Permian Basin Underground Water Conservation District

Management Plan
1998-2008

Effective September 1, 1998

Permian Basin Underground Water Conservation District

(915) 756-2136 • 207 N. Hwy 137 • P. O. Box 1314 • Stanton, Texas 79782

LET'S KEEP OUR WATER PURE AND PLENTIFUL

Management Plan 1998-2008

WHEREAS, the Permian Basin Underground Water Conservation District (the District) was created on April 25, 1985, by authority of HB 2382 of the 69th Texas Legislature; and

WHEREAS, the registered voters of the District confirmed the District's creation in September, 1985; and

WHEREAS, the District adopted a 10 year Management Plan in 1992, as required by the Texas Water Code; and

WHEREAS, SB 1, 75th Texas Legislature required the District to adopt a revised Management Plan as stated in Chapter 36.1071, Texas Water Code; and

WHEREAS, the revised Management Plan is required to be certified as administratively complete by the Executive Administrator of the Texas Water Development Board as stated in Chapter 36.1072, Texas Water Code; and

WHEREAS, the Board of Directors of the District have determined that a revision of the existing Management Plan is warranted; and

WHEREAS, The Board of Directors of the District have determined that the revised Management Plan adequately addresses the requirements of Chapter 36.1071, Texas Water Code; and

WHEREAS, the revised Management Plan shall become effective on September 1, 1998, upon adoption by the Board of Directors of the District and shall remain in effect until August 31, 2008, or until a revised Plan is adopted, whichever occurs first, therefore be it

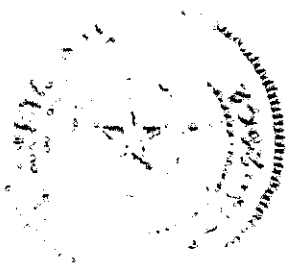
RESOLVED, that the Board of Directors of the Permian Basin Underground Water Conservation District hereby adopt the revised Management Plan; and further

RESOLVE that this revised Management Plan shall become effective on September 1, 1998.

Adopted this 31st day of August, 1998, by the Board of Directors of the Permian Basin Underground Water Conservation District.

John L. Campbell
John Campbell, President

Rufus Tom
Rufus Tom, Secretary



STATE OF TEXAS
COUNTY OF MARTIN
This instrument was acknowledged before me on the 31 day of August, 1998.

W. Anita Cox
Notary Public, State of Texas
Notary's Name Printed: W. Anita Cox

3/10/2001

Notary's Commission Expires:

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District Mission Statement

The Permian Basin Underground Water Conservation District (the District) will develop, promote, and implement management strategies to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater resources, over which it has jurisdictional authority, for the benefit of the people that the District serves.

Time Period for this Plan

This plan becomes effective September 1, 1998, upon adoption by the Board of Directors (the Board) of the District and remains in effect until a revised plan is approved or until August 31, 2008, whichever is earlier.

Guiding Principles

The District was formed, and has been operated from its inception, with the guiding belief that the ownership and pumpage of groundwater is a private property right. The Board will continue to support that right.

The Board is elected by the registered voters of the District, under the general Election laws of Texas. The rules promulgated to date by the Board were carefully thought out, were the result of specific needs, and were adopted after public input. These rules provide a fair and equitable opportunity for all water users to produce and use water from the aquifer for beneficial purposes. Interpretation and enforcement of the rules of the District are carried out by the District's staff, at the direction of the Board.

This management document is intended to be used as a tool to provide continuity in the management of the District. It will be used by the District staff as a guide to insure that all aspects of the goals of the District are carried out. It will be referred to by the Board for future planning, as well as a document to measure the performance of the staff on an annual basis.

Conditions can change over time which may cause the Board to modify this document. The dynamic nature of this plan shall be maintained such that the District will continue to best serve the needs of the constituents. At the very least, the Board will review and readopt this plan every five years.

One's goals, management objectives, and performance standards must be set at an attainable level in order to be realistic and effective. Lofty ideals penned in

an effort to be "all things to all people" can be the first step toward disaster.

Unreasonably elevated objectives foster potentially damaging results when the objective cannot be met due to a lack of resources; fiscal or technical. One's goals can also be set too low. Simplistic ideals can foster mediocrity. In both cases, the mission of the goal setting entity is thwarted and the benefactors of the same slighted. Although well meaning, when the failure to attain a goal is realized by those measuring performance, the initial response is to assume that those setting the goals were negligent in performing their duties when, in truth, the goals were unattainable from the start.

