

Water Quality Best Management Practices Manual



TSSWCB

Texas State Soil & Water Conservation Board

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Dear "Fellow Texans,"

As agriculture is subject to mounting environmental pressures, the Texas State Soil and Water Conservation Board (TSSWCB) is addressing this challenge by working with producers through its vast network of local soil and water conservation districts, and by educating urban citizens on the water quality improvement efforts that are taking place on rural land. It is important that urban residents and those unfamiliar with farming gain insight into the problems farmers face and the steps they are taking to help make Texas a cleaner, healthier place to live. Steps to protect water quality and natural resources on agricultural lands begins at the producer-level. While the outcomes of environmental stewardship are far reaching, they often go unnoticed. For example, flood control structures, and pesticide and sediment control issues all have serious implications for urban water supplies, yet the general public often does not have an understanding of how these practices can impact the quality of their drinking water.

This manual presents some of the best management practices (BMPs) that are available for producers to implement in order to be better stewards of the land. I hope that you find this material useful and that it aids your understanding of natural resource issues in Texas. Through effective communication and cooperation with landowners and/or producers, soil and water conservation districts, state and federal agencies, the Texas Legislature, and the general public, the TSSWCB looks forward to addressing the State's most pressing natural resource concerns. The Texas State Soil and Water Conservation Board challenges you to become involved in doing your part to protect the future of the great State of Texas.

Sincerely,

Rex Isom

TSSWCB Executive Director



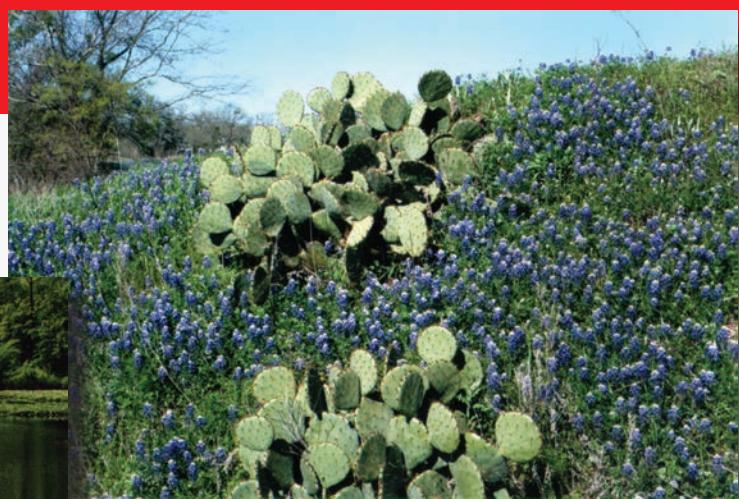




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Introduction



Rural America is changing rapidly in the 21st century as urban residents migrate to the countryside in search of open space, fresh air, increased recreational opportunities and, in general, a less stressful, more relaxed lifestyle (Libby, 2001). Rural living is easier and more convenient today than at any time in our nation's history. Federal highway expansion brings the countryside closer, sewer and water systems make rural living more manageable, and the Internet, digital satellite, and other state-of-the-art technologies facilitate communication at the touch of a button (Libby, 2001). Not surprisingly, however, the new face of rural America has also created tension at the rural-urban fringe. Recently constructed homes and businesses inevitably increase contact between new residents and traditional rural land uses such as agriculture and forestry.

Few will dispute that agricultural production provides one of America's biggest water quality challenges in the 21st century (Libby,

2001). While agricultural operations are not necessarily major polluters, point sources of pollution have largely been addressed, leaving agriculture, forestry, and other non-point sources as a primary barrier to achieving water quality objectives (Libby, 2001). Agricultural operations, particularly those near the rural-urban interface, are the focus of an environmental spotlight. Many agricultural operations are highly visible, and today more than ever, their link to water quality is something easily understood by a more informed and knowledgeable citizenry.

The Texas State Soil and Water Conservation Board (TSSWCB) has assembled this comprehensive collection of conservation practices, or best management practices (BMPs), to assist landowners and/or producers in preventing nonpoint source pollution. While TSSWCB has traditionally focused on agriculture and other rural land uses, it administers or shares responsibility for a number of natural resource and water qual-



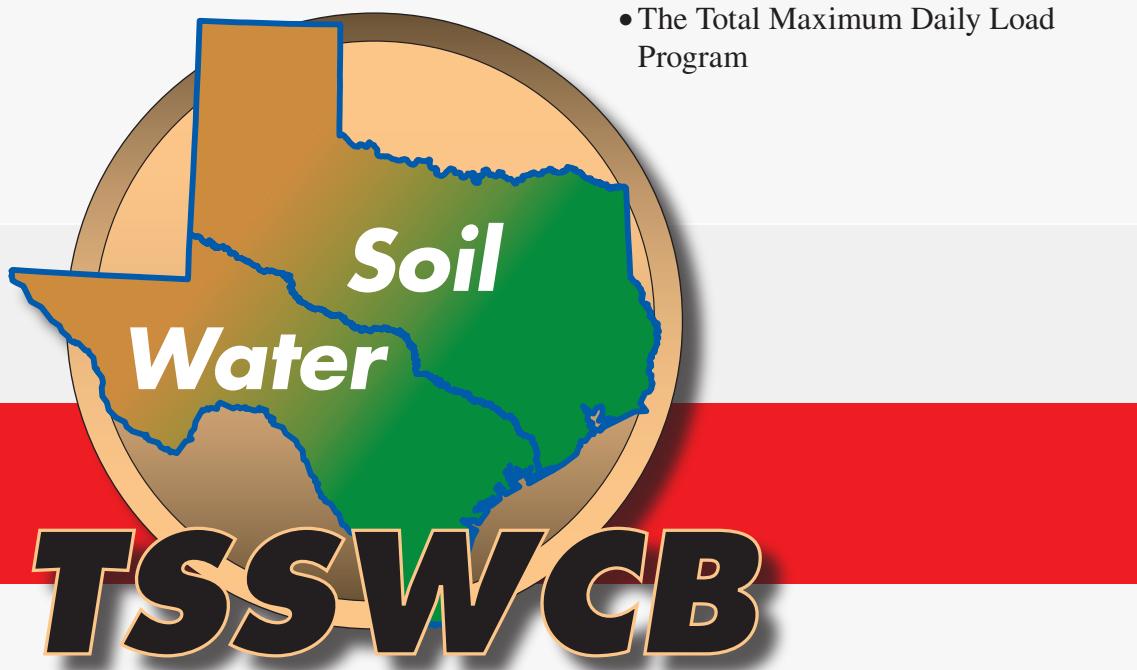
ity programs that enhance the quality of life for all Texans. The practices found in this handbook benefit agricultural producers, rural residents, transplanted urban residents, and city dwellers alike by protecting surface and groundwater quality in the State of Texas.

A Look at the Texas State Soil and Water Conservation Board

From its headquarters in Temple, TSSWCB is actively involved in a number of programs de-

While the Brush Control Program addresses an important natural resource concern, the conservation practices outlined in this handbook are specifically designed to address a separate, yet equally important issue—the protection and enhancement of surface and groundwater quality. The TSSWCB plays a vital role in several programs that have a direct impact on water quality, most notably:

- The Water Quality Management Plan Program
- The Clean Water Act Section 319 Grant Program
- The Total Maximum Daily Load Program



signed to protect and enhance the state's natural resources—from prevention of soil erosion, to coastal management, to wildlife conservation, to landowner education, and many others. As one example, the TSSWCB's Brush Control Program was designed to enhance water availability by removing the water depleting brush and trees that have invaded the state's grazing land. The TSSWCB achieves this objective by developing management strategies for designated areas where brush control is most needed. Since 1985, TSSWCB has worked closely with state and federal agencies to effectively implement this program.

The Water Quality Management Plan Program

In 1993, the Texas Legislature passed Senate Bill 503, which made TSSWCB the lead agency for activities designed to abate agricultural and silvicultural nonpoint source pollution. The legislation also directed the TSSWCB to develop and implement Water Quality Management Plans (WQMPs). The TSSWCB

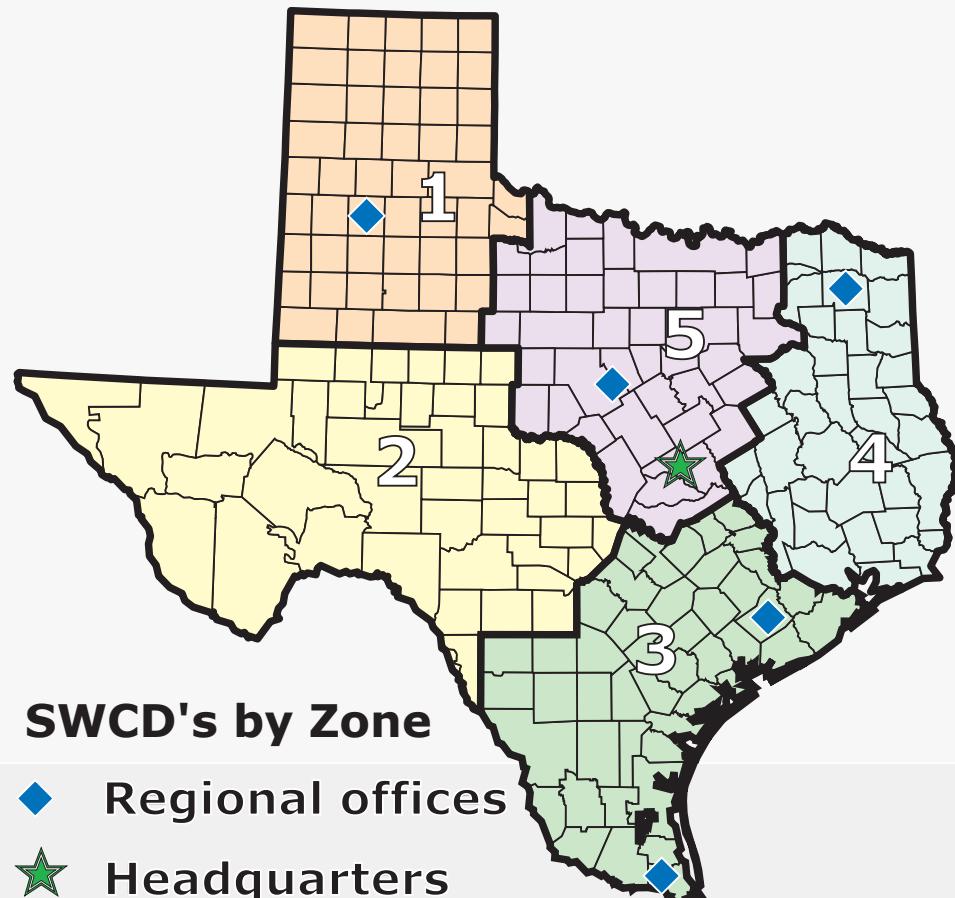


performs this function in coordination with the state's 217 local soil and water conservation districts (SWCDs), which are political subdivisions of the state. Board members are selected by agricultural landowners in local elections. The districts generally reflect county boundaries but, in some cases, may follow river basin or watershed boundaries. The local SWCD's administer the WQMP program at the local level. They work with landowners and/or producers to implement conservation practices on their land. To contact your local SWCD for information on assistance refer to Appendix I.

