

DISTRICT MISSION

The Wes-Tex Groundwater Conservation District is committed to providing for the conservation, protection, the enhancement of recharge, and the prevention of waste of groundwater within the District by developing and implementing an efficient, economical and environmentally sound conservation program with full consideration and respect for the individual citizens of the District.

TIME PERIOD FOR THIS PLAN

This plan becomes effective upon the adoption by the Board of Directors of the Wes-Tex Groundwater Conservation District and certification by the Texas Water Development Board. This plan remains in effect for ten years from the date of certification by the Texas Water Development Board, or until a revised plan is certified, whichever is earlier.

STATEMENT OF GUIDING PRINCIPLES

The citizens of Nolan County recognize the vital importance of groundwater to the economy and longevity of the county. Groundwater being the predominate water resource; the district recognizes the need to conserve and protect the quantity and the quality of groundwater through prudent and cost effective management. The goals of this plan can be best achieved through guidance from locally elected board members who have an understanding of local conditions as well as technical support from knowledgeable agencies. Management planning should be based upon an awareness of the hydrogeologic properties of the specific aquifers within the District as well as quantification of existing and future resource data. This management plan is intended only as a reference tool to provide guidance in the execution of district activities, but should allow flexibility in achieving its goals.

GENERAL DESCRIPTION

The District was created by the citizens of Nolan County through election in November, 2002. The current officers are John Adams, Jr., chairman; Archie Hunter, vice-chairman; Randall Bankhead, Secretary-Treasurer. Other Board members include Lance Hall, Alton Pyburn, Randy Petty, Thomas Saunders, Henry Ortega, and Jeff Howard. Directors are elected from Nolan County Commissioner's precincts, with a member from an incorporated area and an unincorporated area within each of the four precincts. Additionally, one director is elected as an at-large position from the entire county. The Wes-Tex Groundwater Conservation District has the same real extent as that of Nolan County, Texas. The county has a diverse economy, with energy, agriculture and industry all represented. Livestock operations include cattle, sheep, goats, and hogs. Crops

include cotton, sorghum, wheat, hay, pecans, and some fruits and vegetables. One of the major industries is United States Gypsum, which began operations in Nolan County in 1924. Wind energy has recently become a major economic force in the county, with several large wind fields constructed since 2000. Oil and gas production have been a part of Nolan County for several decades. Lone Star Industries has been a major economic force since 1950. Texas State Technical College in Sweetwater is a vocational training facility that opened in 1970. Communities in the county include Sweetwater, Roscoe, Blackwell, Maryneal, and Nolan-Divide. The largest tourist attraction is the Sweetwater Rattlesnake Roundup held in March of each year.

LOCATION AND EXTENT

The Wes-Tex Groundwater Conservation District shares a boundary with Nolan County. Nolan County is in west central Texas, bounded on the east by Taylor County, on the south by Coke and Runnels counties, on the west by Mitchell County, and on the north by Fisher County. The center of the county lies at 32°18' north latitude and 100°24' west longitude. Sweetwater, the county seat and largest population center, is forty-two miles west of Abilene, 125 miles southeast of Lubbock, and 130 miles northeast of Odessa. The county was named for Philip Nolan. It lies on the lower plains, with the western end of the Callahan Divide in the southern section of the county. The loamy soils of the county are light to dark, with deep, clayey or loamy subsoils and lime accumulations. The county has very little timber; hackberry, scrubby post oak, cottonwood, and mesquite trees grow along the streams, and Rocky Mountain junipers or scrub cedars grow on the hillsides. Annual rainfall averages 22.19 inches, and the growing season averages 221 days. Temperatures range from an average minimum of 30° F in January to an average maximum of 96° F in July. The agricultural economy centers around cattle and livestock products, but 50 percent of the annual agricultural income is from crops, especially cotton, wheat, sorghum, and hay. Petroleum, natural gas, gypsum, rock, and sand and gravel are also produced in the county. *