In the opinion of the Board, the goals, management objectives, and performance standards put forth in this planning document have been set at a reasonable level considering existing and future fiscal and technical resources. Conditions may change which could cause change in the management objectives defined to reach the stated goals. Whatever the future holds, the following guidelines will be used to insure that the management objectives are set at a sufficient level to be realistic and effective:

- The District's constituency will determine if the District's goals are set at a level that is both meaningful and attainable; through their voting right, the public will appraise the District's overall performance in the process of electing or re-electing Board members.
- The duly elected Board will guide and direct the District staff and will gauge the achievement of the goals set forth in this document.
- The interests and needs of the District's constituency shall control the direction of the management of the District.
- The Board will endeavor to maintain local control of the privately owned resource over which the District has jurisdictional authority.

General Description, Location and Extent

The District was created on April 25,1985 when Governor Mark White signed HB 2382, 69th Legislature, in to law. The District was confirmed by voter approval, the initial Board elected, and an ad valorem tax rate cap of $0.02/$100 valuation was set in an election held in September 1985. Table 1 lists the current Board of Directors, office held, precinct served, and term.

Table I: Board of Directors of the Permian Basin Underground Water Conservation District.

Office	Name	Precinct	Term Ends
President	John Campbell	At-Large	August 2002
Member	Vacant	# 1	
Member	Marvin Standefer	# 2	August 2002
Member	Vacant	# 3	
Secretary	Rufus Tom	# 4	August 2002
Member	Lloyd Robinson	# 5	August 2000

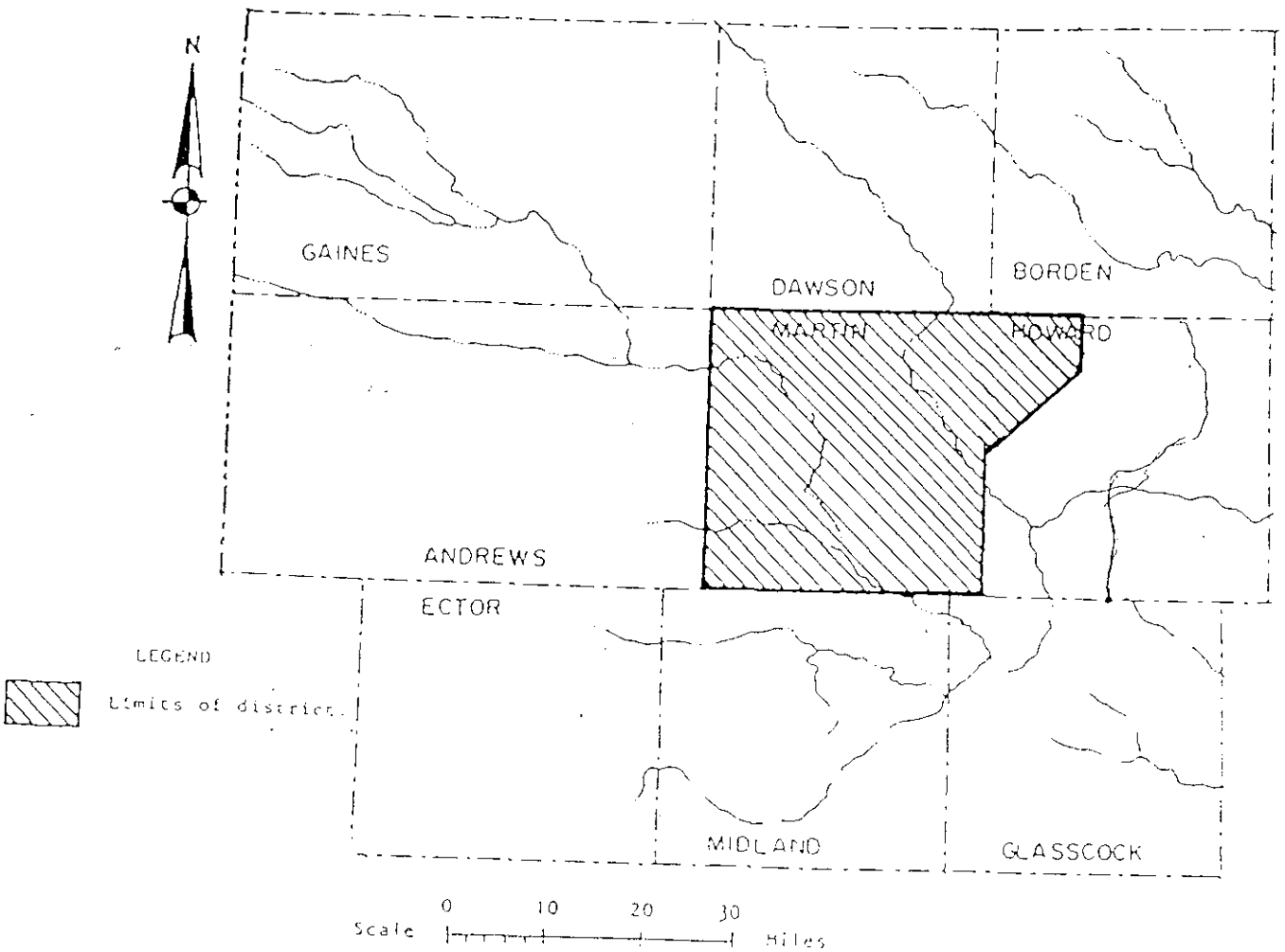
Originally, the jurisdictional extent of the District was the same as Martin County, Texas. However, in 1991, the voters in the northwest portion of Howard County approved the annexation of that portion of their county into the District.