A WQMP is a site-specific conservation plan developed and approved by SWCDs for agricultural and silvicultural lands. Its purpose is to achieve a level of pollution prevention

or abatement that is consistent with state water quality standards. The requirements contained in a WQMP are based on criteria outlined in the Field Office Technical Guide, a publication of the U.S. Department of Agriculture's Natural Resources Conservation Service.

Water Quality Management Plans can be particularly useful in addressing animal feeding operations, such as unpermitted dairy facilities. WQMPs are developed with practices that individually, or in combination with others, properly manage animal waste and waste application. WQMPs can also include sub-components for irrigation water and erosion control and are flexible enough to cater to a wide range of operating systems.





Since the program began in 1993, TSSWCB has certified the technical adequacy of more than 8,400 WQMPs.

The Clean Water Act Section 319 Grant Program

Recognizing the need for greater federal leadership to help focus State and local nonpoint source efforts, Congress amended the CWA in 1987 to enact the section 319 nonpoint source management program. Section 319 established a grant that Congress awards annually to the U.S. Environmental Protection Agency (EPA), which then allocates the funds among states to implement activities to achieve CWA goals. In Texas, section 319 grant funds are divided between TSSWCB and the Texas Commission on Environmental Quality (TCEQ). These agencies are responsible

for maintaining a statewide management program that satisfies section 319 requirements.

The TSSWCB reviews section 319 grant proposals to ensure funds are directed to the most effective, high quality nonpoint source projects. The agency ultimately awards grants in support of a wide variety of activities including technical assistance, education and training, technology transfer, demonstration projects, watershed planning activities, and monitoring to assess the progress of nonpoint source programs. Section 319 grant funds are also used to develop Total Maximum Daily Loads (TMDLs) and to implement management practices that support restoration goals established in TMDLs.

The section 319 program has successfully addressed a variety of nonpoint source



challenges. For example, the TSSWCB has helped implement BMPs that address non-point source pollution from forestry activities, through voluntary participation of local foresters, landowners, and silvicultural contractors. Educational efforts have reached approximately 20,000 people and evaluations show an 88 percent BMP implementation compliance rate (EPA, 2003). Overall, forestry BMPs have reduced stream sedimentation by approximately 40 percent (EPA, 2003).

The Total Maximum Daily Load Program

The Total Maximum Daily Load program was created by section 303(d) of the CWA, the same piece of legislation that created the National Pollutant Discharge Elimination System (NPDES), which has been so effective in curbing point source pollution. Section 303(d) requires states to:

- Identify waters that are and will remain polluted (water quality standards not achieved) after the application of technology based activities associated with point sources.
- Prioritize the waters, taking into account the severity of their pollution.
- Establish total maximum daily loads for the waters at levels necessary to meet applicable water quality standards.

Stated simply, a TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Thus, a TMDL specifies the amount of a particular pollutant that may be present in the impaired water body, allocates allowable pollutant loads among sources, and provides

the basis for attaining and maintaining water quality standards.

In Texas, responsibility for TMDLs is shared between the TSSWCB and the Texas Commission on Environmental Quality (TCEQ). Although, in general, TCEQ is the lead agency for protecting water quality, it shares responsibility for managing nonpoint source pollution with TSSWCB, the lead agency for nonpoint source pollution related to agricultural and silvicultural activities. Accordingly, TMDLs for water bodies impaired by agricultural or silvicultural non-point source pollution must be coordinated between TCEQ and TSSWCB.

The TSSWCB is currently involved in the development and implementation of a number of TMDLs for water bodies that are impaired, at least in part, by agricultural activities. These TMDLs, which primarily address dissolved oxygen, nutrients, bacteria, Atrazine, and salinity, are implemented using CWA section 319 grant funds and state WQMP program funds.

Final Thoughts

As described above, the TSSWCB is responsible for a number of natural resource and water quality programs. Although these programs primarily target rural farmers and ranchers, the results of TSSWCB activities benefit all Texans by protecting urban drinking water supplies and enhancing the quality of outdoor recreational activities. Flood control structures, for example, protect heavily populated areas from flood damage and prevent the build up of sediment, while best management practices and WQMPs prevent pesticides, nutrients, and other pollutants from impairing the state's waters.



A TMDL for Atrazine in the Aquilla Reservoir is one of many projects considered a TSSWCB success story. Atrazine, a possible human carcinogen, is a pre-emergent primarily used to eradicate broadleaf and grassy weeds in corn and sorghum. Since it went on the market in 1958 it has become the most widely used herbicide in the U.S. Although classified as a restricted use product due to its potential for groundwater contamination, Atrazine is commonly found in home and garden products, making it not only an agricultural issue, but an urban issue as well.

In 1998, the Aquilla Reservoir was listed as impaired for Atrazine on the Texas section 303(d) list. The TSSWCB and TCEQ prepared a TMDL and corresponding implementation plan, which were approved by EPA. Working in cooperation with an assortment of federal, state, and local stakeholders, TSSWCB encouraged the implementation of BMPs to reduce sediment and pesticide runoff from corn and sorghum fields. These efforts, and others, resulted in a 60 percent reduction of Atrazine in the Aquilla Reservoir, to levels lower than those required for treated drinking water.

With its many successes, TSSWCB understands the challenge of ensuring agricultural lands maintain their capability to produce food and fiber for future generations, while at the same time protecting water quality. Because of changes in land use, ownership, technology, and population growth, there continues to be a critical need for TSSWCB soil and water conservation programs. Texas has a finite number of productive acres, which places increased demands on agricultural lands. More than ever, farmers and ranchers face complex decisions regarding land use and land management. The TSSWCB believes this handbook can serve as a tool to help landowners make informed decisions regarding the protection of land and water resources.

References:

Environmental Protection Agency (EPA). 2003. Section 319 Nonpoint Source Success Stories. <http://www.epa.gov/owow/nps/Success319/TX.html>.

Libby, Lawrence W. 2001. Policy Issues and Options at the Rural-Urban Interface: A National Perspective. *Southern Perspectives* 5:1, pp. 12-15.





Water Quality Best Management Practices



Clean water does not happen by itself and it is the Texas State Soil and Water Conservation Board's (TSSWCB) intent to offer as much support as possible to make sure that Texas waters stay beautiful and healthy for years to come.





Chapter 1 Animal Feeding Operations



Chapter 1: Animal Feeding Operations

Dairy Essential Practices

- Nutrient Management
- Waste Utilization

Poultry Essential Practices

- Nutrient Management
- Waste Utilization
- Animal Mortality Facility
- Composting Facility
- Waste Storage Facility





Dairy Essential Practices



Nutrient Management

Definition:

This practice involves managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and ground-water pollution.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- To supply plant nutrients for the optimum forage and crop yields

- Provide nutrients to quickly obtain and maintain adequate vegetation for conservation cover, critical areas, grassed waterways, vegetative buffers, or wildlife habitat
- Minimize entry of nutrients to surface and ground water
- To maintain or improve chemical and biological conditions of the soil

Where Practice Applies:

- On land where plant nutrients are applied



Waste Utilization



Definition:

Applying agricultural waste or other waste on the land in an environmentally acceptable manner while maintaining or improving the natural resources.

Benefits of Practice:

- Protect water quality
- Provide fertility for crop, forage, fiber production and forest products
- Improve or maintain soil structure

Where Practice Applies:

- Where agricultural wastes including animal manure and contaminated water from livestock and poultry operations; and agricultural processing residues are generated, and/or utilized



Poultry Essential Practices





Definition:

This practice involves managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and groundwater pollution.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- To supply plant nutrients for the optimum forage and crop yields

- Provide nutrients to quickly obtain and maintain adequate vegetation for conservation cover, critical areas, grassed waterways, vegetative buffers, or wildlife habitat
- Minimize entry of nutrients to surface and groundwater
- To maintain or improve chemical and biological conditions of the soil

Where Practice Applies:

- On land where plant nutrients are applied

Nutrient Management





Waste Utilization

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Benefits of Practice:

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- Improve or maintain soil structure

Where Practice Applies:

- Where agricultural wastes including animal manure and contaminated water from livestock and poultry operations; and agricultural processing residues are generated, and/or utilized





Animal Mortality Facility

Definition:

An on-farm facility for treatment or disposal of livestock and poultry carcasses.

Benefits of Practice:

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Decrease non-point source pollution of surface and groundwater resources
- Reduce the impact of odors that result from improperly handled

animal mortality

- Decrease the likelihood of the spread of disease or other pathogens that result from the interaction of animal mortality and predators
- To provide contingencies for normal and catastrophic mortality events

Where Practice Applies:

- Where animal carcass treatment or disposal must be considered as a component of a waste management system for livestock or poultry operations
- In areas where on-farm carcass treatment and disposal are permitted by federal, state, and local laws, rules, and regulations



Freezer



Incinerator



Composting Facility

Definition:

A composting facility is installed for biological stabilization of waste organic material.

Benefits of Practice:

- To reduce the pollution potential of organic agricultural wastes to surface and groundwater

Where Practice Applies:

- Organic waste material is generated by agricultural production or processing
- A composting facility is a component of a planned agricultural waste management system
- A composting facility can be constructed, operated, and maintained without polluting air and/or water resources



Waste Storage Facility

Definition:

A waste storage facility is a waste impoundment made by constructing an embankment, excavating a pit or dug-out, or by fabricating a structure.

Benefits of Practice:

- To temporarily store wastes such as manure, wastewater, and contaminated runoff as a storage function component of an agricultural waste management system

Where Practice Applies:

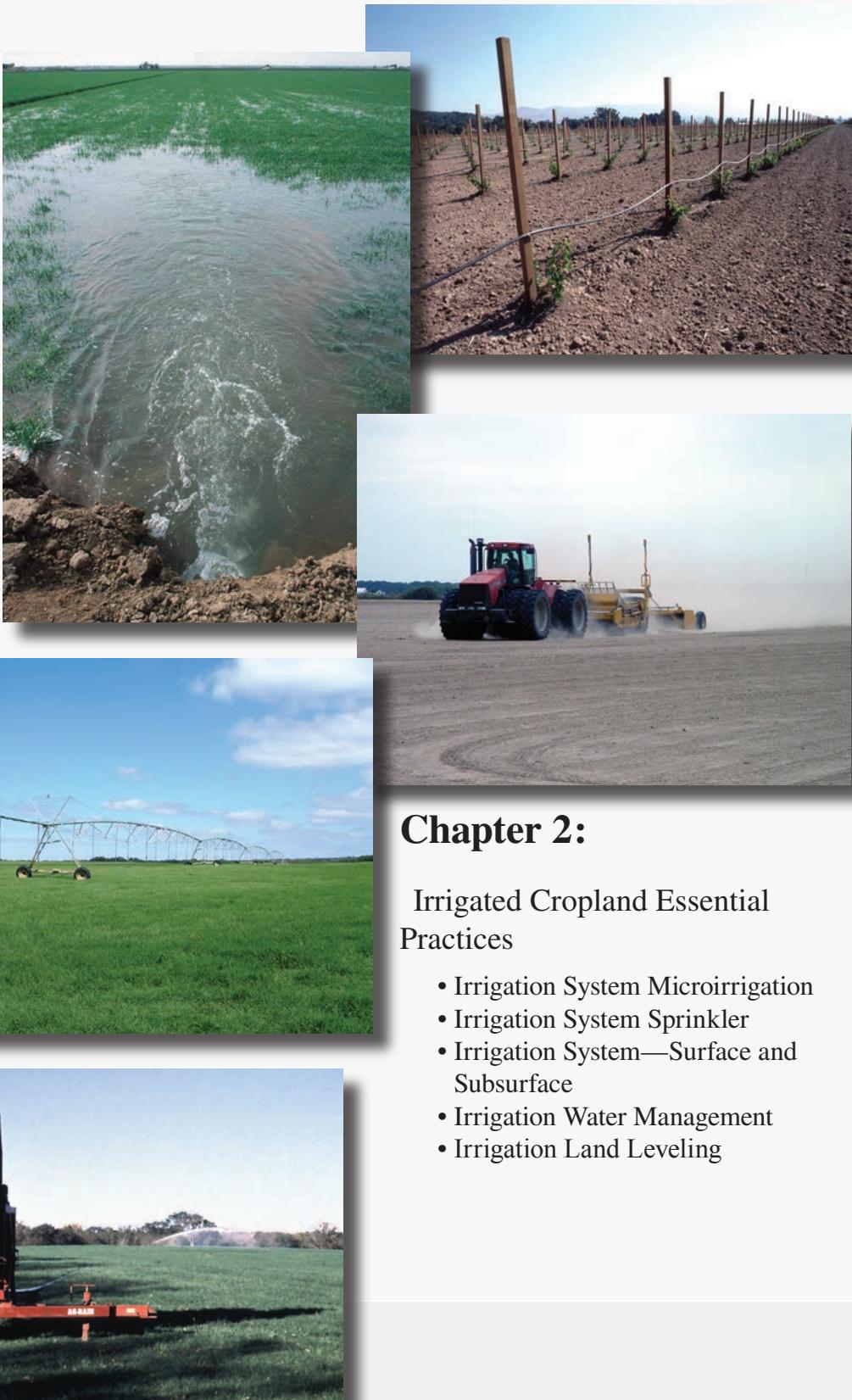
- Where the storage facility is a component of a planned agricultural waste management system
- Where temporary storage is needed for organic wastes generated by agricultural production or processing
- Where the storage facility can be constructed, operated, and maintained without polluting air or water resources





Chapter 2

Irrigated Cropland Essential Practices



Chapter 2:

Irrigated Cropland Essential Practices

- Irrigation System Microirrigation
- Irrigation System Sprinkler
- Irrigation System—Surface and Subsurface
- Irrigation Water Management
- Irrigation Land Leveling





Definition:

A trickle system is a planned system in which all necessary components have been installed for efficient application of irrigation water directly to the root zone of the plants by means of emitters, orifices, or porous tubing.

Benefits of Practice:

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- To efficiently and uniformly apply irrigation water and maintain soil moisture for optimum plant growth
- To apply chemicals

Where Practice Applies:

- On sites where the soils and topography are suitable for irrigation, proposed plants, and where a microirrigation system has been determined to be the most desirable method of irrigation
- To orchard and row crops, windbreaks, greenhouse crops, and residential and commercial landscape systems
- On steep slopes where other methods would cause excessive erosion or on areas where other application devices interfere with cultural operations

Irrigation System Microirrigation





Irrigation System Sprinkler

Definition:

An irrigation system in which all necessary equipment and facilities are installed for efficiently applying water by means of nozzles operated under pressure.

Benefits of Practice:

This practice may be applied as part of a conservation management system to achieve one or more of the following:

- Efficiently and uniformly apply irrigation water to maintain adequate soil moisture for optimum plant growth without causing excessive water loss, erosion, or water quality impairment
- For climate control and/or modification

- Apply chemicals, nutrients, and/or wastewater
- Reduction in particulate matter emissions to improve air quality

Where Practice Applies:

- Suited to most crops, irrigable lands, and climate conditions where irrigated agriculture is feasible. Areas must be suitable for irrigation with water of suitable quality for the purpose intended
- To the planning and design of sprinkler systems for irrigation water and/or wastewater application, chemical application, climate control and/or modification, and particular matter emission control





Irrigation System—Surface and Subsurface

Definition:

A system in which all necessary water-control structures have been installed for the efficient distribution of water by surface means, such as furrows, borders, contour levees, or contour ditches, or by subsurface means.

Benefits of Practice:

This practice is applied as part of a conservation management system to achieve one or more of the following:

- Efficiently convey and distribute irrigation water to the surface point of application without causing excessive water loss, erosion, or water quality impairment
- Efficiently convey and distribute

irrigation water to the subsurface point of application without causing excessive water loss or water quality impairment

- Apply chemicals and/or nutrients as part of an irrigation system

Where Practice Applies:

- To the planning and design of an irrigation water distribution system or a chemical and/or nutrient application system
- Areas must be suitable for irrigation with water of suitable quality for the purpose intended
- Water supplies must be sufficient in quantity and quality to make irrigation practical for the crops to be grown and the application methods to be used





Definition:

Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.

Benefits of Practice:

Irrigation water management is applied as part of a conservation management system to support one or more of the following:

- Manage soil moisture to promote desired crop response
- Optimize use of available water supplies

- Minimize irrigation induced soil erosion
- Decrease non-point source pollution of surface and groundwater resources
- Manage salts in the crop root zone
- Manage air, soil, or plant micro-climate

Where Practice Applies:

- To all irrigated lands
- Where site conditions (soil, slope, crop grown, climate, water quantity and quality, etc) must be available and capable of applying water to meet the intended purpose(s)

Irrigation Water Management





Irrigation Land Leveling

Definition:

Reshaping the surface of land to be irrigated to planned grades.

Benefits of Practice:

- To permit uniform and efficient application of irrigation water to the leveled land

Where Practice Applies:

- To leveling irrigated land based on a detailed engineering survey, design, and layout



Chapter 3 Dry Land Cropland Essential Practices



Chapter 3:

Dry Land Cropland Essential Practices

- Conservation Crop Rotation
- Residue Management
- Nutrient Management
- Pest Management

Other Practices

- Contour Buffer Strips
- Field Borders
- Grassed Waterways
- Filter Strips
- Terraces





Conservation Crop Rotation

Definition:

This practice means growing various crops on the same piece of land in a planned sequence. This sequence may involve growing high residue producing crops such as corn or wheat in rotation with low residue crops such as vegetables or soybeans. The rotation may also involve growing forage crops in rotation with various field crops.

Benefits of Practice:

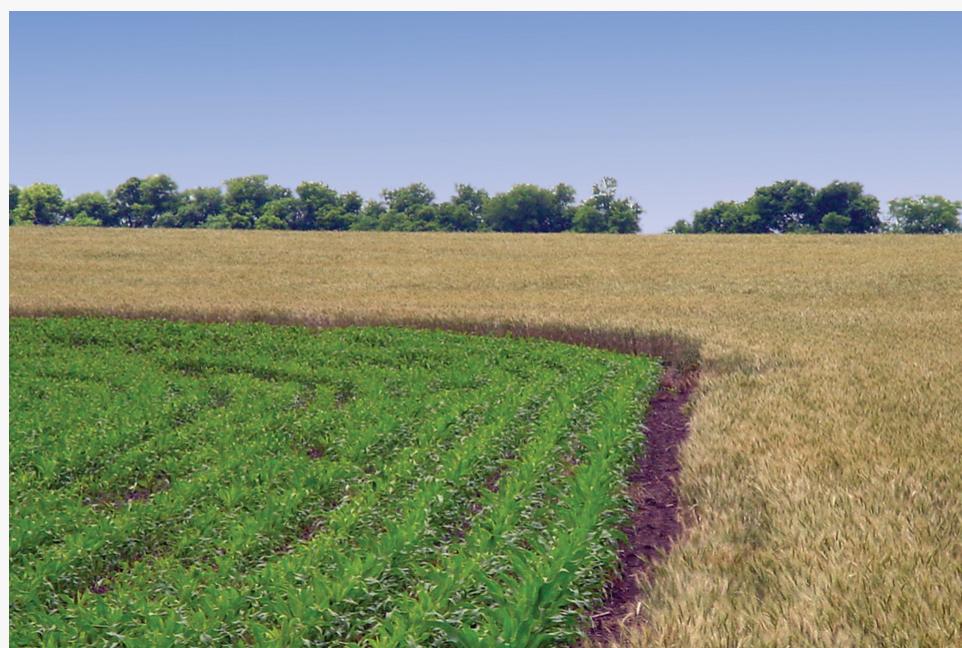
This practice may be applied as part of a conservation management system to support one or more of the following:

- Reduce sheet and rill erosion
- Reduce soil erosion from wind

- Maintain or improve soil organic matter content, soil tilth, and soil condition
- Manage the balance of plant nutrients
- Improve water use efficiency
- Manage plant pests (weeds, insects, and diseases)
- Provide food for domestic livestock
- Provide food and cover for wildlife

Where Practice Applies:

- To all land where crops are grown





Definition:

This practice is managing to leave protective amounts of crop residue on the soils surface during a prescribed time of the year, by delaying primary tillage or seedbed preparation until immediately prior to planting time.

Benefits of Practice:

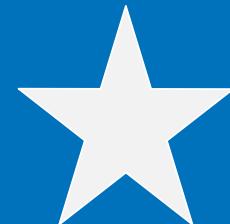
- Reduce sheet and rill erosion
- Reduce soil erosion from wind
- Reduce off-site transport of sediment, nutrients, or pesticides
- Manage snow to increase plant available moisture
- Provide food and escape cover for wildlife

Where Practice Applies:

- To all cropland and other land where crops are grown
- When seasonal residue management is used—seasonal residue management includes managing residues of annual crops from harvest until the residue is:
 - buried by tillage for seed-bed preparation
 - removed by grazing, or
 - mechanically removed
- In the management of residues from biennial or perennial seed crops from the time of seed harvest until regrowth begins next season

Residue Management





Nutrient Management

Definition:

This practice involves managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and groundwater pollution.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- To supply plant nutrients for the optimum forage and crop yields
- Provide nutrients to quickly obtain

and maintain adequate vegetation for conservation cover, critical areas, grassed waterways, vegetative buffers, or wildlife habitat

- Minimize entry of nutrients to surface and groundwater
- To maintain or improve chemical and biological conditions of the soil

Where Practice Applies:

- On land where plant nutrients are applied



Pest Management

Definition:

Managing weeds, insects, and diseases to reduce adverse effects on plant growth, crop production, and natural resources.

- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans

Benefits of Practice:

This practice is applied as part of a Resource Management System (RMS) to support one or more of the following purposes:

- Enhance quantity and quality of commodities

Where Practice Applies:

- Wherever pests will be managed





Field Borders

Definition:

A strip of permanent vegetation established at the edge or around the perimeter of a field.

Benefits of Practice:

- Reduce erosion from wind and water
- Soil and water quality protection
- Management of harmful insect populations
- Provide wildlife food and cover
- Provide linkage to other buffer

practices, square irregular and odd areas, and protect equipment travel areas

Where Practice Applies:

- At the edges of cropland fields
- To connect other buffer practices within the field
- To recreation land or other land uses where agronomic crops are grown



Grassed Waterways



Definition:

A natural or constructed channel that is shaped or graded to required dimensions and established with suitable vegetation.