*Taken from "NOLAN COUNTY." Handbook of Texas Online. <<http://www.tsha.utexas.edu/handbook/online/view/NN/hcn4.html>> [Accessed Tue Aug 17 9:43 US/Central 2004.] by *Gerald McDaniel*

TOPOGRAPHY AND DRAINAGE

The land is predominantly rolling uplands to the north, with plateaus traversed by valleys in the south; altitudes range from 2,000 to 2,700 feet above sea level. Streams in the northern part of the county, including Cottonwood, Bitter, Stink, and Sweetwater creeks, drain into the Clear Fork of the Brazos River. In the southern part of the county Silver, Wilson, Fish, and Oak creeks drain into the Colorado River.* USDA Hydrogeologic Units include #4812060102 – Brazos Watershed in the northern half of the county, #481208002 – Upper Colorado and Champion Watershed in the middle western portion of the county, #4812080008 – Oak Creek / Spence Watershed in the southern third of the county, and #4812090101 – Valley Creek Watershed in the extreme southeastern portion of the county. (*Source: USDA Natural Resources Conservation Service, Abilene Field Office*)

*Taken from "NOLAN COUNTY." Handbook of Texas Online. <<http://www.tsha.utexas.edu/handbook/online/view/NN/hcn4.html>> [Accessed Tue Aug 17 9:43 US/Central 2004.] by Gerald McDaniel

GROUNDWATER RESOURCES OF WES-TEX G.C.D.

Only two formations constitute significant aquifers in Nolan County. These are the Antlers Sand of the Cretaceous Edwards Group (also referred to as the Trinity Group), and the Santa Rosa Formation of the Triassic Dockum Group. In many areas of western Nolan County, the Antlers Sand and the Santa Rosa Formation lie beneath the limestones of the Edwards Group. Where the Edwards limestone and the Antlers Sand have been stripped away by erosion, the Dockum Group is either exposed or buried beneath the sand and gravel deposits of the Ogallala Formation (Pliocene). In some areas, the Ogallala also lies above the Antlers Sand. Although a major aquifer in the High Plains of western Texas, the Ogallala Formation in Nolan County lies above the regional water table and provides a pathway for the downward movement of water to recharge the Antlers and the Santa Rosa. Permian rocks lie beneath the Dockum Group, and are present in the subsurface throughout the county. In the northern part of the county, these rocks form extensive outcrops where erosion has removed the younger Cretaceous and Triassic rocks. Permian Rocks are in this area of Texas, however, are not a significant source of water.

The Antlers Sand provides small volumes of stock water for farms and ranches. The yields of many of the wells producing from this formation are less than 20 gallons per minute (gpm), although a few irrigation wells are reported to have yields of greater than 100 gpm. The Brazos G Regional Water Plan estimates an average availability of groundwater from the Antlers Sand (Edwards-Trinity) of 600 acre feet per year in Nolan County.

The Santa Rosa Formation is the only significant source of groundwater. The formation is present in western Nolan County, but disappears toward the east and south because of

erosion preceding the deposition of the Cretaceous formations. The formation probably disappears slightly to the west of Maryneal and east of Roscoe. The aquifer is confined in areas where the Santa Rosa lies beneath the Antlers Sand and the Edwards limestone. Recharge occurs by leakage through the overlying formations. Where the Santa Rosa Formation lies beneath the Ogallala Formation, groundwater occurs under unconfined conditions, and recharge is traceable to leakage from the Ogallala. The Texas Water Development Board estimates there are 569,920 acre feet of groundwater in storage in the Dockum aquifer in Nolan County, with all of that water having less than 5,000 mg/l of total dissolved solids (TDS). This is an estimate of storage only, not recoverable water. The Brazos Region G Water Plan estimates that only 3,280 acre feet are available each year from the Dockum aquifer in Nolan County. The Trinity Edwards and the Dockum aquifers combined have a total availability of 3,880 acre feet of water per year in Nolan County.

