L
Selenium (Se)	0.05 mg/L
Silver (Ag)	0.05 mg/L
Styrene	0.1 mg/L
Endrin	0.0002 mg/L
Lindane	0.0002 mg/L
Methoxychlor	0.04 mg/L
Tetrachloroethylene (PCE)	0.005 mg/L
Toluene	1 mg/L
Toxaphene	0.003 mg/L
2,4-D	0.07 mg/L
2,4,5-TP Silvex	0.05 mg/L
Total trihalomethanes, including trichloromethane (chloroform), dibromochloromethane (chlorodibromomethane), bromodichloromethane, and tribromomethane (bromoform)	0.1 mg/L
Fecal coliform bacteria	less than 2.2 organisms per 100 mL (MPN)
Radium 226 and radium 228	5 picocuries per liter
Gross alpha, excluding uranium	15 picocuries per liter
Uranium	0.02 mg/L
Trichloroethylene	0.005 mg/L
Carbon tetrachloride	0.005 mg/L
Vinyl chloride	0.002 mg/L
1,2-Dichloroethane	0.005 mg/L
Benzene	0.005 mg/L
1,1-Dichloroethylene	0.007 mg/L
1,1,1-Trichloroethane	0.200 mg/L
para-Dichlorobenzene	0.075 mg/L
Total hydrocarbons	10* mg/L
Polychlorinated biphenals (PCBs)	0.00005 mg/L
Xylene	10 mg/L

* Where Total Petroleum Hydrocarbons is less than or equal to the standard in this section and greater than 0.1 mg/L, and is within the radius of influence of a well or within a delineated wellhead protection area, clean up must continue until 0.1 mg/L is met unless a water quality variance can be obtained in accordance with § 74:54:02:03 for an accidental

spill or leak if it has been shown by either practice or study that all reasonable other alternatives for groundwater clean-up will not result in further removal of contaminant concentrations from the groundwater. Total petroleum hydrocarbons must be analyzed using the California/United States Geological Survey Method published in "Draft Method for Total Petroleum Hydrocarbons and Total Organic Lead," February 1988, or its equivalent.

TABLE TWO

Other standards that are not applicable to groundwater receiving discharge from publicly owned treatment works.

Contaminant	**Level**
Chloride	250 mg/L
PH	6.5-8.5
Sulfate	500 mg/L
TDS	1000 mg/L

If the standards in either table one or table two are exceeded by ambient groundwater quality, the ambient water quality becomes the maximum allowable limit, as determined in § 74:54:02:18, for an approved groundwater discharge plan unless that exceedance results from a discharge from a publicly owned treatment work.

Source:

14 SDR 86, effective December 24, 1987; 18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:03, July 1, 1996.

General Authority:

SDCL 34A-2-11.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

References:

EPA Methods, Methods for Chemical Analysis of Water and Wastes, 1983, Stock Number EPA-600/4-79-020, 550 pages, published by the U.S. Environmental Protection Agency. Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The cost is $3.

"Draft Method for Total Petroleum Hydrocarbons and Total Organic Lead," February 1988, Hazardous Materials Laboratory, California Department of Health Services, 2151 Berkeley Way, Berkeley, California 90704, 405-540-3003.

Cross-References:

Organic chemicals, § 74:04:05:06.

Radionuclides, § 74:04:05:17.

40 C.F.R. §§ 141.11, 141.12, and 141.14 to 141.16, inclusive (July 1, 1991).

40 C.F.R. § 141.24 (July 1, 1991).

40 C.F.R. § 141.61 (July 1, 1991).

40 C.F.R. § 143.3 (July 1, 1991).

74:54:01:05. Potential toxic pollutants

Groundwater shall not contain potential toxic pollutants. Potential toxic pollutants include those listed in Table Three in this section. The following pollutants must be nondetectable in groundwater at detection limits of the currently acceptable sampling and analytical techniques as approved by the secretary in § 74:54:01:06 until a maximum contaminant level (MCL) is set by the EPA.

TABLE THREE

Potential Toxic Pollutants

Acetone
Acrylamide
Adipates
Bromobenzene
Bromomethane
Butyle acetate
Chloramben
Chlorobenzene
Chloroethane
Chloromethane
o –Chlorotoluence
p-Chlorotolune
Dalapon
DCPA
Dibromomethane
Dicamba
m-Dichlorobenzene
1,1-Dichloroethane
Dichloromethane
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
Dinoseb
Diquat
Endothall
Epichlorohydrin
Fonofos
Glyphosate
Hexachlorocyclopentdiene
Metolachlor
Methyl ethyl ketone
Methylene chloride
Metribuzin
Napthalene
PAH's (Polynuclear aromatic hydrocarbons)
Parathion
Phenol
Phthalates
Phorate
Pichloram
Simazine
2,3,7,8-TCDD (Dioxin)
Trichlorobenzene
1,1,2-Trichloroethane
1,2,3-Trichloropropane
Trifluralin
1,1,1,2-Tetrachloroethane
1,1,2,2,2-Tetrachloroethane

Source:

14 SDR 86, effective December 24, 1987; 18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:04, July 1, 1996.

General Authority:

SDCL 34A-2-11.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

74:54:01:06. Sampling and analytical techniques

Sampling and analytical techniques and quality assurance plans must conform with the following references unless otherwise specified by the secretary:

(1) **Standard Methods for the Examination of Water and Wastewater**, sixteenth edition, 1985;

(2) **E.P.A. Methods, Methods for Chemical Analysis of Water and Wastes**, 1983;

(3) **Techniques of Water Resource Investigation of the U.S. Geological Survey**, (1982);

(4) The methods for monitoring published in 56 Fed. Reg. 3,578-3,597 (January 30, 1991) and 56 Fed. Reg. 30,266-30,281 (July 1, 1991) (both references to be codified at 40 C.F.R. Parts 141 and 142, National Primary Drinking Water Regulations) and 52 Fed. Reg. 25,942-25,953 (July 9, 1987) (to be codified at 40 C.F.R. Parts 264, including Appendix IX, and 270);

(5) **National Handbook of Recommended Methods for Water-Data Acquisition**, GSA-GS edition;

(6) **Manual of Analytical Methods for the Analysis of Pesticide in Humans and Environmental Samples**, 1980.

Source:

14 SDR 86, effective December 24, 1987; 18 SDR 128, effective February 11, 1992; transferred from § 74:03:15:05, July 1, 1996.

General Authority:

SDCL 34A-2-93.