Benefits of Practice:

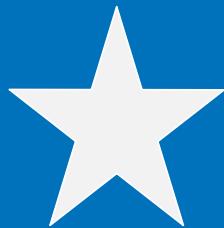
This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- To convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding

- To reduce gully erosion
- To protect/improve water quality

Where Practice Applies:

- In areas where added water conveyance capacity and vegetative protection are needed to control erosion resulting from concentrated runoff, and where such control can be achieved by using this practice alone or in combination with other conservation practices



Filter Strips



Definition:

A filter strip is an area of vegetation established for the purpose of removing sediment, organic material, and other pollutants from runoff and wastewater.

Benefits of Practice:

- To reduce sediment, particulate organics, and sediment absorbed contaminant loading in runoff
- To reduce dissolved contaminant loading in runoff
- To reduce sediment, particulate organics, and sediment absorbed contaminant loading in surface irrigation tailwater
- To reduce pathogen loading in runoff

- To reduce dissolved contaminant and particular loading from an animal feeding operation (AFO) feedlot
- For treatment of runoff as part of an animal waste management system
- To restore, create, or enhance herbaceous habitat for wildlife and beneficial insects
- To maintain or enhance watershed functions and values

Where Practice Applies:

- In areas situated below crop-land, grazing land, or distributed land (including forest land)
- Where sediment, particulate organic matter and/or dissolved contaminants may leave these areas and are entering environmentally sensitive areas
- In areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects, or maintain or enhance watershed function



Definition:

An earth embankment, a channel, or a combination ridge and channel constructed across the slope.

Benefits of Practice:

- Reduce slope length
- Reduce erosion
- Reduce sediment content in runoff water
- Improve water quality
- Intercept and conduct surface runoff at a nonerosive velocity to a stable outlet
- Retain runoff for moisture conservation
- Prevent gully development

- Reform the land surface
- Improve farmability
- Reduce flooding

Where Practice Applies:

- In areas where water erosion is a problem and there is a need to conserve water
- The soils and topography are such that terraces can be constructed and farmed with reasonable effort
- A suitable outlet can be provided
- Runoff and sediment can damage land and/or impair water quality

Terraces

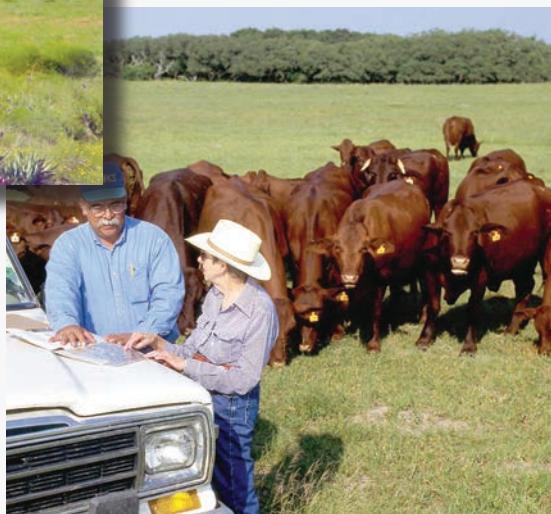






Chapter 4

Pasture and Hayland Essential Practices



Chapter 4:

Pasture and Hayland Essential Practices

- Prescribed Grazing
- Forage Harvest Management
- Nutrient Management
- Pest Management





Prescribed Grazing



Definition:

Managing the controlled harvest of vegetation with grazing animals.

Benefits of Practice:

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Improve or maintain the health and vigor of plant communities
- Improve or maintain quantity and quality of forage for livestock health and productivity
- Improve or maintain water quality and quantity

- Reduce accelerated soil erosion, and maintain or improve soil condition
- Improve or maintain the quantity and quality of food and/or cover available for wildlife
- Promote economic stability through grazing land sustainability

Where Practice Applies:

- To all lands where grazing animals are managed



Forage Harvest Management

Definition:

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage.

Benefits of Practice:

- Optimize the economic yield of forage at the desired quality and quantity
- Promote vigorous plant regrowth
- Maintain stand life for the desired time period
- Maintain desired species composition of the stand

- Use forage plant biomass as a nutrient uptake tool
- Control insects, diseases, and weeds
- Maintain and/or improve wildlife habitat

Where Practice Applies:

- To all land uses where machine harvested forage crops are grown



Definition:

This practice involves managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and groundwater pollution.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- To supply plant nutrients for the optimum forage and crop yields

- Provide nutrients to quickly obtain and maintain adequate vegetation for conservation cover, critical areas, grassed waterways, vegetative buffers, or wildlife habitat
- Minimize entry of nutrients to surface and groundwater
- To maintain or improve chemical and biological conditions of the soil

Where Practice Applies:

- On land where plant nutrients are applied

Nutrient Management





Pest Management

Definition:

Managing weeds, insects, and diseases to reduce adverse effects on plant growth, crop production, and natural resources.

Where Practice Applies:

- Wherever pests will be managed

Benefits of Practice:

This practice is applied as part of a Resource Management System (RMS) to support one or more of the following purposes:

- Enhance quantity and quality of commodities
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans







Chapter 5 Other On-Farm Conservation Practices



Other On-Farm Conservation Practices

- Pasture and Hayland Planting
- Brush Management
- Pond
- Fence
- Range Planting
- Watering Facility
- Deep Tillage
- Critical Planting Area
- Grade Stabilization Structure





Pasture and Hayland Planting



Definition:

Establishing native or introduced forage species.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- Establish adapted and compatible species, varieties, or cultivars
- Improve or maintain livestock nutrition and/or health

- Balance forage demand during periods of low forage production
- Reduce soil erosion and improve water quality

Where Practice Applies:

- On crop, hay, pasture, and other agricultural lands where forage production is feasible and desired



Definition:

Removal, reduction, or manipulation of non-herbaceous plants.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- Restore natural plant community balance
- Create the desired plant community
- Reduce competition for space, moisture, and sunlight between desired and unwanted plants
- Manage noxious woody plants
- Restore desired vegetative cover to protect soils, control erosion, reduce

sediment, improve water quality, and enhance stream flow

- Maintain or enhance wildlife habitat including that associated with threatened and endangered species
- Improve forage accessibility, quality, and quantity for livestock
- Protect life and property from wildfire hazards
- Improve visibility and access for handling livestock

Where Practice Applies:

- On rangeland, native or naturalized pasture, and pasture and haylands where removal or reduction of excessive woody (non-herbaceous) plants is desired

Brush Management





Definition:

A water impoundment made by constructing a dam, an embankment, or by excavating a pit or dugout.



Benefits of Practice:

- To provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard spraying, and other related uses, and to maintain or improve water quality

Where Practice Applies:

- Site conditions shall be such that runoff from the design storm can be safely passed through (1) a natural or constructed auxillary spillway, (2) a combination of a prinicipal spillway and an auxil-lary spillway, or (3) a principal spillway.



Pond





Fence

Definition:

A constructed barrier to livestock, wildlife, or people.

Benefits of Practice:

- May be applied as part of a conservation management system to facilitate the application of conservation practices that treat the soil, water, air, plant, animal, and human resource concern

Where Practice Applies:

- On any area where livestock and/or wildlife control is needed
- Where access to people is to be regulated

Note: Fences are not needed where natural barriers will serve the purpose.





Range Planting

Definition:

Establishing adapted plants by seeding on native grazing land (does not include pasture and hayland planting).

Benefits of Practice:

- Prevent excessive soil and water loss and improve water quality
- Produce more forage for livestock
- Improve the visual quality of rangeland

- Provide or improve forage, browse, or cover for wildlife
- Restore historic plant communities

Where Practice Applies:

- On land where the planned use is rangeland, native pasture, grazable forest, and grazed wildlife land





Watering Facility

Definition:

A device (tank, trough, or other watertight container) for providing animal access to water.

Benefits of Practice:

To provide watering facilities for livestock and/or wildlife at selected locations in order to:

- Protect and enhance vegetative cover through proper distribution of grazing

- Provide erosion control through better grassland management; or
- Protect streams, ponds and water supplies from contamination by providing alternative access to water

Where Practice Applies:

- To all land uses where there is a need for new or improved watering facilities





Definition:

Performing tillage operations below the normal tillage depth to modify the physical or chemical properties of soil.

Benefits of Practice:

This practice may be applied as part of a resource management system to accomplish one or more of the following purposes:

- Fracture restrictive soil layers
- Bury or mix soil deposits from wind or water erosion or flood overwash
- Reduce concentration of soil contaminants, which inhibit plant growth

Where Practice Applies:

- To land having adverse soil conditions which inhibit plant growth, such as compacted layers formed by field operations, restrictive layers such as claypans, overwash or deposits from wind and water erosion or flooding, or contaminants in the root zone
- To tillage operations commonly referred to as deep plowing, subsoiling, ripping, or row-till, performed from time to time below the normal tillage depth



Deep Tillage





Critical Area Planting

Definition:

Establishing permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

Benefits of Practice:

- Stabilize areas with existing or expected high rates of soil erosion by water
- Stabilize areas with existing or expected high rates of soil erosion by wind

- Restore degraded sites that cannot be stabilized through normal methods

Where Practice Applies:

- On areas with existing or expected high rates of erosion or degraded sites that usually cannot be stabilized by ordinary conservation treatment and/or management, and if left untreated, could be severely damaged by erosion or sedimentation or could cause significant off-site damage



Before



After



Grade Stabilization Structure



Definition:

A structure used to control the grade and head cutting in natural or artificial channels.