In western Nolan County, there is a strong possibility of contamination by herbicides, pesticides and fertilizers. There is also a possibility of contamination by oil field brine.*

* Report on Potential Areas for Groundwater Development in the Vicinity of Sweetwater, Nolan County, Texas: LBG-Guyton Associates, Austin, Texas. February 1997. Used with permission from the City of Sweetwater.

SURFACE WATER RESOURCES OF WES-TEX G.C.D.

Surface water availability in the Wes-Tex GCD is limited small allocations from the Brazos River and the Lake Sweetwater Reservoir. The City of Sweetwater has authorized storage in Lake Sweetwater of 10,000 acre feet, and an authorized diversion of 3,740 acre feet. The priority date on this right is 10/17/27. The Brazos G Regional Water Plan lists a Year 2000 yield for Lake Sweetwater of 1,400 acre feet, but projects a Year 2050 yield of only 467 feet. The prolonged drought of the 1990's has forced the City of Sweetwater to depend upon groundwater withdrawals for municipal use.

With regard to Brazos River Rights, H&H Feedlot in Nolan County has a 45 acre feet per year authorized diversion from the Brazos River, with a 1958 Year of Priority Date. Additionally, there are 90 acre feet per year authorized diversions for irrigation use.

**PROJECTED GROUNDWATER SUPPLIES OF WES-TEX G.C.D.
In Acre-Feet {31 TAC §356(a) (5) (A)}**

<u>Year</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Municipal	1,556	1,556	1,556	1,556	1,556	1,556
Manufacturing	50	50	50	50	50	50
Mining	388	388	388	388	388	388
Irrigation	1,745	1,745	1,745	1,745	1,745	1,745
Livestock	141	141	141	141	141	141
TOTALS	3,880	3,880	3,880	3,880	3,880	3,880

Data taken from Brazos G Regional Water Plan, Table 4-51, 2001

**GROUNDWATER SUPPLIES IN ACRE-FEET
TAKEN FROM TECHNICAL TABLE #4
BRAZOS G REGIONAL WATER PLAN**

<u>Aquifer</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Dockum	3280	3280	3280	3280	3280	3280
Edwards – Trinity	600	600	600	600	600	600

GROUNDWATER USE IN WES-TEX G.C.D.*
{31 TAC §356.5(a)(5)(B)}
Figures Reported in Acre-Feet

	Municipal	Irrigation	Mining	Manufacturing	Livestock	County / Other
1997	438 – Brazos G 438 - TWDB	1,562- Brazos G 1,562 – TWDB	277 - Brazos G 277 - TWDB	36 – Brazos G 36 – TWDB	101 – Brazos G 101 - TWDB	0 – Brazos G 0 - TWDB
1998	488 – TWDB	1,431 – TWDB	277 – TWDB	62 – TWDB	75 – TWDB	0 – TWDB
1999	477 – TWDB	1,604 – TWDB	277 – TWDB	62 – TWDB	55 – TWDB	0 – TWDB
2000	1,004- Brazos G 782 – TWDB	2,591 – USDA 1,745- Brazos G 4,894 – TWDB	388 – Brazos G 277 – TWDB	50 – Brazos G 80 – TWDB	141 – Brazos G	512 – Brazos G 0 – TWDB
2001	2,008 –City of S/W	3,055- Brazos G	277- Brazos G	537 – Brazos G	438 – Brazos G	0 - TWDB
2002	3,310-City of S/W					
2003	3,617-City of S/W					

**The Wes-Tex GCD Board of Directors has elected to include all data available in this historical use table. The purpose is to compare data and identify data gaps and needs so the District may better fulfill its stated mission.*

**Annual Amount of Recharge to the Groundwater
Resources Within the District
{31 TAC §356.5(a)(5)(C)}**

Dockum Aquifer Annual Effective Recharge for Nolan County in Acre-Feet:

Brazos River Basin	680
Colorado River Basin	2,600
Total Effective Annual	3,280

Muller, D.A. and Price, R.D., 1979, Groundwater Availability in Texas, Texas Dept of Water Resources Report 238,77p.