Law Implemented:

SDCL 34A-2-10, 34A-2-11.

References:

Standard Methods for the Examination of Water and Wastewater, sixteenth edition, 1985, Library of Congress catalogue number: 55-1979, ISBN:0-87553-131-8, 1268 pages, is prepared and published jointly by the American Public Health Association and the Water Pollution Control Federation. Copies may be obtained from the publication office: American Public Health Association, American Water Works Association, 1015 Fifteenth Street N.W., Washington, D.C. 20005. The cost is $125.

E.P.A. Methods, Methods for Chemical Analysis of Water and Wastes, 1983, Stock Number EPA-600/4-79-020, 550 pages, is published by the U.S. Environmental Protection Agency. Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325. The cost is $3.

Techniques of Water Resource Investigation of the U.S. Geological Survey, (1982), Book 5, Chapter A3. Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325. The cost is $3.75.

National Handbook of Recommended Methods for Water-Data Acquisition, 1983, GSA-GS edition, book 85 AD-2777, Task 6800-035 Stock Number 024-001-03489-1. Published by the Office of Ground Water Protection. Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325. The cost is $13.

Manual of Analytical Methods for the Analysis of Pesticide in Humans and Environmental Samples, 1980, Stock Number EPA-600/8-80-038, U.S. Environmental Protection Agency. Copies are available from National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161. The cost is $42.95, (microfiche $6.50).

APPENDIX H

WATER QUALITY SAMPLE INFORMATION

Sample Number _____

Collection Date _____

COLLECTION, FILTERING, LABORATORY INFORMATION

Sample Type G / S

Collector(s) _____

_____

Project _____ Project Manager _____

	Collection Time	Sampling Method	Filtered?	Lab	Chain of Custody?
Major Ions	:		Y / N		Y / N
Pesticides	:		Y / N		Y / N
Trace elements	:		Y / N		Y / N
VOCs	:		Y / N		Y / N
Radionuclides	:		Y / N		Y / N
Cyanide	:		Y / N		Y / N
Immunoassay	:		Y / N		Y / N

WELL INFORMATION

Well Depth _____ (ft from casing top)

SDGS Well Name _____

Depth to Water _____ (ft from casing top)

Water Rights Well Name _____

Casing Top Elevation (ft) _____ T / I

Other Well Name _____

Casing Type _____

Aquifer _____

Owner/Controller _____

Management Unit _____

Usage _____

SURFACE WATER INFORMATION

Lake _____

Stream _____

Other _____

Where Collected _____

LOCATION INFORMATION

Location _____ - _____ - _____

Ground Surface Elevation (ft) _____ T / I

Latitude _____

Basin _____

Longitude _____

Hydrologic Unit Code _____

County _____

Notes _____

_____

_____

Sample Number _____

FIELD PARAMETERS

Temp (unfiltered) _____ (□C)

pH (unfiltered) _____

Conductivity (unfiltered) _____ umhos/cm

pH (filtered) _____

Conductivity (filtered) _____ umhos/cm

Dissolved O_2 (unfiltered) _____ mg/L

Eh (unfiltered) _____ mV

Alk-T _____ mg/L as $CaCO_3$

Turbidity (unfiltered) _____ NTU

Alk-P _____ mg/L as $CaCO_3$

NO_3-N+NO_2-N (HACH method) _____ mg/L

NH_3-N (HACH method) _____ mg/L

WELL PURGING INFORMATION

Purging Method _____

Measured from Casing Top:

Well Depth (ft) _____._____ Well Diameter (in) _____

(-) Depth to Water (ft) _____._____

(=) Water Column (ft) _____._____ X 0._____ gal/ft liter/ft =

1 Well Volume (gal) (liter) _____

Pumping Rate _____ (gal/ min) (liter/min) X Duration of pumping (min) _____ =

Total Volume of Water Removed (gal) (liter) _____

(Total Vol. / 1 Well Vol.) = **Number of Well Volumes Removed (volumes)** _____

Start Time _____ AM PM End Time _____ AM PM

Time	Temp	**Cond**	pH	Water Level	**Turbidity**	**Dissolved O_2**
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.
:	.		.	.		.

Comments _____

_____

_____

Sample Number _____

Cations (mg/L)

Ca _____

Mg _____

Na _____

K _____

Fe _____

Mn _____

Anions (mg/L)

HCO_3 _____

CO_3 _____

SO_4 _____

Cl _____

F _____

NO_3-N+NO_2-N _____

NO_2-N _____

NO_3-N _____

Notes _____

Other parameters

NH_3-N _____ (mg/L)

Total P _____ (mg/L)

Lab TDS _____ (mg/L @ 180□C)

Lab Cond _____ (umhos/cm @ 25□C)

Hardness _____ (mg/L as $CaCO_3$)

Lab pH _____ (compensated to 25□C)

Lab Alk-T _____ (mg/L as $CaCO_3$)

Lab Alk-P _____ (mg/L as $CaCO_3$)

Cations _____ (me/L)

Anions _____ (me/L)

% Difference _____

Cyanide _____ **(mg/L)**

Notes _____

Trace elements (ug/L)

Ag	_____	Cu	_____
As	_____	Hg	_____
B	_____	Ni	_____
Ba	_____	Pb	_____
Be	_____	Sb	_____
Cd	_____	Se	_____
Cr	_____	Tl	_____
		Zn	_____

Notes _____

_____

_____

_____

Radionuclides

Gross Alpha	_____ (pCi/L)	+/-	_____
Gross Beta	_____ (pCi/L)	+/-	_____
Radium 226	_____ (pCi/L)	+/-	_____
Radium 228	_____ (pCi/L)	+/-	_____
Radium 226+228	_____ (pCi/L)	+/-	_____
Radon	_____ (pCi/L)	+/-	_____
Uranium	_____ (ug/L)	+/-	_____

Notes _____

_____

_____

_____

Pesticide Results

Sample _____

Common Name	Trade Name	Concentration (ug/L)	Comments
Acetochlor	Harness/Surpass		
Acifluorfen	Blazer		
Alachlor	Lasso		
Atrazine	AAtrex		
desethyl Atrazine			
desisopropyl Atrazine			
Bentazon	Basagran		
Bromoxynil	Buctril		
Butylate	Sutan		
Carbofuran	Furadan		
Chloramben	Amiben		
Chlorpyrifos	Lorsban		
Cyanazine	Bladex		
2,4-D	2,4-D		
DCPA	Dacthal		
Dicamba	Banvel		
Diclofop-methyl	Hoelon		
Dimethazone	Command		
Disulfoton	Disyston		
Diuron	Karmex		
Endrin	Endrin		
EPTC	Eradicane		
Ethalfluralin	Sonalan		
Ethoprop	Mocap		
Fonofos	Dyfonate		
Glyphosate	Roundup		
Imazaquin	Scepter		