The District now covers approximately 1066 square miles of west Texas (Figure 1). Stanton, the county seat of Martin County, is the largest municipality in the District, having a population of 2576.

The District is bordered on the west by Andrews County, on the north by Dawson and Borden Counties, on the south by Midland and Glasscock Counties, and on the east by that portion of Howard County that is not within the boundaries of the District.

The economy of the District is predominated by the oil and gas industry and to a lessor extent by agriculture. The major agricultural products coming from the area include beef cattle, cotton, and grain sorghum.

Figure 1: Location of the Permian Basin Underground Water Conservation District



Groundwater Resources

The District has jurisdictional authority over all groundwater that lies within the District's boundaries. There are two major aquifers that occur within the District: the Ogallala and the Edwards-Trinity (Plateau). The following is a description of these formations that may be beneficial to District constituents by providing useable quantities of groundwater.

Ogallala Aquifer

The Ogallala Aquifer is the primary source of groundwater in the District (Fig. 2). The aquifer extends from the ground surface downward, ranging in thickness from less than 20 feet to more than 100 feet in the area covered by the District.

The formation consists of heterogeneous sequences of clay, silt, sand and gravel. These sediments are thought to have been deposited by eastward flowing aggrading streams that filled and buried valleys eroded into pre-Ogallala rocks (Ashworth and Hopkins, 1995).

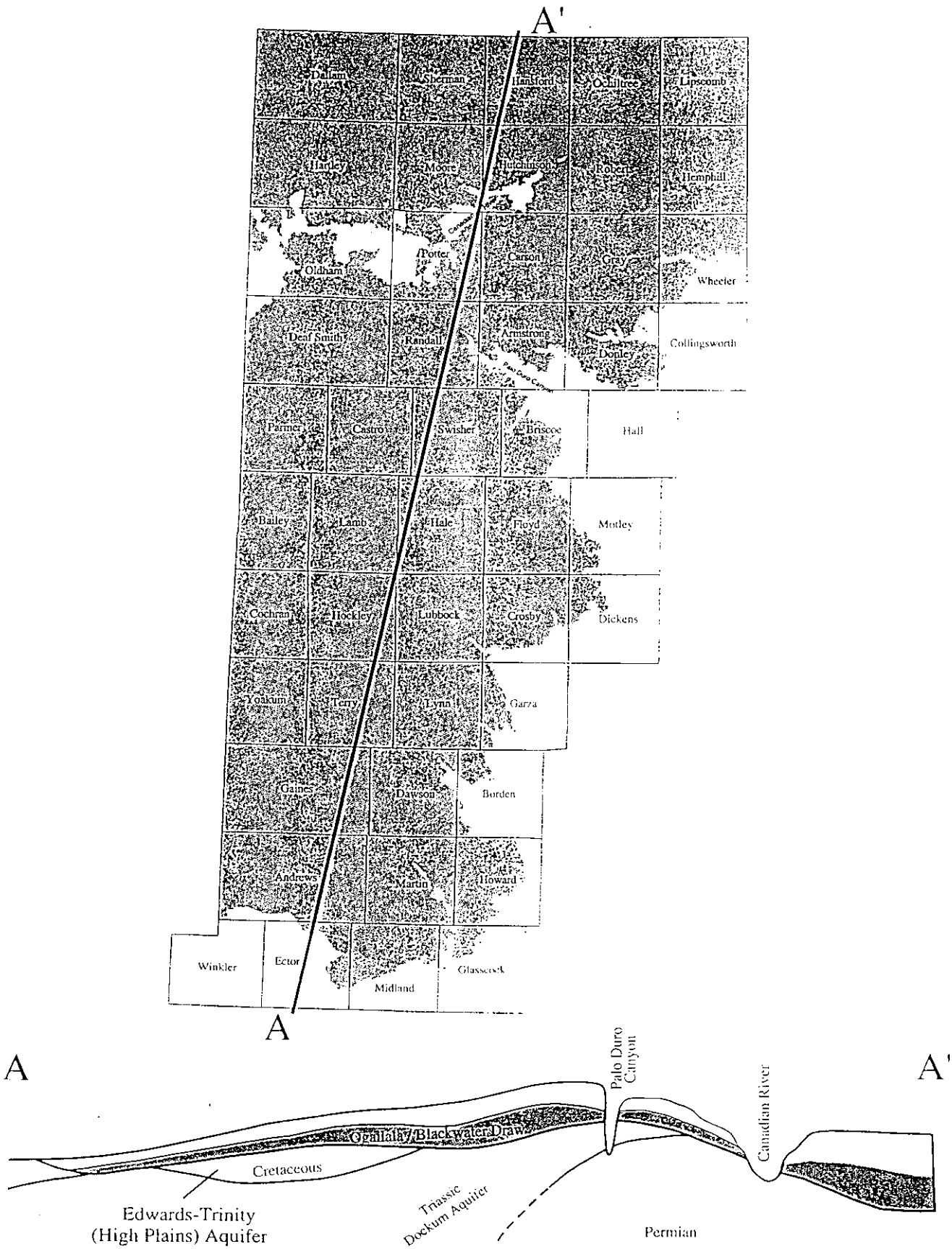
Water levels in the Ogallala Aquifer are primarily influenced by the rate of recharge to and discharge from the aquifer. Recharge to the aquifer occurs primarily by infiltration of precipitation falling on the surface.