Benefits of Practice:

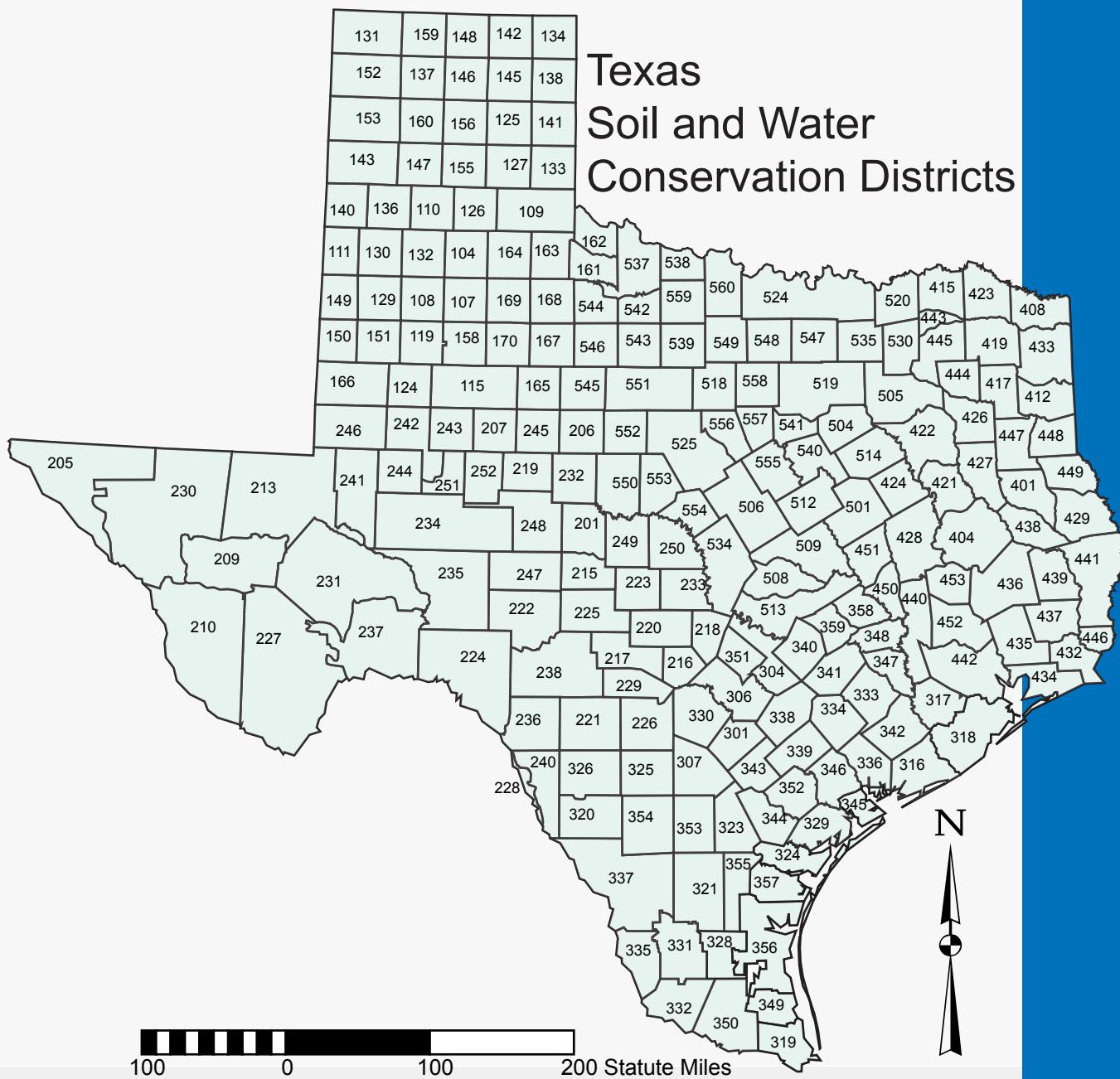
- To stabilize the grade and control erosion in natural or artificial channels
- To prevent the formation or advance of gullies
- To enhance environmental quality and reduce pollution hazards

Where Practice Applies:

- In areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion

Appendix I

Texas Soil and Water Conservation Districts



TEXAS SOIL WATER CONSERVATION DISTRICTS BY COUNTY - AS OF JULY 14, 2004

COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Anderson	421	ANDERSON-HOUSTON	305 East Lacy St., Suite 100	Palestine	75801	(903) 729-7174	(903) 729-7005	andersonhoustonswcd@tx.nacdnet.org
Andrews	246	ANDREWS	P. O. Box 611	Andrews	79714	(432) 523-4760	(432) 524-9513	andrewsswcd@tx.nacdnet.org
Angelina	438	UPPER NECHES	1520 East Denman #101	Lufkin	75501	(936) 639-8661	(936) 639-8677	uppernechesswcd@tx.nacdnet.org
Aransas, Refugio	329	COPANO BAY	603 East Empresario	Refugio	78377	(361) 526-2531	(361) 526-4530	copanobayswcd@tx.nacdnet.org
Aransas, San Patricio	324	SAN PATRICIO	1150 E. Market, Suite B	Sinton	78387	(361) 364-1371	(361) 364-5568	sampatricioswcd@tx.nacdnet.org
Archer	559	ARCHER COUNTY	P. O. Box 548	Archer City	76351	(940) 574-4612	(940) 574-4169	archercountyswcd@tx.nacdnet.org
Armstrong	155	STAKED PLAINS	P. O. Box 229	Claude	79019	(806) 226-3951	(806) 226-5002	stakedplainsswcd@tx.nacdnet.org
Atascosa	307	ATASCOSA COUNTY	107 Wyoming Blvd	Pleasanton	78064-4401	(830) 569-2232	(830) 569-6275	atascosacountyswcd@tx.nacdnet.org
Austin	347	AUSTIN COUNTY	520 South Front	Bellville	77418	(979) 865-3139	(979) 865-3625	austincountyswcd@tx.nacdnet.org
Bailey	111	BLACKWATER VALLEY	105 East Ave D	Muleshoe	79347	(806) 272-5124	(806) 272-3809	blackwatervalleyswcd@tx.nacdnet.org
Bandera	229	BANDERA	2836 SH 16 North	Bandera	78003	(830) 796-3334	(830) 796-8121	banderaswcd@tx.nacdnet.org
Bastrop	340	BASTROP COUNTY	507 Old Austin Hwy	Bastrop	78602	(512) 321-2489	(512) 321-14177	bastropcountyswcd@tx.nacdnet.org
Baylor	542	MILLER-BRAZOS	400 East Ingram, Suite B	Seymour	76380	(940) 889-2810	(940) 889-2154	millerbrazosswcd@tx.nacdnet.org
Bee	344	BEE	1400 W Corpus Christi, Box 8	Beeville	78102	(361) 358-1178	(361) 358-0701	beeswcd@tx.nacdnet.org
Bell, Milam	509	CENTRAL TEXAS	P. O. Box 1832	Temple	76503	(254) 939-7808	(254) 933-1904	centraltexasswcd@tx.nacdnet.org
Bell, Milam, Williamson	508	LITTLE RIVER-SAN GABRIEL	P. O. Box Q	Bartlett	76511	(254) 527-3271	(254) 527-4338	littleversangsabrielswcd@tx.nacdnet.org
Bexar	330	ALAMO	107 Wyoming Blvd.	Pleasanton	78664	(210) 472-5527	(210) 472-5525	alamoswcd@tx.nacdnet.org
Blanco	218	PEDERNALES	P. O. Box 156	Johnson City	78636	(830) 868-7237	(830) 868-9296	pedernalesswcd@tx.nacdnet.org
Bosque	555	BOSQUE	9523 State Hwy 6	Meridian	76665	(254) 435-2355	(254) 435-2046	bosqueswcd@tx.nacdnet.org
Bowie	408	BOWIE COUNTY	905-D Hwy 82W	New Boston	75670	(903) 628-6509	(903) 628-4287	bowiecountyswcd@tx.nacdnet.org
Brazoria, Galveston	318	WATERS DAVIS	209 East Mulberry, Suite 300	Angleton	77515	(979) 849-6820	(979) 849-7190	watersdavisswcd@tx.nacdnet.org
Brazos	450	BRAZOS COUNTY	3823 South Texas Avenue, #112	Bryan	77802	(719) 246-1016	(719) 268-8106	brazoscountyswcd@tx.nacdnet.org
Brewster, Jeff Davis, Pecos, Terrell	227	BIG BEND	Box 1397	Alpine	79331	(432) 837-5864	(432) 837-9120	bigbendswcd@tx.nacdnet.org
Briscoe	126	CAP ROCK	P. O. Box 660	Silverton	79257	(806) 823-2431	(806) 823-2563	caprockswcd@tx.nacdnet.org
Brooks	328	LOMA BLANCA	P. O. Box 327	Falfurrias	78355	(361) 325-2236	(361) 325-5340	lomablancaswcd@tx.nacdnet.org
Brown	553	PECAN BAYOU	P. O. Box 562	Brownwood	76804	(325) 643-1587	(325) 646-8630	pecanbayouswcd@tx.nacdnet.org
Burleson	358	BURLESON COUNTY	1800 West State Hwy 21	Caldwell	77836	(979) 567-6715	(979) 567-6715	burlesoncountyswcd@tx.nacdnet.org
Burnet, Lampasas	534	HILL COUNTRY	P. O. Box 1148	Burnet	78611	(512) 756-4651	(512) 756-1921	hillcountryswcd@tx.nacdnet.org
Caldwell	304	CALDWELL-TRAVIS	1400-D Hwy 20 East	Lockhart	78644	(512) 398-2121	(512) 398-5043	caldwelltravisswcd@tx.nacdnet.org
Calhoun	345	CALHOUN	P. O. Box 553	Port Lavaca	77979-0553	(361) 552-2969	(361) 552-4235	calhounswcd@tx.nacdnet.org
Callahan, Shackelford, Stephens	552	CALLAHAN DIVIDE	141 West 4th, Suite B	Baird	79504	(325) 854-1349	(325) 854-1643	callahandivideswcd@tx.nacdnet.org
Cameron	319	SOUTHMOST	2315 West Expressway 83 Rm 10	San Benito	78586	(956) 399-2522	(956) 399-0033	southmostswcd@tx.nacdnet.org
Carson	156	MCCLELLAN CREEK	P. O. Box 26	Panhandle	79068	(806) 537-3504	(806) 537-3255	mcclellancreekswcd@tx.nacdnet.org



COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Castro	136	RUNNING WATER	P. O. Box 38	Dimmitt	79027	(806) 647-2153	(806) 647-4734	runningwaterswcd@tx.nacdnet.org
Chambers	434	TRINITY BAY	P. O. Box 1366	Anahuac	77541-1366	(409) 267-3581	(409) 267-4139	trinitybayswcd@tx.nacdnet.org
Cherokee	427	CHEROKEE COUNTY	Route 5 Box 4940	Rusk	75785	(903) 683-4669	(903) 683-2183	cherokeecountyswcd@tx.nacdnet.org
Childress, Hall	109	HALL-CHILDRESS	1002 West Noel	Memphis	79245	(940) 937-8301	(940) 937-6533	halchildressswcd@tx.nacdnet.org
Clay	560	LITTLE WICHITA	210 West Ikard Street	Henrietta	76365	(940) 538-4681	(940) 538-5750	littlewichitawcd@tx.nacdnet.org
Cochran	149	COCHRAN	P. O. Box 905	Morton	79346	(806) 266-5061	(806) 266-5632	cochranswcd@tx.nacdnet.org
Coke	219	COKE COUNTY	P. O. Box 50	Robert Lee	76845	(325) 453-2623	(325) 453-4686	cokercountywcd@tx.nacdnet.org
Coleman	550	CENTRAL COLORADO	119 West Street	Coleman	76834	(325) 625-4197	(325) 625-2290	centralcoloradoswcd@tx.nacdnet.org
Collin	535	COLLIN COUNTY	1406-D N McDonald Street	McKinney	75071	(972) 542-0081	(972) 542-4001	collincountywcd@tx.nacdnet.org
Collingsworth	133	SALT FORK	802 Ninth St.	Wellington	79095	(806) 447-2575	(806) 447-5345	saltforkswcd@tx.nacdnet.org
Colorado	333	COLORADO	316 Spring Street, Room 108	Columbus	78934	(979) 732-9565	(979) 732-9565	coloradoswcd@tx.nacdnet.org
Comal, Guadalupe	306	COMAL-GUADALUPE	P. O. Box 982	Seguin	78156	(830) 379-0930	(830) 401-0176	comalgualupeswcd@tx.nacdnet.org
Comanche, Eastland	525	UPPER LEON	301 Hwy 3381	Comanche	76442	(325) 356-5186	(325) 356-7566	upperleonswcd@tx.nacdnet.org
Concho	201	CONCHO	P. O. Box 392	Eden	76637	(325) 369-5051	(325) 369-5741	conchoswcd@tx.nacdnet.org
Cooke, Grayson, Montague	524	UPPER ELM-RED HAMILTON-CORYELL	2200 North Grand Avenue P. O. Box 31	Gainesville Hamilton	76240 76631	(940) 668-7794 (254) 865-5000	(940) 665-9503 (254) 865-8546	upperelmswcd@tx.nacdnet.org hamiltoncoryellswcd@tx.nacdnet.org
Coryell, Hamilton	506	HAMILTON-CORYELL	P. O. Box 31					
Cottle	163	COTTELL	Box 539	Paducah	79248	(806) 492-3537	(806) 492-3128	cottleswcd@tx.nacdnet.org
Crockett	235	CROCKETT	P. O. Box 1048	Ozona	76943	(325) 392-2301	(325) 392-4146	crockettswcd@tx.nacdnet.org
Crosby	107	RIO BLANCO	402 South Ayshire	Crosbyton	79322	(806) 675-2303	(806) 675-8045	rioblancoswcd@tx.nacdnet.org
Dallam	131	DALLAM	622 West 7th Street	Dalhart	79022-3304	(806) 244-2782	(806) 244-3830	dallamswcd@tx.nacdnet.org
Dallas, Tarrant	519	DALWORTH	320 Westway Place, Suite #311	Arlington	76018	(817) 467-3867	(817) 467-9729	dalworthswcd@tx.nacdnet.org
Dawson	124	DAWSON COUNTY	P. O. Box 155	Lamesa	79331	(806) 372-6504	(806) 372-3789	dawsoncountyswcd@tx.nacdnet.org
De Witt	339	DEWITT COUNTY	1119 N. Esplanade	Cuero	77954	(361) 275-5293	(361) 275-8477	dewittcountyswcd@tx.nacdnet.org
Deaf Smith	143	TIERRA BLANCA	315 West Third Street	Hereford	79045	(806) 364-0530	(806) 364-7949	tierrablancaaswcd@tx.nacdnet.org
Denton	547	DENTON COUNTY	525 South Loop 288 #C-1	Denton	76205	(940) 566-3311	(940) 383-2047	dentoncountyswcd@tx.nacdnet.org
Dickens	169	DUCK CREEK	312 Willard Ave.	Spur	79370	(806) 271-3307	(806) 271-3282	duckcreekswcd@tx.nacdnet.org
Dimmit, Zavala	320	DIMMIT COUNTY	200 South 1st St., Suite A	Carizo Springs	78844	(830) 876-2312	(830) 876-5108	dimmitswcd@tx.nacdnet.org
Donley	127	DONLEY COUNTY	P. O. Box 829	Clarendon	79226	(806) 874-3561	(806) 874-3832	donleycountyswcd@tx.nacdnet.org
Duval	321	AGUA POQUITAS	P. O. Box 477	Benavides	78341	(361) 256-3342	(361) 539-4146	aguapoquitaswcd@tx.nacdnet.org
Ector, Crane	241	SANDHILLS	2464 West I-20	Odessa	79763	(432) 332-9541	(432) 332-2943	sandhillsswcd@tx.nacdnet.org
Edwards, Real	238	UPPER NUICES-FRIO	P. O. Box 214	Rocksprings	78880	(830) 683-2125	(830) 683-4187	uppernuicesfrioswcd@tx.nacdnet.org
Edwards, Sutton	222	EDWARDS PLATEAU	301 South Crockett	Sonora	76950	(325) 387-3237	(325) 387-9236	edwardsplateauswcd@tx.nacdnet.org
El Paso, Hudspeth	205	EL PASO-HUDSPETH	11930 Vista Del Sol, Suite B	El Paso	79936	(915) 855-0884	(915) 857-3647	elpasohudspethswcd@tx.nacdnet.org
Ellis	504	ELLIS-PRARIE	1822 FM 66, Suite 102	Waxahachie	75167	(972) 937-2660	(972) 933-1702	ellisprairie@swcd@tx.nacdnet.org



COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Erath	556	CROSS TIMBERS	239 East McNeill	Stephenville	76401	(254) 965-3715	(254) 965-2492	crosstimbersswcd@tx.nacdnet.org
Falls, Limestone	501	LIMESTONE-FALLS	1213 East Yeaqua Street	Groesbeck	76642	(254) 729-2310	(254) 729-3459	limestonefallsswcd@tx.nacdnet.org
Fannin, Grayson	520	FANNIN COUNTY	P. O. Box 426	Bonham	75418	(903) 583-5612	(903) 583-7993	fannincountyswcd@tx.nacdnet.org
Fayette	341	FAYETTE	P. O. Box 417	La Grange	78945	(979) 968-5458	(979) 968-5270	fayetteswcd@tx.nacdnet.org
Fisher	165	UPPER CLEAR FORK	P. O. Box 279	Roby	79543-0279	(325) 776-2284	(325) 776-9029	upperclearforkswcd@tx.nacdnet.org
Floyd	104	FLOYD COUNTY	P. O. Box 157	Floydada	79235	(806) 983-2352	(806) 983-6333	floydcountyswcd@tx.nacdnet.org
Foard	161	FOARD COUNTY	Box 180	Crowell	79227	(940) 684-1977	(940) 684-1380	foardcountyswcd@tx.nacdnet.org
Fort Bend	317	COASTAL PLAINS	1402 Band Road, Suite 200	Rosenberg	77471	(281) 232-6898	(281) 232-5868	coastalplainsswcd@tx.nacdnet.org
Franklin, Titus, Morris, Camp	419	SULPHUR-CYPRESS	1809 W. Ferguson, Suite D	Mt. Pleasant	75455-2954	(903) 572-5411	(903) 577-8983	sulphurcypressswcd@tx.nacdnet.org
Freestone	424	FREESTONE COUNTY	P. O. Box 1014	Fairfield	75840-0019	(903) 389-2154	(903) 389-2904	freestonountyswcd@tx.nacdnet.org
Frio	325	FRIO	P. O. Box 180	Pearall	78061	(830) 334-4112	(830) 334-8367	frioswcd@tx.nacdnet.org
Gaines	166	GAINES COUNTY	Box 394	Seminole	79360	(432) 758-3722	(432) 758-6656	gainescountyswcd@tx.nacdnet.org
Garza	158	GARZA	210 West Main	Post	79356	(806) 495-2056	(806) 495-3642	garzawcd@tx.nacdnet.org
Gillespie	220	GILLESPIE COUNTY	1906 North Llano, Suite #105	Fredericksburg	78624	(830) 997-3349	(830) 990-4338	gillespiecountyswcd@tx.nacdnet.org
Glasscock	251	GLASSCOCK COUNTY	P. O. Box 315	Garden City	79739	(432) 397-2401	(432) 397-2401	glasscockcountyswcd@tx.nacdnet.org
Glasscock, Martin	242	MUSTANG	Box 1070	Stanton	79782	(432) 756-3421	(432) 756-2269	mustangswcd@tx.nacdnet.org
Glasscock, Sterling	252	NORTH CONCHO RIVER	Box 994	Sterling City	76951	(325) 378-3971	(325) 378-2216	northconchoriverswcd@tx.nacdnet.org
Goliad	352	GOLIAD COUNTY	P. O. Box 453	Goliad	77963	(830) 583-3224	(830) 583-9497	goliadcountyswcd@tx.nacdnet.org
Gonzales	338	GONZALES COUNTY	920 St. Joseph Street, Rm 142	Gonzales	78629	(830) 672-8371	(830) 672-2577	gonzalescountyswcd@tx.nacdnet.org
Gray	125	GRAY COUNTY	12125 East Frederic, Suite B	Pampa	79065	(806) 665-1751	(806) 665-7796	graycountyswcd@tx.nacdnet.org
Grimes, Waller	440	NAVASOTA	519 Ninth Street	Hempstead	77445	(936) 825-3790	(936) 825-3790	navasotaswcd@tx.nacdnet.org
Hale	132	HALE COUNTY	304 South Garland	Plainview	79072-9500	(806) 293-1349	(806) 293-8788	halecountyswcd@tx.nacdnet.org
Hansford	148	HANSFORD	909 West 9th	Spearman	79081	(806) 659-2330	(806) 659-2590	hansfordswcd@tx.nacdnet.org
Hardeman	162	LOWER PEASE RIVER	P. O. Box 338	Quanah	79252	(940) 663-5421	(940) 663-6912	lowerpeaseriverswcd@tx.nacdnet.org
Hardin	437	LOWER NECHES	P. O. Box 488	Kountze	77625	(409) 246-3404	(409) 246-2415	lowernecheswcd@tx.nacdnet.org
Harris	442	HARRIS COUNTY	10808 Huffmeister	Houston	77065	(281) 469-7856	(281) 469-7005	harriscountyswcd@tx.nacdnet.org
Harrison	412	HARRISON COUNTY	701-A South Washington	Marshall	75670	(903) 935-3491	(903) 938-4375	harrisoncountyswcd@tx.nacdnet.org
Hartley	152	HARTLEY	P. O. Box 15	Hartley	79044	(806) 365-4454	(806) 365-4713	hartleyswcd@tx.nacdnet.org
Haskell	546	HASKELL	607 North 1st St East, Suite B	Haskell	79521	(940) 864-8516	(940) 864-3095	haskellswcd@tx.nacdnet.org
Hays	351	HAYS COUNTY	501 Broadway, Suite B	San Marcos	78666	(512) 392-4050	(512) 392-5623	hayscountyswcd@tx.nacdnet.org
Hemphill	138	HEMPHILL	814 South 2nd #B	Canadian	79014	(806) 323-6752	(806) 323-5026	hemphillswcd@tx.nacdnet.org
Henderson	422	TRINITY-NECHES	P. O. Box 2734	Athens	75751	(903) 675-3259	(903) 677-3429	trinitynecheswcd@tx.nacdnet.org
Hidalgo	350	HIDALGO	2514 South I Road, Suite #2	Edinburg	78539	(956) 383-3002	(956) 383-6088	hidalgoswcd@tx.nacdnet.org
Hill	540	HILL COUNTY-BLACKLAND	P. O. Box 756	Hillsboro	76645	(254) 582-3436	(254) 582-3284	hillcountyblacklandswcd@tx.nacdnet.org
Hockley	129	HOCKLEY COUNTY	920 Austin Street	Levelland	79336	(806) 894-3273	(806) 894-8590	hockleycountyswcd@tx.nacdnet.org

COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Hood, Somervell	557	BRAZOS VALLEY	305 Western Hills Trail 530 Hillcrest #2	Granbury	76049 (817) 573-1666	(817) 579-7410 (903) 885-2933		brazosvalleyswcd@tx.nacdnet.org hopkinsstrainsswcd@tx.nacdnet.org
Hopkins	445	HOPKINS-RAINS		Sulphur Springs	75482	(903) 885-0455		howardswcd@tx.nacdnet.org
Howard	243	HOWARD	302 West Hwy I-20, Suite 101	Big Spring	79720	(432) 287-1871		upperabinesswcd@tx.nacdnet.org
Hunt	530	UPPER SABINE	2206 Traders Road, Suite 200	Greenville	75402	(903) 455-6212		hutchinsonswcd@tx.nacdnet.org
Hutchinson	146	HUTCHINSON	P. O. Box 3421	Stinnett	79083	(806) 878-2241		lipscombswcd@tx.nacdnet.org
Jack	549	JACK	246 South Main	Jacksboro	76458-2320	(940) 567-5641		lackswcd@tx.nacdnet.org
Jackson	336	JACKSON	700 N Wells St, Rm #200	Edna	77957	(361) 732-7151		jacksonswcd@tx.nacdnet.org
Jasper, Newton	441	JASPER-NEWTON	P. O. Box 1354	Jasper	75651	(409) 384-3332		jaspernewtonswcd@tx.nacdnet.org
Jeff Davis, Hudspeth, Culberson	230	HIGH POINT	P. O. Box 545	Van Horn	79855	(432) 283-2277		highpointswcd@tx.nacdnet.org
Jeff Davis, Presidio	210	HIGHLAND	P. O. Box 185	Marfa	79843	(432) 729-4532		highlandswcd@tx.nacdnet.org
Jim Hogg	331	MONTE MUUCHO	1700 North Smith, Suite B	Hebronville	78361	(361) 527-3253		montemuchoswcd@tx.nacdnet.org
Jim Wells	355	JIM WELLS COUNTY	2287 North Texas Blvd #5	Alice	78332-3120	(361) 668-8361		jimwellscountyswcd@tx.nacdnet.org
Johnson	541	JOHNSON COUNTY	103-B Poindexter Ave.	Cleburne	76033-4406	(817) 645-7711		johnsontownswcd@tx.nacdnet.org
Jones	545	CALIFORNIA CREEK	1003 23rd Street	Anson	79501	(325) 823-3371		californiacreekswcd@tx.nacdnet.org
Karnes	343	KARNES COUNTY	491 N Sunset Strip, Suite #103	Kenedy	78119-2044	(830) 583-3224		karnescountyswcd@tx.nacdnet.org
Kaufman, Rockwall, Van Zandt	505	KAUFMAN-VAN ZANDT	8620 FM 741	Forney	75126	(972) 552-5254		kaufmanvanzandtswcd@tx.nacdnet.org
Kendall	216	KENDALL	430 West Banderas Suite #16	Boerne	78006	(830) 249-2821		kendallswcd@tx.nacdnet.org
Kenedy, Kleberg	356	KLEBERG-KENEDY	920 East Caesar, Suite 4	Kingsville	78363-3365	(361) 592-0309		klebergkenedyswcd@tx.nacdnet.org
Kenedy, Willacy	349	WILLACY	255 FM Rd 3168 Suite 2	Raymondville	78580	(956) 639-2542		willacyswcd@tx.nacdnet.org
Kent	170	ANDREW KENT	P. O. Box 106	Jayton	79528	(806) 237-2624		andrewkentswcd@tx.nacdnet.org
Kerr	217	KERR COUNTY	420 Water St, Suite 101	Kerrville	78028	(830) 896-4911		kerrcountyswcd@tx.nacdnet.org
Kimble	225	UPPER LLANOS	522 Main Street	Junction	766349	(325) 446-2722		upperlanosswcd@tx.nacdnet.org
King	168	KING	Box 45	Guthrie	79236	(806) 596-4658		kingswcd@tx.nacdnet.org
Kinney	236	WEST NUECES-LAS MORAS	Box 188	Brackettville	78832	(830) 563-2414		westnueceslasmorasswcd@tx.nacdnet.org
Knox	544	WICHITA-BRAZOS	1101 East Main Street	Knox City	79529	(940) 658-3526		wichitabrazosswcd@tx.nacdnet.org
La Salle	354	LASALLE COUNTY	506 North Main, Suite A	Cotulla	78014	(830) 879-2621		lasallecountyswcd@tx.nacdnet.org
Lamar	415	LAMAR	1745-B, Ballard Drive	Paris	75460	(903) 794-6679		lamarswcd@tx.nacdnet.org
Lamar, Delta	443	DELTA	1400 West Wilson	Cooper	75432	(903) 395-4517		deltaswcd@tx.nacdnet.org
Lamb	130	LAMB COUNTY	2431 South Farwell Avenue	Littlefield	79339	(806) 395-4044		lambcountyswcd@tx.nacdnet.org
Lavaca	334	LAVACA	310 South LaGrange Street	Hallettsville	77964	(361) 798-3277		lavacaswcd@tx.nacdnet.org
Lee	359	LEE COUNTY	791 West Austin Street	Giddings	78842	(979) 542-5014		leeountyswcd@tx.nacdnet.org
Leon, Madison, Grimes	428	BEDIAS CREEK	120 S Elm, #110 Trim-Elm Bldg	Madisonville	77864	(936) 348-2666		bediascreetswcd@tx.nacdnet.org
Liberty	435	LOWER TRINITY	P. O. Box 406	Liberty	77575	(936) 336-9145		lowertrinityswcd@tx.nacdnet.org
Lipscomb	134	LIPSCOMB	Box 97	Follett	79034	(806) 633-2561		lipscombswcd@tx.nacdnet.org
Live Oak, McMullen	323	LIVE OAK	P. O. Box 555	George West	78022	(361) 449-2242		liveoakswcd@tx.nacdnet.org

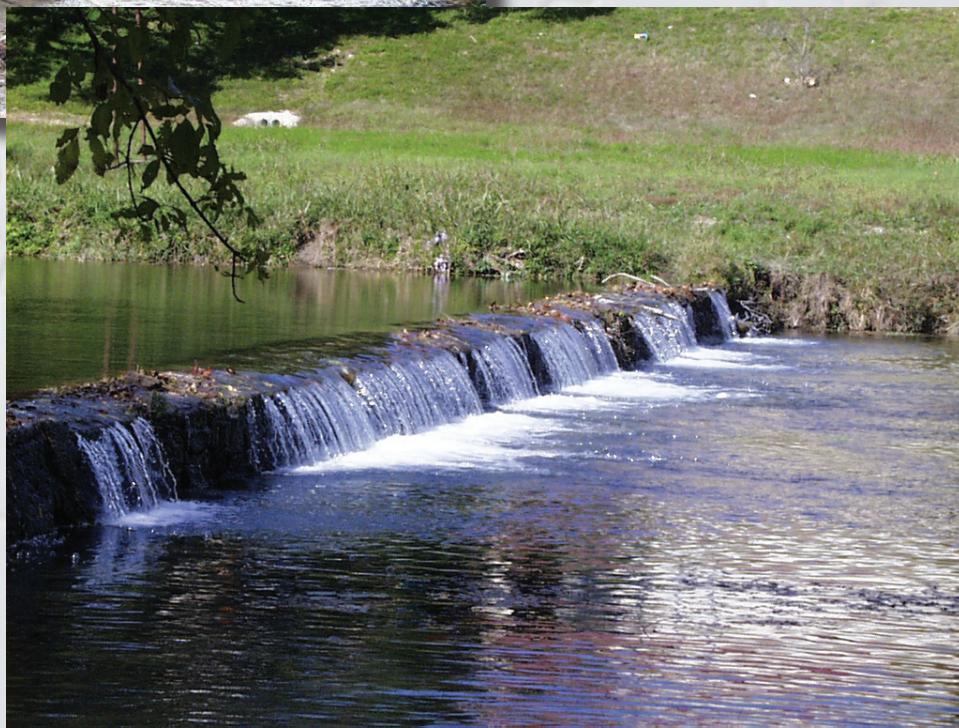
COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Llano	233	LLANO COUNTY	1447 E. State Hwy 71, Unit E-3	Llano	78643-3534	(325) 247-5154	(325) 247-4954	llanocountyswcd@tx.nacdnet.org
Lubbock	108	LUBBOCK COUNTY	6113 -43rd Street, Suite A	Lubbock	79407	(806) 785-5644	(806) 785-5973	lubbockcountyswcd@tx.nacdnet.org
Lynn	119	LYNN COUNTY	P. O. Box 328	Tahoka	79373	(806) 998-4507	(806) 998-5346	lynccountyswcd@tx.nacdnet.org
Marion, Cass	433	MARION-CASS	207 Hwy 8N	Linden	75563	(903) 756-5491	(903) 756-7791	mariocassswcd@tx.nacdnet.org
Mason	223	MASON COUNTY	Box 388	Mason	76856	(325) 347-5749	(325) 347-5844	masoncountyswcd@tx.nacdnet.org
Matagorda	316	MATAGORDA COUNTY	2200 Ave A.	Bay City	77414	(979) 245-1138	(979) 244-2362	matagordacountyswcd@tx.nacdnet.org
Maverick	228	MAVERICK	2210 Loop 431, Suite #130	Eagle Pass	78852	(830) 773-2518	(830) 773-8302	maverickswcd@tx.nacdnet.org
Maverick	240	CHAPARAL	2210 Loop 431, Suite #130	Eagle Pass	78852	(830) 773-2518	(830) 773-8302	chaparalswcd@tx.nacdnet.org
McCulloch	249	MCCULLOCH	200-A East 11th St	Brady	76825	(325) 597-1860	(325) 597-0132	mccullochswcd@tx.nacdnet.org
McLennan	512	MCLENNAN COUNTY	5040 South Loop 340	Waco	76706	(254) 662-3623	(254) 662-4203	mclennancountyswcd@tx.nacdnet.org
McMullen	353	MCMULLEN COUNTY	Box 98	Tilden	78072	(361) 274-3221	(361) 274-3226	mcmullencountyswcd@tx.nacdnet.org
Medina	226	MEDINA VALLEY	P. O. Box 399	Hondo	78861	(830) 426-2521	(830) 426-2175	medinavalleyswcd@tx.nacdnet.org
Menard	215	MENARD COUNTY	P. O. Box 665	Menard	76859	(325) 396-4708	(325) 396-2762	menardswcd@tx.nacdnet.org
Midland	244	MIDLAND	1307 East Wadley	Midland	79705	(432) 684-6827	(432) 685-3396	midlandswcd@tx.nacdnet.org
Mills	554	MILLS COUNTY	P. O. Box 695	Goldthwaite	76844	(325) 648-3118	(325) 648-2734	millscountyswcd@tx.nacdnet.org
Mitchell	207	MITCHELL	P. O. Box 910	Colorado City	79512	(325) 728-3473	(325) 728-2960	mitchellsbcd@tx.nacdnet.org
Montgomery	452	MONTGOMERY COUNTY	109 Commercial Circle, #110	Conroe	77304	(936) 756-4135	(936) 756-4196	montgomerycountyswcd@tx.nacdnet.org
Moore	137	MOORE COUNTY	801 South Bliss, Suite 104	Dumas	79029	(806) 935-4401	(806) 935-7920	moorecountyswcd@tx.nacdnet.org
Motley	164	UPPER PEASE	Box 550	Matador	79244	(806) 347-2263	(806) 347-2241	upperpeaseswcd@tx.nacdnet.org
Nacogdoches	401	NACOGDOCHES	4609 Northwest Stallings	Nacogdoches	75962	(936) 564-5891	(936) 560-2428	nacogdochesswcd@tx.nacdnet.org
Navarro	514	NAVARRO	4323 West Hwy 22	Corsicana	75110	(903) 874-5131	(903) 872-1130	navarroswcd@tx.nacdnet.org
Nolan	245	NOLAN COUNTY	103 West Florida Ave.	Sweetwater	79556	(325) 235-4485	(325) 236-6129	nolancountyswcd@tx.nacdnet.org
Nueces	357	NUECES	548 South Hwy 77, Suite B	Robstown	78380-2438	(361) 387-4116	(361) 767-1051	nuecesswcd@tx.nacdnet.org
Ochiltree	142	OCHILTREE	800 North Main	Perryton	79070	(806) 435-6597	(806) 435-4914	ochiltreeswcd@tx.nacdnet.org
Oldham	153	OLDHAM COUNTY	P. O. Box 566	Vega	79092	(806) 267-2429	(806) 267-2916	oldhamcountyswcd@tx.nacdnet.org
Orange, Jefferson	432	COASTAL	8330 College Street, Suite B	Beaumont	77707	(409) 860-5081	(409) 860-4968	coastalswcd@tx.nacdnet.org
Orange, Jefferson	446	LOWER SABINE-NECHEES	16300 Hwy 62 South	Orange	77630	(409) 745-2723	(409) 745-2722	lowerSabineNecheeswcd@tx.nacdnet.org
Palo Pinto	518	PALO PINTO	204 Southeast 3rd Avenue	Mineral Wells	76067	(940) 325-3961	(940) 325-1103	palointoswcd@tx.nacdnet.org
Panola	448	PANOLA	P. O. Box 184	Carthage	75633	(903) 693-3424	(903) 694-2432	panolaswcd@tx.nacdnet.org
Parker	558	PARKER COUNTY	604 North Main, Suite 100	Weatherford	76086	(817) 594-4672	(817) 599-6109	parkercountyswcd@tx.nacdnet.org
Parmer	140	PARMER	P. O. Box 359	Farwell	79325	(806) 481-3311	(806) 481-3512	parmerswcd@tx.nacdnet.org
Pecos, Brewster, Terrell	237	RIO GRANDE-PECOS RIVER	P. O. Box 427	Sanderson	79848	(432) 345-2595	(432) 345-2246	riograndepecosriverrswd@tx.nacdnet.org
Pecos, Terrell	231	TRANS PECOS	2306 West Dickinson Blvd., #3	Fort Stockton	79735	(432) 336-5206	(432) 336-9620	transpecosswcd@tx.nacdnet.org
Polk, San Jacinto	436	POLK-SAN JACINTO	P. O. Box 841	Livingston	77351	(936) 327-4434	(936) 327-5968	polksanjacintoswcd@tx.nacdnet.org
Potter	160	CANADIAN RIVER	6565 Amarillo Blvd W Suite B	Amarillo	79106-1725	(806) 468-8600	(806) 468-7114	canadianriverswcd@tx.nacdnet.org

COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Rains, Wood	444	WOOD	P. O. Box 1416 2315 11th Avenue	Quitman	75783	(903) 763-2348	(903) 763-5671	woodswcd@tx.nacdnet.org
Randall	147	PALO DURO	P. O. Box 490	Canyon	79015	(806) 655-2578	(806) 655-8463	paloduroswcd@tx.nacdnet.org
Reagan, Irion, Upton	234	MIDDLE CONCHO	900 East Main St.	Big Lake	76932	(325) 884-2182	(325) 884-7023	middleconchoswcd@tx.nacdnet.org
Red River	423	RED RIVER COUNTY	P. O. Box 206	Clarksville	75426	(903) 427-2288	(903) 427-5360	redrivercountyswcd@tx.nacdnet.org
Reeves, Jeff Davis, Culberson, Pecos Reeves, Loving, Ward, Winkler	209	TOYAH-LIMPIA	P. O. Box 1027 Box 37	Balmorhea	79718	(432) 375-2277	(432) 375-2382	toyahlimpiaswcd@tx.nacdnet.org
Roberts	145	ROBERTS	1305 West FM 1644	Pecos	79772	(432) 445-3196	(432) 445-7723	upperpecos@tx.nacdnet.org
Robertson	451	ROBERTSON COUNTY	Box 387	Miami	79059	(806) 888-3531	(806) 888-6911	robertsswcd@tx.nacdnet.org
Runnels	232	RUNNELS	1305 South Main, Suite 102	Franklin	77856	(979) 828-3626	(979) 828-3108	robertsoncountyswcd@tx.nacdnet.org
Rusk	447	RUSK	101 South Bolivar Street	Ballinger	76821	(325) 365-3415	(325) 365-5920	russwcd@tx.nacdnet.org
Sabine, San Augustine, San Saba	429	PINEY WOODS	1606 E. Wallace, Suite 2	Henderson	75654	(903) 657-8221	(903) 657-2571	ruskswcd@tx.nacdnet.org
Schleicher	250	SAN SABA	P. O. Box 459	San Augustine	75972	(936) 275-2374	(936) 275-2594	pineywoodsswcd@tx.nacdnet.org
Scurry, Borden, Shackelford, Stephens, Callahan	115	ELDORADO-DIVIDE	5309 Big Spring Hwy	San Saba	76877	(325) 372-5638	(325) 372-6060	sansabaswcd@tx.nacdnet.org
Shelby	551	UPPER COLORADO	584 US Hwy 180 East	Eldorado	76936	(325) 853-3535	(803) 853-2824	eldoradodivideswcd@tx.nacdnet.org
Sherman	449	SHELBY	158 Cass Caid Drive	Albany	76430	(325) 762-2277	(325) 762-2352	lowerclearforkbrazzoswcd@tx.nacdnet.org
Smith	159	SHERMAN COUNTY	P. O. Box 389	Center	75935	(936) 538-5557	(936) 538-8957	shelbyswcd@tx.nacdnet.org
Starr	426	SMITH COUNTY	Route 16, 4209 Republic Drive	Stratford	79084	(806) 396-5517	(806) 396-2162	shermancountyswcd@tx.nacdnet.org
Stonewall	332	STARR COUNTY	208 S. Norris Street	Tyler	75701	(903) 581-1318	(903) 534-9353	smithcountyswcd@tx.nacdnet.org
Taylor	167	STONEWALL	Drawer E	Rio Grande City	78882	(956) 487-5598	(956) 487-2414	starrcountyswcd@tx.nacdnet.org
Terry	206	MIDDLE CLEAR FORK	1982 B Lytle Way	Aspermont	79502	(940) 989-2627	(940) 989-3753	stonewallswcd@tx.nacdnet.org
Throckmorton	151	TERRY	217 West Hill Street	Abilene	79602	(325) 672-1781	(325) 672-9148	middleclearforkswcd@tx.nacdnet.org
Tom Green	543	THROCKMORTON	P. O. Box 400	Brownfield	79316	(806) 637-8092	(806) 637-2705	terryswcd@tx.nacdnet.org
Travis, Williamson	248	TOM GREEN	3514 Devonian, Suite C	Throckmorton	76483	(940) 849-5331	(940) 849-3235	throckmortonswcd@tx.nacdnet.org
Trinity, Houston	513	TAYLOR	813 West 2nd Street	San Angelo	76903	(325) 655-3521	(325) 658-5466	tomgreenswcd@tx.nacdnet.org
Uvalde	404	DAVY CROCKETT-TRINITY	1032 South 4th Street	Taylor	76574	(512) 352-3441	(512) 352-3382	taylorswcd@tx.nacdnet.org
Val Verde	110	TULE CREEK	P. O. Box 415	Crockett	75635	(936) 544-3759	(936) 544-4095	davycrockettrinityswcd@tx.nacdnet.org
Tyler	439	LONG LEAF	407 North Pine Street	Tula	79088	(806) 995-1054	(806) 995-2131	tulecreekswcd@tx.nacdnet.org
Upshur, Gregg	417	UPSHUR-GREGG	1259 Hwy 271 South	Woodville	75979	(936) 283-5409	(936) 283-5409	longleafswcd@tx.nacdnet.org
Victoria	221	NUECES-FRIO-SABINAL	P. O. Box 270	Gillmer	75645	(903) 734-8732	(903) 734-1443	upshurgreggswcd@tx.nacdnet.org
Walker	224	DEVIL'S RIVER	P. O. Box 1071	Uvalde	78802-0270	(830) 278-2014	(830) 278-3603	nuecfrisosabinalswcd@tx.nacdnet.org
Washington	348	WASHINGTON	312 S Main St. Fed Bldg Rm 308	Del Rio	78841	(830) 775-3813	(830) 775-1859	devilsrivervswcd@tx.nacdnet.org
			2 Financial Plaza, #735	Victoria	77901	(361) 575-1129	(361) 575-9537	victoriaswcd@tx.nacdnet.org
			P. O. Box 1252	Huntsville	77340	(936) 291-1901	(936) 291-3058	walkercountyswcd@tx.nacdnet.org
				Brenham	77834	(979) 850-7123	(979) 850-1392	washingtonswcd@tx.nacdnet.org



COUNTY	SWCD #	DISTRICT NAME	ADDRESS	CITY	ZIP	PHONE	FAX	EMAIL
Webb	337	WEBB	7209 East Saunders, Suite 7 2225 Hwy 59 South	Laredo	78043	(956) 723-6643	(956) 723-3508	webbswcd@tx.nacdnet.org
Wharton	342	WHARTON COUNTY	P. O. Box 1233	Wharton	77488	(979) 532-0567	(979) 282-2456	whartontoncountyswcd@tx.nacdnet.org
Wheeler	141	WHEELER COUNTY	402 North Wall Street	Wheeler	79096	(806) 826-3565	(806) 826-5873	wheelercountyswcd@tx.nacdnet.org
Wichita	538	WICHITA	5015 College Drive, Room #3	Iowa Park	76367	(940) 592-4147	(940) 592-9944	wichtaswcd@tx.nacdnet.org
Wilbarger	537	WILBARGER	1106 Tenth Street	Vernon	76384	(940) 553-4393	(940) 553-4516	willbargerswcd@tx.nacdnet.org
Wilson	301	WILSON COUNTY	1604 W. Business 380, Suite B	Floresville	78114	(830) 393-3555	(830) 393-4253	wilsoncountyswcd@tx.nacdnet.org
Wise	548	WISE	P. O. Box 420	Decatur	76234	(940) 627-2942	(940) 627-5098	wiseswcd@tx.nacdnet.org
Yoakum	150	YOAKUM	1591 380 By-Pass	Plains	79355	(806) 456-3703	(806) 456-2048	yoakumswcd@tx.nacdnet.org
Young	539	YOUNG	1825 STOP 18B	Graham	76450	(940) 549-0422	(940) 549-0133	youngswcd@tx.nacdnet.org
Zapata	335	ZAPATA	P. O. Box 536	Zapata	78076-2801	(956) 765-4344	(956) 765-5383	zapataswcd@tx.nacdnet.org
Zavala	326	WINTER GARDEN	Crystal City	78839	(830) 876-2115	(830) 876-5108		wintergardenswcd@tx.nacdnet.org





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