Pesticide Results

Sample _____

Common Name	Trade Name	Concentration (ug/L)	Comments
Lindane	Lindane		
MCPA	MCPA		
Malathion	Malathion		
Methoxychlor	Methoxychlor		
Metolachlor	Dual		
Metribuzin	Sencor		
Parathion	Alkron		
Pendimethalin	Prowl		
Phorate	Thimet		
Picloram	Tordon		
Prometon	Pramitol		
Propachlor	Ramrod		
Quizalofop-ethyl	Assure		
Simazine	Princep		
Terbufos	Counter		
Toxaphene	Toxaphene		
2,4,5-TP	Silvex		
Triasulfuron	Amber		
Trifluralin	Treflan		

Notes _____

APPENDIX I

Pesticide Enforcement Action

Penalty Policy

SOUTH DAKOTA DEPARTMENT OF AGRICULTURE
September 1994
Revised March 1995

STATUTORY VIOLATIONS - ENFORCEMENT RESPONSE POLICY

Likely Violations originating from violation of South Dakota Law (SDCL)

38-21-14 Improper transportation, storage or disposal of pesticides

38-21-15 Pesticide handling causing injury or pollution prohibited
38-21-15.1 Operation of a Bulk Pesticide Storage Facility (BPSF) without a permit
38-21-15.2 Operation of a BPSF in violation ofpermit provisions

38-21-17 Commercial application without an applicator license,

38-21-23 Application of a Restricted-Use Pesticide without proper certification
38-21-40 Certification required for use of restricted-use pesticides

38-21-33.1 Operate without a Pesticide Dealer License

38-21-39.1 Unlicensed/uncertified purchase or sale of Restricted-Use Pesticides
38-21-39.2
38-21-39.3

38-21-44(2) Store, transport, apply, dispose or handle a pesticide inconsistent with the labeling

38-21-44(5) Operate in a faulty, careless or negligent manner

38-21-44(7) Failure to keep required application records

38-21-44(8) Falsify or make fraudulent records, invoices or reports

38-21-44(13) Aid or abet another person to evade provisions of this chapter

38-20A-4 Distribution of an unregistered pesticide

38-20A-17.1 Distribution of misbranded or adulterated pesticide
38-20A-26 Sale or distribution of misbranded or adulterated pesticide prohibited

38-20A-28 Distribution of an unregistered pesticide not in the manufacturer's original unbroken container

Likely Violations originating from legislation (Rules/ARSD) regarding Bulk Fertilizer and Pesticide Facilities

Fertilizer:
Article
12:44:05:27 Load, Mix and Wash Pads are required for all bulk commercial fertilizer dealers after February 1, 1992

12:44:05:28 Wash Water and Rinsates can not be disposed of through storm drains and runoff from the wash site is not allowed

12:44:05:07 Secondary Containment must meet professional engineering standards and hold 125% of the volume of the tanks within it's bounds

12:44:05:29 Spills must be reported to the SDDA or Emergency Disaster Services within 3 hours of the discharge

Pesticide:
Article
12:56:02 Pesticide storage & disposal

12:56:03 Pesticide transportation requirements
12:56:03:03 Containers must be secured to prevent significant movement during transportation

12:56:13 Bulk Pesticide Storage
12:56:13:01 Permanent Bulk Pesticide Storage Containers
12:56:13:02 Bulk Pesticide Storage Facility Construction
12:56:13:03 Secondary Containment Required
12:56:13:10 Manager must report spills to SDDA or EDS within 3 hours of when they occur

12:56:14 Pesticide handling and loading

12:56:17 Operational Area Containment
12:56:17:05 Sample analysis reports & soil disposition form to SDDA within 30 days of discharge

Enforcement Response Policy

Enforcement Options - Dependent upon the specific code violated

Stop Sale Order

Warning Letter

Enforcement Meeting

Suspend, Deny or revoke License or Permit

Injunctive Relief

Class II Misdemeanor

Class I Misdemeanor

Civil Penalty
In general...
-Commercial Applicator/Dealer/Wholesaler/Retailer -
Maximum $500 per day of violation
Maximum $5000 per violation
-Private applicator-
First violation: Warning unless the matrix calculates settlement offer of $1000 or more. If over $1000, the settlement will be reduced by 50%.
Second violation: Civil penalty settlement offer will be reduced by 50% of matrix value.
Third violation: Civil penalty settlement offer will be assessed according to matrix value.
Exception: In regard to purchase of restricted-use pesticides without proper certification, full matrix amount will be assessed.
-Penalty action in lieu of civil penalty-

Referral to U.S. Environmental Protection Agency

PENALTY RANGE MATRIX

TYPE OF VIOLATION	1st Offense	2nd Offense	3rd Offense
1. Misuse resulting in proven harm to:			
A. Humans			
1. Exposure, potential	100-500	250-1000	500-5000
2. Exposure, subacute illness	500-1500	1000-3000	5000
3. Exposure, chronic illness	2000-4000	3000-5000	5000
4. Death	5000	5000	5000
B. Livestock			
1. Residue preventing marketing of animal or its by-products	100-1000	500-2500	1000-5000
2. Illness			
a. under, equal to, 50 animals affected	100-1000	250-2000	500-5000
b. over 50 animals affected	100-1500	250-2500	500-5000
3. Death			
a. under, or equal to, 50 animals affected	200-2000	500-3000	1000-5000
b. over 50 animals affected	300-2500	500-3500	1000-5000
C. Crops			
1. Residue damage to crop	100-1000	250-2500	500-5000
2. Residue preventing/inhibiting/restricting marketing or consumption of all or part of the crop	100-1500	500-3000	1000-5000
3. Crop destroyed	300-2500	500-3500	1000-5000
D. Environment			
1. Water			
a. contamination causing harm to aquatic plants or animals	100-1000	250-2500	500-5000
b. contamination restricting use for intended purposes (ex: drinking, irrigation, etc.)	500-2500	750-5000	1000-5000
2. Soil			
a. Illegal residues preventing plant growth	100-1000	250-2500	500-5000
3. Animals			
a. Illness	100-500	250-1000	500-5000
b. Death	250-1000	500-2500	750-5000
c. Residues preventing/restricting consumption by humans	200-750	500-2000	750-5000
d. Bees or beneficial insects	100-1000	250-2500	500-5000
4. Plants other than crops			
a. Plants damaged, normal following season	100-1000	250-2500	500-5000
b. Plants damaged, abnormal following season	200-2000	300-3000	500-5000
c. Plants destroyed	200-2500	500-3500	1000-5000
2. Restricted-Use Pesticides (RUP)			
A. Licensed sale of RUP to non-certified individual (per sale)	50-500	100-1000	250-5000
B. Unlicensed sale of RUP	50-500	100-1000	250-5000
C. Non-certified purchase of RUP	50-150	100-300	250-500