Groundwater in the aquifer generally flows from northwest to southeast, normally at right angles to water level contours. Velocities of less than one foot per day are typical, but higher velocities may occur along filled erosional valleys where coarser grained deposits have greater permeabilities.

Discharge from the Ogallala aquifer within the District occurs through the pumping of wells; primarily irrigation wells. Groundwater pumpage typically exceeds recharge and results in water-level declines (Ashworth and Hopkins, 1995).

The chemical quality of Ogallala groundwater varies greatly across the District. Electrical conductance (EC) varies from less than 1.0 dS/m to over 4.0 dS/m. The suitability of groundwater for irrigation purposes is largely dependent on the chemical composition of the water and is determined primarily by the total concentration of soluble salts.

Figure 2: Aerial extent of the Ogallala Aquifer in Texas
(Adapted from Ashworth and Hopkins, 1995)



Edwards-Trinity (Plateau) Aquifer

The Edwards-Trinity (Plateau) Aquifer underlies a small portion of east central and southern Martin County within the District (Fig. 3). The aquifer consists of saturated sediments of lower Cretaceous age Trinity Group formations and overlying limestones and dolomites of the Edwards formations.

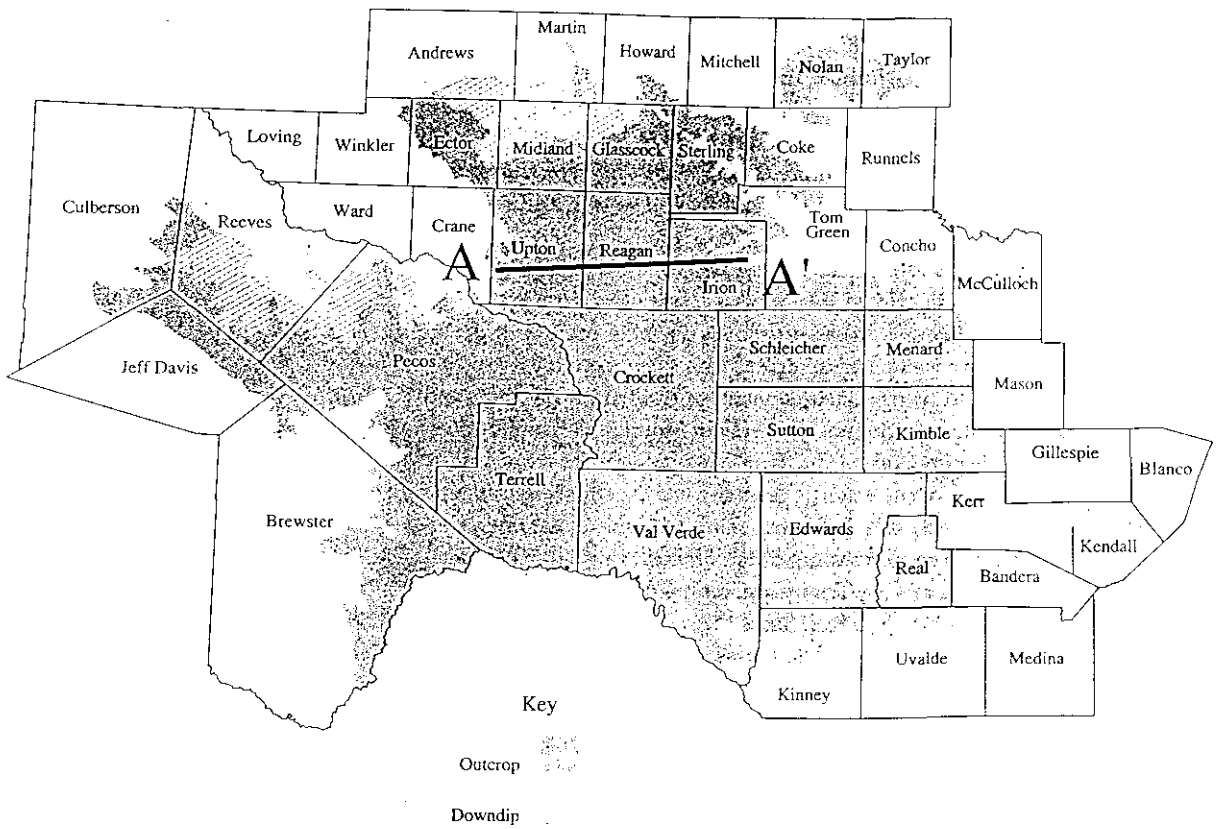
Chemical quality of the Edwards-Trinity (Plateau) water ranges from fresh to slightly saline. The water is typically hard and may vary widely in concentrations of dissolved solids made up mostly of calcium and bicarbonate. There is little pumpage from the aquifer, and water levels remain relatively constant.

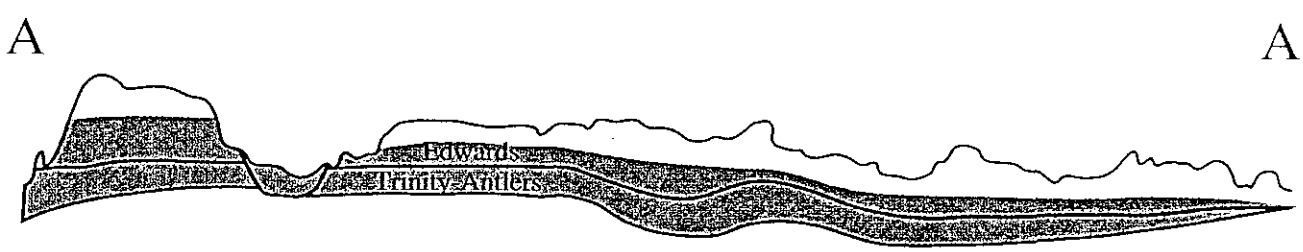
Surface Water Resources