Edwards-Trinity Annual Effective Recharge for Nolan County in Acre-Feet:

Assuming a 2% of annual rainfall average, total recharge is calculated as 11,900 acre-feet per year.

Anaya, Roberto, per telephone call October 19, 2004 citing the 2004 GAM for the Edwards-Trinity (Plateau) Aquifer completed by the Texas Water Development Board. GAM Release date October 18, 2004. (Ridgeway, C. and Anaya, R.)

**How Natural or Artificial Recharge of Groundwater Within
The District Might Be Increased
{31 TAC §356.5(a)(5)(C)}**

Brush Management: The eradication of mesquite (*Prosopis sp.*) and juniper (*Juniperus sp.*) from areas of moderate to heavy brush canopy would yield additional groundwater supplies.

Groundwater Recharge Structures: Structures designed to collect or impound surface water in canyons and streambeds cut into fractured rock may increase the volume of water available for recharge by slowing the amount of surface runoff during flood events.

PROJECTED DEMANDS FOR WATER IN NOLAN COUNTY
In Acre Feet {31 TAC §356.5(a)(5)(D)}

Year	2000	2010	2020	2030	2040	2050
Municipal	4,909	4,869	4,774	4,644	4,484	4,377
Manufacturing	558	619	682	747	815	885
Mining	482	407	390	356	350	354
Irrigation	1,835	1,787	1,740	1,694	1,649	1,606
Livestock	905	905	905	905	905	905
TOTALS	8,689	8,587	8,491	8,346	8,203	8,127

Data taken from Brazos G Regional Water Plan, Table 4-51, 2001

POTENTIAL DEMAND AND SUPPLY

Based on current calculations and projections it is obvious that issues will arise when demands exceed supplies. The District will use all regulatory statutes available to encourage the cities of Sweetwater and Roscoe, and the Water Supply Corporations in the District to develop conservation plans and additional surface water supplies. The District will also encourage additional water supplies through groundwater conservation education programs at the school and community levels.

MANAGEMENT OF GROUNDWATER SUPPLY
{31 TAC §356.5(a)(6)}

The District will manage the supply of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will continue to identify and engage in such activities and practices, that if implemented, would result in the conservation and protection of the groundwater. The observation and monitoring network will continue to be reviewed and maintained in order to monitor changing conditions of groundwater within the District. The District will undertake investigations of the groundwater resources within the District and will make the results of those investigations available to the public.

The District will adopt, as necessary, rules to regulate the groundwater withdrawals by means of spacing and/or production limits. The relevant factors to be considered in making the determination to grant a permit or limit groundwater withdrawal will include:

1. The purpose of the District and its rules;
2. The equitable conservation and preservation of the resource, and;

3. The economic hardship resulting from granting or denying a permit or the terms prescribed by the rules.

In pursuit of the District mission of conserving and protecting the resource, the District will enforce the terms and conditions of permits and rules of the District by enjoining the permit holder in a court of competent jurisdiction, as provided for in TWC §36.102, if necessary.

ACTIONS, PROCEDURES, PERFORMANCES AND AVOIDANCE FOR PLAN IMPLEMENTATION {31 TAC §356.5(a)(4)}

The District will implement the provisions of the plan and will utilize the provisions of the plan as a guidepost for determining the direction or priority for all District Activities. All operations of the District, all agreements entered into by the District, and any additional planning efforts in which the District may participate will be consistent with the provisions of the plan.

The District will adopt, as necessary, rules relating to the implementation of this plan. The rules adopted by the District shall be pursuant to TWC §36 and the provisions of this plan. All rules will be adhered and enforced. The promulgation and enforcement of the rules will be based upon the best technical evidence available.