PENALTY RANGE MATRIX (con't)

TYPE OF VIOLATION	1st Offense	2nd[1] Offense	3rd Offense
3. Record Keeping (Audits)			
A. RUP			
1. No RUP records kept	100-1000	250-2500	500-5000
2. RUP records not in compliance on 1-3 points	Warning	50-500	250-2500
3. RUP records not in compliance on 4-7 points	Warning	100-1000	250-5000
B. CAR			
1. No CAR records kept	50-150	100-400	200-800
2. CAR records not in compliance on 1-15 points	Warning	See attachment	See attachment
3. CAR records not in compliance on 16-19 points	100	See attachment	See attachment
4. License Violations [2]			
A. Commercial use of GUP without a license	Warning-600	250-2500	500-5000
B. Commercial use of RUP without a license	100-1000	500-3000	1000-5000
C. Private use of RUP without certification	Warning	50-1000	500-3000
D. Private use of GUP without certification	Warning	50-500	300-2500
E. Licensed application without correct category	50-500	100-1000	250-5000
5. Operating Bulk Pesticide Storage Facility without a permit	100-500/day	250-500/day	500/day
A. Operating in violation of permit provisions	Warning-500/day	Warning-500/day	500/day
6. Proven Use Violations			
A. Dilution Rate			
1. more than, or equal to, one half stated label amount	Warning	50-500	250-2500
2. less than one half stated label amount	50-150	100-500	300-3000
B. Unlabeled Site	Warning -1000	100-2500	500-5000
C. High Wind Speeds	100-1000	250-2500	500-5000
D. Other	100-1000	250-2500	500-5000
7. Violations of 38-21-44	100-1000	250-2500	500-5000

[1] Second and third offenses are based upon the violation history five years prior to the date the violation occurred. Applicator and dealer record content violations are based upon a three year enhancement period.

[2] License violations are assessed base penalty amount plus 2^{50}/application made (known only).

VIOLATION LEVEL[3] & BASE PENALTY MATRIX[4]

Type of violation	Base Penalty According to Offense Number		
	1	2	3
1. Misuse resulting in harm to:			
A. Humans			
1. Potential exposure	300	625	2750
2. Exposure, subacute illness	1000	2000	3000
3. Exposure, chronic illness	3000	4000	5000
4. Death	5000	5000	5000
B. Livestock			
1. Residue preventing marketing of animal or its by-products	550	1500	3000
2. Illness			
a. Under 50 animals affected	500	1125	2750
b. Over 50 animals affected	800	1375	2750
3. Death			
a. Under 50 animals affected	1100	1750	3000
b. Over 50 animals affected	1400	2000	3000
C. Crops			
1. Residue damage to crop	550	1375	2750
2. Residue preventing/inhibiting/restricting marketing or consumption of all, or part of crop	800	1750	3000
3. Crop destroyed	1400	2000	3000
D. Environment			
1. Water			
a. Contamination causing harm to aquatic plants or animals	550	1375	2750
b. Contamination restricting use for intended purpose (drinking, irrigation)	800	2875	3000
2. Soil			
a. Illegal residue preventing plant growth	550	1375	2750
3. Wildlife-Penalty consideration levied by GFP			
a. Illness	300	625	2750
b. Death	625	1500	2875
c. Residue preventing or restricting human consumption	475	1250	2850
d. Bees or beneficial insects	550	1375	2750
4. Plants Other than Crops			
a. Plants damaged-normal following season	550	1375	2750
b. Plants damaged-abnormal following season	1100	1650	2750
c. Plants destroyed	1350	1900	3000
2. Restricted Use Pesticides			
A. Licensed sale of RUP to non-certified individual (per sale)	275	550	2625
B. Unlicensed sale of RUP	275	550	2625
C. Non-certified purchase of RUP	100	200	375

[3] Private Applicators: The SDDA adopted the following adjustments for private applicators:
First violation: Warning unless the matrix calculates settlement offer of $1000 or more. If over $1000, the settlement will be reduced by 50%.
Second violation: Civil penalty settlement offer will be reduced by 50% of matrix value.
Third violation: Civil penalty settlement offer will be assessed according to matrix value.
Exception: In regard to purchase of restricted-use pesticides without proper certification, full matrix amount will be assessed.

[4] The SDDA may consider factors not included in the matrix either in favor or against individual involved in determining the civil penalty to be pursued.

VIOLATION LEVEL & BASE PENALTY MATRIX (con't)

Type of violation	Base Penalty According to Offense Number		
	1	2	3
3. Record Keeping[5]			
A. RUP			
1. No RUP records kept	550	1375	2750
2. RUP records not in compliance on 1-3 points	Warning/50	275	1375
3. RUP records not in compliance on 4-7 points	Warning/50	550	2625
B. CAR			
1. No CAR records kept	100	250	500
2. CAR not in compliance on 1-15 points	Warning	see attachment	
3. CAR not in compliance on 16-19 points	100	see attachment	
4. License Violations[6]			
A. Commercial use of GUP without a license	300	1375	2750
B. Commercial use of RUP without a license	550	1750	3000
C. Private use of GUP without certification[7]	Warning	525	1750
D. Private use of RUP without certification	Warning	275	1400
E. Licensed application without correct category	275	550	2625
5. Operating Bulk Pesticide/Fertilizer Storage Facility without a permit (ARSD 12:44 and 12:56 violation) *Base on days of operation while in violation, economic gains from non-compliance, size of business, & cleanup costs*			
A. Non-reported spill	Warning to $500		
B. Operating in violation of permit provisions	civil penalty per day		
C. Operating without wash/rinse pad or secondary containment as required			
6. Proven Use Violation			
A. Dilution Rate			
1. > or = ½ stated label amount	Warning	275	1375
2. < ½ stated label amount	100	550	1650
B. Unlabeled Site	500	800	3000
C. High Wind Speeds	500	1375	2750
D. Other	500	1375	3000
7. Violations of 38-21-44	500	1375	3000

[5] Record violations include all record violations within the past 3 years, whereas all other types of violations include violations within the last 5 years.