The only fresh surface water occurring within the District are manmade stock tanks. The stock tanks play an important role in the watering of wildlife as well as livestock within the District.

Perhaps the most significant surface water resource of benefit to the District is water pumped from the Colorado River watershed to the City of Stanton. The Colorado River Municipal Water District is under contract to provide up to 2 million gallons per day of water to the city through their extensive pipeline system.

Figure 3: Aerial extent of the Edwards-Trinity (Plateau) Aquifer in Texas (Adapted from Ashworth and Hopkins, 1995)





Total Useable Amount of Groundwater

The Texas Water Development Board (TWDB) estimates that the total recoverable amount of groundwater underlying Martin County, Texas, in 1980 was approximately 3,542,550 acre-feet and the total recoverable amount of groundwater underlying the portion of Howard County, Texas, served by the District, in 1980 was approximately 131,366 acre-feet (Pedersen et al, 1997). The total useable amount of groundwater underlying the area served by the District in 1980 was, of course, dependent on the category of use because of quality limitations. For the purposes of this plan, to meet the requirements of 36.1072(e)(3)(A), Texas Water Code, and until more accurate data becomes available, we will assume that all of the groundwater underlying the District was useable in 1980 even though we suspect that not to be the case. Table 2 shows the TWDB estimation of the volume of groundwater in storage projected to the year 2030 for Martin County, Texas, and a portion of Howard County, Texas; the combination of which makes up the District. Please note that the information shown should be used only as a guide, and becomes less and less representative of actual conditions which will prevail the farther one looks into the future.