The District shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic effect or unique local characteristics. In granting discretion to any rule, the Board shall consider the potential for adverse effect on adjacent landowners and aquifer conditions. The exercise of said discretions by the Board shall not be construed as limiting the power of the board.

The methodology that the District will use to trace its progress on an annual basis in achieving its management goals will be as follows:

The District Manager will prepare and present an annual report to the Board of Directors on the District performance in regards to achieving management goals and objectives (during the first monthly Board of Directors meeting each fiscal year, beginning October 1, 2005.) This report will include the number of instances each activity was engaged in during the year.

The annual report will be maintained on file at the District office.

GOALS, MANAGEMENT OBJECTIVES AND PERFORMANCE STANDARDS

GOAL 1.0 – Providing for the most efficient use of groundwater {31 TAC §356.5(a)(1)(A)}

1.1 Management Objective

Each year, on four (4) or more occasions, the District will disseminate educational information relating to conservation practices for the efficient use of water resources. These will include but are not limited to publications from the Texas Water Development Board, the Texas Commission on Environmental Quality, Texas Cooperative Extension Service, the Texas Water Resource Institute, and other resources.

1.1a Performance Standard - Number of occasions, annually, the District disseminated educational information related to conservation practices for the efficient use of groundwater will be reported to in the Annual Report to the Board of Directors.

1.1b Performance Standard – Number of educational literature packets that have been distributed will be reported to the board in the annual report.

1.2 Management Objective

The District will adopt and enforce a set of rules regarding the spacing of all new wells drilled within the District to limit the areas of overlapping cones of depression.

1.2a Performance Standard - The number of wells drilled each year in compliance with the adopted spacing rules will be reported to the Board annually.

1.3 Management Objective

The District will implement a district-wide voluntary monitoring network to evaluate groundwater availability. Wells will be monitored for static level at least quarterly each year.

1.3a Performance Standard – The number of wells involved in the project, and respective static levels, will be reported to the Board of Directors annually. Wells will be placed on a well numbering grid map for reference.

**GOAL 2.0 – Controlling and preventing waste of groundwater
{31 TAC §356(a)(1)(B)}**

2.1 Management Objective – The District will provide an annual report to the Board regarding the number and status of reported wasteful practices and non-beneficial water use in the District. If a wasteful practice is reported to the District, the District will respond in writing within five (5) working days.

2.1a Performance Standard – Any reports of wasteful practices will be summarized in the annual report to the Board of Directors. Summaries shall include all relevant dates, information, and any remedial action taken by the District (if applicable).

2.2 Management Objective – The general manager will disseminate educational information or article concerning beneficial use and the identification of wasteful practices on at least two occasions each year.

2.2a Performance Standard – The number of occasions the District submitted or disseminated information to district citizens shall be reported to the board of directors in the annual report each year.

GOAL 3.0 – Addressing Drought Conditions {31 TAC §356.(a)(1)(F)}

3.1 Management Objective – On a monthly basis, the district will download the updated Palmer Drought Severity Index (PDSI) map and check for the periodic updates to the Drought Preparedness Council Situation Report posted on the Texas Water Information Network website. www.txwin.net.

3.1a Performance Standard – Quarterly, the District will make an assessment of the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps and Situation Reports will be included with copies of the quarterly briefing in the District annual report provided to the Directors.

3.2 Management Objective – The district will adopt a set of rules requiring all entities within the District that are responsible for having Drought Contingency Plans submitted to the Texas Commission on Environmental Quality have a copy of their plan on file with the Wes-Tex GCD.

3.2a Performance Standard – The annual report shall contain a list of all entities that have filed drought contingency plans with the District.

GOAL 4.0 – Addressing Conservation {TAC §356.(a)(1)(G)}

4.1 Management Objective – The district will submit an article regarding water conservation for publication each year to at least one newspaper of general circulation in Nolan County.