[6] License violations area assessed base penalty amount plus $2[50]/application made (known only).

[7] Violation if over $1,000 of gross agricultural sales potential.

GRAVITY ADJUSTMENT CHART[8]

Violation	Value	Circumstances
GRAVITY OF HARM- Pesticide	2	Toxicity - Category I pesticides; restricted use Signal word "Danger, "Flammable"; "Extremely Flammable"; flammable/explosive characteristics; associated with chronic health effects (mutagenicity, oncogenicity, teratogenicity, etc.)
	1	Toxicity - Category II through IV pesticides; Signal word "Warning", "Caution"; No known chronic effects
GRAVITY OF HARM- Harm to Human Health	5	Actual serious or widespread harm to human health.
	3	Potential or widespread harm to human health.
	2	Minor potential or actual harm to human health, neither serious nor widespread.
	1	Harm to human health is unknown.
	0	No harm to human health.
GRAVITY OF HARM- Environmental Harm	5	Actual serious or widespread harm to the environment (i.e. crops, water, livestock, wildlife, wilderness, or other sensitive natural areas)
	3	Potential serious or widespread harm to the environment.
	2	Minor potential or actual harm to the environment neither widespread or substantial.
	1	Harm to the environment is unknown.
	0	No harm to the environment.
GRAVITY OF MISCONDUCT- Compliance History * Based upon violation history 5 years prior to date violation occurred; except for application record content violations, which have a 3 year enhancement period.	5	If a violator is a commercial applicator or dealer with more than 2 violations. Or if a violator is a private applicator with more than 3 prior violations.
	3	If a violator is a commercial applicator or dealer with more than 1 violation. Or if a private applicator has more than 2 violations.
	2	If a violator is a commercial applicator or dealer with one violation.
	1	If a violator is a private applicator with one prior violation.
	0	No prior violations.
GRAVITY OF MISCONDUCT- Culpability	4	Knowing and willful violation of the statute. Knowledge of the general hazardousness of the action.
	2	Violation resulting from negligence.
	1	Culpability unknown.
	0	Violation was neither knowing nor willful and did not result from negligence. Violator instituted steps to correct the violation immediately after discovery of the violation.

[8] Use Gravity Adjustment Chart to determine Gravity Values.

PERCENT GRAVITY ADJUSTMENT CRITERIA

TOTAL GRAVITY ADJUSTMENT	ENFORCEMENT REMEDY
0-2	No action, Notice of warning, or % Reduction of matrix value[9]
3	*Reduce* matrix value **50%**
4	*Reduce* matrix value **40%**
5	*Reduce* matrix value **30%**
6	*Reduce* matrix value **20%**
7	*Reduce* matrix value **10%**
8 to 12	Assess matrix value
13	*Increase* matrix value **10%** [10]
14	*Increase* matrix value **15%**
15	*Increase* matrix value **20%**
16	*Increase* matrix value **25%**
17 or above	*Increase* matrix value **30%**

[9] 50% reduction of matrix values is recommended where multiple count violations exist.

[10] Matrix values can only be increased to the statutory maximum.

CIVIL PENALTY CALCULATION WORKSHEET

CASE NUMBER: _____

RESPONDENT: _____

ADDRESS: _____

_____

COMPANY/OCCUPATION: _____

PREPARED BY: _____ DATE: _____

	Count 1	Count 2	Count 3	Count 4
1. Statutory Violation				
2. Violation Level				
3. Base Penalty	$	$	$	$
4. Gravity Adjustments				
a. Pesticide Toxicity				
b. Human Harm				
c. Environmental Harm				
d. Compliance History				
e. Culpability				
f. Total Gravity Value				
5. Penalty Adjustment				
a. Percent Adjustment	%	%	%	%
b. Dollar Adjustment	$	$	$	$
6. Count Penalty (#3 - #5b)	$	$	$	$
7. Final Penalty Assessment				
a. TOTAL COMBINED PENALTY (Count 1 + Count 2 + Count 3 + Count 4)				$

PREVIOUS VIOLATIONS				
Date	Case #	Type	Violation	Penalty

COMMENTS:

COMMERCIAL APPLICATOR RECORDS

Penalty Matrix Worksheet

Respondent:_____ License #:_____

Address:_____

_____

Company/Occupation:_____

	Audit Date_____ Points Deficient	Audit Date_____ Points Deficient	Audit Date_____ Points Deficient
1) Name of Customer			
2) Address of Customer			
3) Location			
4) Pest Treated			
5) Area Treated			
6) Date Applied			
7) Time Applied			
8) Firm Name			
9) Trade or Brand Name			
10) Common Name			
11) Company Name			
12) Wind Direction			
13) Wind Velocity			
14) Temperature			
15) Amount Applied			
16) Total Volume			
17) Crop Treated			
18) Name of Applicator			
19) Address of Applicator			
TOTAL POINTS			

Are any of the same items deficient as the previous audit with no improvement in points?
Yes ____ No ____

Penalty (per matrix): _____

Adjusted Penalty: _____

Penalty to be pursued: _____

By: _____

Date: _____

PENALTY MATRIX[11]

COMMERCIAL APPLICATOR RECORDS

	Points Deficient	First Offense	Points Deficient	Second Offense	Points Deficient	Third Offense
No Records	--	100	--	250	--	500
Records Deficient	16-19	100	16-19	250	16-19	500
	1-15	Warning	11-15	100	11-15	250
			5-10	50	5-10	100
			1-4	Warning[12]	1-4	50[13]

The above penalty matrix should not be interpreted to mean the department cannot pursue an enforcement action or penalty different from those in the matrix, when circumstances would indicate such deviation is prudent.

[11] Violative audits that were conducted within the three years prior to a current violative audit will be considered prior offenses for the purposes of penalty determination. The matrix above is based upon the number of points deficient. Any individual record item, as listed on page 13, that is more than 50%, but less than 100% in compliance, shall count as 1/2 point. Any individual record item, as listed on page 13, that is less than 50% in compliance shall count as 1 point.

[12] When a second violative audit indicates no improvement in points has been made from the previous audit and one or more of the items deficient is the same as on the first violative audit, a $50 civil penalty shall apply to the 1-4 Points Deficient category.

[13] On the third violative audits, a $100 civil penalty shall apply under the same circumstances.

PENALTY MATRIX

COMMERCIAL APPLICATOR RECORDS

BREAKDOWN OF COMMERCIAL APPLICATOR RECORD REQUIREMENTS

1) Name of the person for whom the pesticide was applied
2) Address of the person for whom the pesticide was applied
3) Location of the land or property where the pesticide was applied
4) The pest to be treated
5) The acreage, area or number of plants or animals treated or other appropriate description
6) Date the pesticide was applied
7) Time the pesticide was applied
8) Person or firm who applied the pesticide
9) Trade or brand name of the pesticide applied
10) Common name of the pesticide applied
11) Company name appearing on the product label
12) Wind direction
13) Wind velocity
14) Temperature
15) Amount of the pesticide applied
16) Total volume applied per unit
17) Crop, site or commodity treated
18) Name of the applicator
19) Address of the applicator

Effective Date: _____

By: _____

APPENDIX J

TRIBAL AND BORDERING STATE AGREEMENTS

No agreements at this time.

APPENDIX K

COMMERCIAL APPLICATOR SUMMARY FORM

This record applies to the following applicators:

Name as listed on license: _____ License #: _____ Company: _____

_____ _____

_____ _____

_____ **I/we did not apply pesticides in 199___.**

COMMERCIAL APPLICATOR SUMMARY FORM 199___.

County	EPA Reg. # or Pesticide Trade Name	Common Name	Concentration of Active Ingredient	Crop/Site	Total Area	Major Target Pest	Rate of Purchased Chemical Per Area	Ground or Aerial

Reverse Side (Examples of a correctly completed form)

County	EPA Reg. # or Pesticide Trade Name	Common Name	Concentration of Active Ingredient	Crop/Site	Total Area	Major Target Pest	Rate of Purchased Chemical Per Area	Ground or Aerial
PT	2548-59			wheat(rail cars)	33,000 bu.	Flour beetles	136gm/ 1000 bu	G
BK	485-47			Structural Sites		Flour Beetles	144 oz used	G
MY	Dursban 4E	Chlorpyrifos	44.4%	Structural Sites		crawling insects	8 gal used	G
MA	524-296			corn	200A	Foxtail	2 qt/A	G
MA **	LASSO II	Alachlor	4#/gal	corn	200A	Foxtail	2 qt/A	G
UN	Pinnacle	Trifensulfuron	25DF	soybeans	143A	Russian Thistle, Pigweed	.25 oz/A	G
BK	34704-125			Pastures	350A	Thistles	1 qt/A	A
BK **	Clean Crop LV 6	2,4-D	5.6#/gal	Pastures	350A	Thistles	1 qt/A	A
DG	62719-23			Sorghum	101A	Greenbugs	.5 lb/A	A
CD	34704-131			Turf	6.3A	Clover	1 qt/A	G
UN	Terraclor	PCNB	75% WP	Bentgrass	36.6A	Gray Snow Mold	8 lb/A	G
GT	524-351			right of way	20A	Bindweed, thistle	54 oz/A	G
HN	3008-56			Poles	3500 pole	Pole Decay	2 lb/pole	G
MA	Cythion	Malathion	91%	bike trl, ball pk	Entire City	Mosquitos	13 gal used	G
MY	Prometon	Prometon	2#/gal	Parking lots	7A	vegetation kill	2 gal/A	G
CM	13808-6			Rangeland	450A	Prairie Dogs	1 lb/A	G
CM **	Zinc Phosphide	Zinc Phosphide	2%	Rangeland	450A	Prairie Dogs	1 lb/A	G
TU	10088-13-55127			Stabliz. Pond	32A	Submrg. Weeds	10 lb/A	G

Column 1: County of Application
Column 2: List EPA Registration Number then skip columns three and four **or** list pesticide trade name
** This example is a more difficult form of the one directly above it. For your convenience and ours, please use the EPA Reg. #.
Column 3: Common Name: (if not listing EPA Reg. #) Examples: Alachlor, Glyphosate, 2,4-D, or Trifluralin.
Column 4: Concentration: (if not listing EPA Reg. #) Active Ingredient in % or pounds/gallon, etc.
Column 5: Crop/Site: BE SPECIFIC, Example: wheat, oats, barley, **NOT** small grains.
Column 6: Total Area: Use acres, square feet, bushels, number of trees, poles, structures, etc. sprayed.
Column 7: Major Target Pest: BE SPECIFIC -Examples: Field bindweed, Foxtail, Grasshoppers, Rust, Thistles
Column 8: Rate of Application of purchased chemical per area-Examples: 1 quart/Acre, 1cc per tree, 3 oz per home
Column 9: How Application was made (Ground [G] or Air [A])

APPENDIX L

COOPERATIVE EXTENSION SERVICE – FACT SHEETS AND WORKSHEETS

FACT SHEETS AND WORKSHEETS

This appendix lists the fact sheets and worksheets available from the Cooperative Extension Service. The information in these publications covers a wide variety of subject matter. They range from ground water protection to alternative pesticide use. Over 35 pesticide or ground water related publications are available.

ESS 33 FARM*A*SYST
AUTHOR: R. Derickson
ABSTRACT: Ten **FREE** worksheets will help you assess the groundwater pollution of your farmstead structures and activities:
WATER QUALITY - COVER SHEET
WATER QUALITY - INTRODUCTION

STEP 1 -
1. Drinking Water Well Condition - Worksheet
2. Pesticide Storage and Handling - Worksheet
3. Fertilizer Storage and Handling - Worksheet
4. Petroleum Product Storage - Worksheet
5. Hazardous Waste Management - Worksheet
6. Household Wastewater Treatment - Worksheet
7. Livestock Waste Storage - Worksheet
8. Livestock Yards Management - Worksheet
9. Silage Storage - Worksheet
10. Milking Center Wastewater Treatment - Worksheet

STEP 2 -
11. Helps you assess how your soil and geologic features affect groundwater pollution potential on your farmstead

STEP 3 -
12. An overall evaluation-combines the results of steps 1 and 2, allowing you to:
    - Look at each potential source of contamination in light of your particular site conditions.
    - Compare potential contamination sources to see where improvements are most needed.
    - Determine where to spend your time and money most effectively to protect the groundwater that provides your drinking water supplies.