4.1a Performance Standard – A copy of the article submitted by the District for publication will be included in the annual report given to the Board of Directors.

4.2 Management Objective – District personnel will be available to present water conservation programs to school, 4-H, scouting, and community groups per request. These programs will be scheduled through the administrative office, and will be appropriate to the audience. The manager will present programs at least twice a year.

4.2a Performance Standard – A summary of programs presented, content, and audience group will be submitted in the annual report. A bibliography of any conservation literature received by the audience will be included with the summary. The number of programs presented will be included in the report.

4.3 Management Objective - The district will adopt a set of rules requiring all entities within the District that are responsible for having Water Conservation Plans submitted to the Texas Commission on Environmental Quality have a copy of their plan on file with the Wes-Tex GCD.

4.3a Performance Standard – The annual report shall contain a list of all entities that have filed Water Conservation Plans with the District, in compliance with the adopted district rule.

GOAL 5.O – Addressing Conjunctive Surface Water Issues {TAC §356.5(a)(1)(D)}

5.1 Management Objective – The district will encourage and provide resources when possible to the cities of Sweetwater and Roscoe toward developing alternative sources of surface water for future use.

5.1a Performance Standard – The district manager will meet with the city water utilities manager annually (once per year) to discuss surface water implementation. Documentation of this meeting will be included in the annual report.

5.2 Management Objective – The District will actively participate in the Regional Planning Process (Region G – Brazos) to remain current with surface water issues.

5.2a Performance Standard – The general manager will attend at least one meeting of the Brazos G RPG annually, and will review the agenda and minutes of each meeting with the GCD representative on the Regional Water Planning Group.

Management Goals Not Applicable to the District

Controlling and Preventing Subsidence: The District has not been advised as to any issues with subsidence that exist within the boundaries of the District.
{31 TAC §356.5(a)(1)(E)}

Natural Resource Issues: The District has not been advised as to any threatened or endangered species that exist within the boundaries of the District that are significantly impacted by groundwater usage. {31 TAC§356(a)(1)(E)}

Action Required for Plan Certification {31 TAC §356.6}

The management plan for the Wes-Tex Groundwater Conservation District was adopted by resolution on November 4th, 2004. The management plan was designed to remain in effect for ten years from the date of certification as administratively complete by the Texas Water Development Board. The current management plan will remain in effect unless the District chooses to adopt an amended plan management plan that is certified by the TWDB. The amended management plan will become effective as of the date of certification by the TWDB. To comply with the requirements of Chapter 36 of the Texas Water Code, the District will review its existing management plan annually and readopt the plan with or without revisions at least every five years.

Appendices

Appendix A – Map of the Aquifers of Nolan County

Appendix B – Certified Copy of District Resolution Adopting the Management Plan
{ 31 TAC §356.6(a)(2) }

Appendix C – Evidence of Management Plan Adoption after Notice and Hearing
{ 31 TAC §356.6(a)(3) }

Appendix D – Letter from the City of Sweetwater granting permission to use study
completed by LBG-Guyton (1997)

References

2001 Regional Water Management Plan, Region G – Regional Water Planning Group

Aquifers of the Edwards Plateau, Texas Water Development Board, Report 360, edited
by Mace, Angle and Mullican, February, 2004.

Aquifers of Texas, Texas Water Development Board, Report 345, by Ashworth and
Hopkins, November, 1995.

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Board, by Anaya, R. and Ridgeway, C., October 2004.

Groundwater Availability in Texas, Texas Department of Water Resources, Report 238,
by Muller, D.A. and Price, R.D., 1979.

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*Report on Potential Areas for Groundwater Development in the Vicinity of Sweetwater,
Nolan County, Texas*: LBG-Guyton Associates, Austin, Texas. February 1997. Used
with permission from the City of Sweetwater.

Water Use Survey, Estimated Water Use by Texas Counties, Water Uses Unit, TWDB,
Excel File downloaded on August 19, 2004.