WATER QUALITY USER EVALUATION
WATER QUALITY REFERENCES

ESS 43 HOME*A*SYST
AUTHOR: R. Derickson
ABSTRACT: A series of five 8-page fact sheets;
COVER
A - SITE ASSESSMENT
B - HOUSEHOLD WASTEWATER
C - DRINKING WATER WELL MANAGEMENT
D - MANAGING HAZARDOUS HOUSEHOLD PRODUCTS
E - LIQUID FUELS

FS 860 Chemigation
AUTHOR: Cooperative Extension Service
ABSTRACT: Discusses equipment selection and installation and system management for irrigation systems. 1990. 6p. * Free.

EC 897 Checkbook Irrigation Scheduling
AUTHOR: H. Werner
ABSTRACT: A way for you to plan irrigation water application. 1993. 32p. * Free.

FS 862 Chemigation Management
AUTHOR: H. Werner
ABSTRACT: Aids the operator in his responsibility to ensure that safety equipment is installed, that it's functioning properly, and the system is calibrated to apply the right amount of chemical with the water. 1991. 4p. * Free.

FS 861 Chemigation Is It For You?
AUTHOR: H. Werner
ABSTRACT: Helps you consider all the advantages and disadvantages before making a chemical application decision. 1991. 4p. * Free.

FS 863 Chemigation-Calibrating Systems For Center Pivot
AUTHOR: H. Werner
ABSTRACT: Covers procedures for calibrating chemigation when using center pivot irrigation machines. 1993. 6p. * Free.
FS 866 Will It Wash?
AUTHOR: H. Werner
ABSTRACT: Reduce surface runoff to safe levels by changing your tillage practices. 1991. 2p. * Free.

FS 876 Measuring Soil Moisture For Irrigation Management
AUTHOR: H. Werner
ABSTRACT: Information on measuring soil moisture and monitoring soil moisture levels for irrigation management. 1992. 2p. * Free.

FS 878 Agriculture's Impact On Groundwater In South Dakota
AUTHOR: G. Carlson, J. Bischoff & C. Ullery
ABSTRACT: Agricultural management practices, movement of agricultural chemicals through the soil, and the impact of agricultural chemicals on human health. 1992. 8p. * Free

FS 891 Plugging Abandoned Water Wells
AUTHOR: R. Derickson & J. Siegel
ABSTRACT: Identifying and locating wells, laws concerning, well plugging materials, aquifers, and cost. 1994. 8p. * Free.

FS 899 Irrigation Management - Using Electrical Resistance Blocks To Measure Soil Moisture
AUTHOR: H. Werner
ABSTRACT: Locating moisture blocks, placing blocks in soil, preparing & installing - also care, cost and suppliers. 1995. 4p. * Free.

FS 525A Weed Control in Small Grain, Flax, and Millet: 1996
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: Herbicide suggestions. 1996. 16p. * Free.

FS 525D Weed Control in Sorghum: 1996
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: Herbicide suggestions. 1996. 10p. * Free.

FS 525L Weed Control in Forage Legumes
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: Herbicide suggestions. 1996. 8p. * Free.

FS 525 OS Weed Control in Oilseed Crops: 1996 Sunflower. Safflower, Canola, and Flax
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: Herbicide suggestions. 1996. 8p. * Free.

FS 525P Weed Control in Grass Pasture & Range
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: A summary of herbicide uses and does not imply a guarantee.

FS 525N Noxious Weed Control
AUTHOR: L. Wrage & P. Johnson
ABSTRACT: Herbicide suggestions. 1996. 15p. * Free.

FS 888P Insect Control In Forage and Pasture
AUTHOR: M. McLeod
ABSTRACT: Pest and insecticide control. 1995. 5p. * Free.

FS 877A Treatment Systems For Household Water Supplies - Activated Carbon Filtration
AUTHOR: B. Seelig, G. Bergsrud & R. Derickson
ABSTRACT: Water containments removed by activated carbon filters, water testing, the activated carbon filtration process & activated carbon filtration equipment. 1992. 6p. * Free.

FS 877D Treatment Systems For Household Water Supplies - Distillation
AUTHOR: R. Derickson, B. Seelig & F. Bergsrud
ABSTRACT: What impurities will distillers remove and not remove; the distillation process; types of equipment and maintenance & operation costs, also advantages and disadvantages of distillers. 1992. 6p. * Free.

FS 877P Treatment Systems For Household Water Supplies - Identifying and Correcting Water Problems
AUTHOR: T. Scherer & R. Derickson
ABSTRACT: Identifying problems; correcting the water problem, and common water treatment methods. 1992. 4p. * Free.

EXEX 1008 Richmond Lake Water Quality Project Citizen's Guide to Environmental Terminology
AUTHOR: J. Schumacher
1990. 8p.

EXEX 1009 Richmond Lake Water Quality Project Septic Systems on Shoreline Property
AUTHOR: J. Schumacher
1990. 2p.

EXEX 1016 Managing Lawns To Protect Water Quality - Watering, Fertilizing, and Applying Pesticides
AUTHOR: C. Johnson, J. Gerwing, D. Graper. & J. Wilson
1992. 4p.

EXEX 1017 Plugging Abandoned Wells
AUTHOR: R. Derickson
1993. 2p.

EXEX 1025 Drinking Water Standards - Primary Drinking Water Standards
AUTHOR: R. Derickson
1995. 2p.

EXEX 1026 Drinking Water Standards - Secondary Drinking Water Standards
AUTHOR: R. Derickson
1995. 2p.

EXEX 1027 Drinking Water Standards - Health Advisory Levels
AUTHOR: R. Derickson
1995. 4p.

EXEX 1028 Drinking Water Standards - Household Water Treatment Equipment
AUTHOR: R. Derickson
1995. 3p.

EXEX 8078 Pesticide Container Disposal And Recycling
AUTHOR: J. Wilson
1992. 2p.

EXEX 8091 Waste Pesticides - Proper Storage, Handling, and Disposal
AUTHOR: J. Wilson
1993. 2p.

EXEX 8109 Handling Pesticides Properly
AUTHOR: J. Wilson
1995. 4p.

EXEX 6012 Pest Control Alternatives - A practical guide to the control of garden pests through sound management and alternative pesticides.
AUTHOR: D. Graper, M. McLeod & J. Wilson
1992. 5p.

EXEX 8053 Herbicide Directory
AUTHOR: P. Johnson
1989. 3p.
EXEX 8054 Toxicity Of Pesticides
AUTHOR: P. Johnson & L. Wrage
1989. 4p.

APPENDIX M

SOUTH DAKOTA STATE UNIVERSITY – REFEREED PUBLICATIONS

REFEREED PUBLICATIONS

Koskinen, W. C. and S.A. Clay. Atrazine persistence and fate in north central U.S. soils and factors affecting its potential for ground water contamination. Pesticide Review (In preparation).

Clay, S. A., T.B. Moorman, D.E. Clay, and K.A. Scholes. Sorption and degradation of alachlor in soil and aquifer material. J. Environ. Qual. (In review).

Clay, S. A., K. Brix-Davis, D.E. Clay, and T.E. Schmacher. Agrichemical management, movement, and maize yield: ridge-till vs. chisel plow. J. Prod. Ag. (In review).

Clay, S. A., D.E. Clay, Z. Liu, and S.S. Harper. 1996. The effect of ammonia on atrazine sorption and transport. In Meyer, M.T. and E.M. Thurman (eds) herbicide metabolites in surface water and groundwater. ACS Symposium Series. Washington, D.C. 630:117-124.

Liu, Z., S.A. Clay, D.E. Clay, and S.S. Harper. 1995. Ammonia impacts on atrazine leaching through undistributed soil columns. J. Environ. Qual. 24:1170-1173.

Liu, Z., S.A. Clay, D.E. Clay, and S.S. Harper. 1995. Ammonia fertilizer influences atrazine adsorption-desorption characteristics. J. Ag. Food. Chem. 43:815-819.

Clay, S. A., W.C. Koskinen, and J.M. Baker. 1995. Alachlor and metolachlor movement during winter and early spring in three midwestern sites. J. Environ. Health part B30:637-650.

Clay, S. A., K.A. Scholes, and D.E. Clay. 1994. Fertilizer shank placement impact on atrazine movement in a ridge tillage system. Weed Sci. 42:86-91.

Clay, S. A., D.E. Clay, W.C. Koskinen, and G. Malzer. 1992. Surface microrelief impact of alachlor and nitrate movement through soil. J. Environ. Sci. Health B 27:125-138.

Clay, S. A., W.C. Koskinen, and P. Carlson. 1991. Alachlor movement through intact soil core taken from two tillage systems. Weed Tech. 5:485-489.

Clay, S. A., R.R. Allmaras, W.C. Koskinen, and D.L. Wyse. 1988. Desorption of atrazine and cyanazine from soil. J. Environ. Qual. 17:719-723.

Clay, S. A. and W.C. Koskinen. 1990. Adsorption and desorption of atrazine, hydroxyatrazine, and S-gluthathione on two soils. Weed Sci. 38:262-266.

Clay, S. A. and W.C. Koskinen. 1990. Characterization of alachlor and atrazine desorption from soils. Weed Sci. 38:74-80.

Clay, S. A., W.C. Koskinen, R.R. Allmaras, and R.H. Dowdy. 1988. Differences in herbicide adsorption on soil using several soil pH modification techniques. J. Environ. Sci. Health B23:559-573.

Clay, S.A., D. E. Clay, K. A. Brix-Davis, T. Moorman, and K.A. Scholes. 1995. Alachlor and atrazine fate in the soil profile. American Chemical Society Meeting. Anaheim, CA.

DeSutter, T.M., D.E. Clay, and S. A. Clay. 1995. Agrichemical movement with wind eroded sediment. WEPP/WEPS-The new generation of water and wind erosion prediction technology. Soil and Water Conservation Symposium. Des Moines, IA.

Holman, P.W., D.E. Clay, A.R. Bender, S. A. Clay, and T.E. Schumacher. 1993. Aquifer sampling with a surface skimming device. Proceedings of the Soil Water Conservation Society, Water Quality meeting. March, 1993. Minneapolis MN.

Clay, S. A., K.A. Scholes, and D.E. Clay. 1993. Herbicide movement affected by agrichemical placement in a ridge tillage system. Proceedings of the Soil Water Conservation Society, Water Quality meeting. March, 1993. Minneapolis MN.

Clay, D.E., S. A. Clay, K. Brix-Davis, and K.A. Scholes. 1993. Nitrate movement affected by agrichemical placement in a ridge tillage system. Proceedings of the Soil Water Conservation Society, Water Quality meeting. March, 1993. Minneapolis, MN.

Zhoujing, L., Clay S. A., D.E. Clay, and S.S. Harper. 1993. Ammonia based fertilizer influence on adsorption of atrazine. Proceedings of the Soil Water Conservation Society, Water Quality meeting. March, 1993. Minneapolis, MN.

Clay, S. A., K.A. Scholes, and D.E. Clay. 1993. Fertilizer Shank placement impact on atrazine movement in a ridge tillage system. Agricultural Research to Protect Water Quality. Proc. of Conf. Minneapolis, MN.

Liu, Z., S.A. Clay, D.E. Clay, and S.S. Harper. 1993. Anhydrous ammonia influence on atrazine adsorption to soil. Agricultural Research to Protect Water Quality. Proc. of Conf. Minneapolis, MN.

APPENDIX N

SOUTH DAKOTA STATE UNIVERSITY - UNIVERSITY COURSES

This appendix contains a list of courses from South Dakota State University that relate to agricultural water quality topics.

Course Identification Number	Credits	Course Description
AE 434	4	Soil and Water Engineering
AST 333	3	Soil and Water Mechanics
AST 463	3	Agricultural Waste Management
Bio 375	3	Water Quality in Agriculture
CEE 327	3	Water Supply Engineering
CEE 333	3	Hydrology
CEE 423	3	Waste Water Engineering
CEE 724	3	Land Treatment of Wastes
CEE 734	3	Surface Water Quality Modeling
Chem 380	3	Environmental Chemistry
Econ 472/572	3	Resource and Environmental Economics
Geog 487	1-4	Geographical Information Systems
Micr 310	4	Environmental Microbiology
PS 213	3	Soils
PS 243	3	Geology
PS 307	3	Insect Pest Management
PS 323	3	Soil Fertility and Fertilizers
PS 343	3	Weed Science
PS 362	3	Environmental Soil Management
PS 375	3	Water Quality in Agriculture
PS 483	3	Irrigation-Crop and Soil Practices
PS 412/512	3	Soil Chemistry
PS 700	2	Surface and Ground Water Protection
PS 743	3	Physical Properties of Soils
Rang 205	3	Introduction to Range Management
Rang 415	3	Range Improvement and Grazing Management
WL 110	2	Environmental Conservation
WL 370	3	Limnology