Table 2: Volume of Groundwater in Storage within the Permian Basin Underground Water Conservation District by decade period.(Adapted from Pedersen et al, 1997)

County	1980	1990	2000	2010	2020	2030
Maritn	4.40	4.30	4.23	4.04	3.94	3.83
Howard**	0.21	0.21	0.20	0.19	0.19	0.18
Total	**4.61**	**4.51**	**4.43**	**4.23**	**4.03**	**4.01**

*Volume expressed in millions of acre-feet
**Percentage portion of county total

Historical Groundwater Use

For the purposes of this plan, the following estimations (Table 3) of the historical quantity of groundwater used in the area served by the District will be used as a guide to estimate future demands on the resource in the District. It should be emphasized that the quantities shown are estimates.

Table 3: 1991-1995 Groundwater Use, by Category of Use, in the Permian Basin Underground Water Conservation District. (From TWDB Annual Survey of Ground and Surface Water)

Year	Municipal	Manufacturing	Power	Irrigation	Mining	Livestock	Total
1991	*11707	16	0	5827	1356	359	**19781**
1992	4483	0	0	13600	1351	347	**19781**
1993	9277	27	0	8788	1341	348	**19781**
1994	10779	41	0	7360	1341	260	**19781**
1995	6836	44	0	11705	897	299	**19781**

*Volume expressed in acre-feet

Recharge of the Aquifer System

Recharge of the aquifer system in the District occurs primarily from infiltration of precipitation falling on the land surface. The TWDB estimates that, within the District, the annual recharge rate is 8318 acre-feet (Pedersen et al, 1997).

Projected Groundwater Supply and Demand

Projecting groundwater supply and demand is an arduous process. In order to make such projections, one must predict trends of groundwater use. Assumptions must be made regarding population changes, changing agricultural cropping strategies, economic development patterns, and future weather patterns. Naturally, the farther into the future one projects, the less accurate the projections become.

For the purposes of this plan, the following supply and demand figures shown in Table 4 will be used. The figures were derived from combined numbers supplied by the TWDB.

Table 4: Projected Groundwater Supply and Demand for the Permian Basin Permian Basin Underground Water Conservation District by decade period. (Pedersen et al, 1997)

	2000	2010	2020	2030
Supply	28839	28866	28269	27071
Demand	20094	19469	19027	18601
Demand Met	144%	148%	149%	146%

*Quantities show in acre-feet per year

Management of Groundwater Resources

The District will endeavor to manage groundwater resources, over which it has jurisdictional authority, in order to conserve the resource while seeking to maintain the economic viability of the District's constituents. A water level monitoring network has been established in order to track changes in the total volume of groundwater in storage each year. The District will employ all technical resources at its disposal to monitor and evaluate the groundwater resource and programs designed to encourage conservation of the same.

In July, 1992, the Board, after notice and hearing, adopted the rules of the District. The rules address conservation of the groundwater resources of the District. As conditions dictate, and with the approval of the constituents of the District, the Board will consider the modification of the rules to further the mission of the District. When considering modification or enforcement of the rules, the Board will base its decisions on the best technical evidence available. All constituents will be treated equally and fairly when applying the rules of the District.

Drought Contingency Plan

From time-to-time, drought conditions exist on the Texas High Plains. In fact, many people have commented that this region is in a state of perpetual drought; the only difference being the severity of the condition from year-to-year due to very low average annual rainfall amounts. Drought response conservation measures typically used in other regions of Texas (i. e. rationing) cannot and are not used in this region due to extreme economic impact potential.

A contingency plan to cope with the effects of water supply deficits due to climatic or other conditions will be developed by the District and will be

adopted by the Board after notice and hearing. In developing the contingency plan, the District will consider the economic effect of conservation measures upon all water resource user groups, the local implications of the degree and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifers within the District, and the appropriate conditions under which to implement the contingency plan.

Goals, Management Objectives and Performance Standards

Method for Tracking the District's Progress in Achieving Management Goals

The District staff will prepare an annual report of the District's performance with regard to achieving management goals and objectives. The report will be prepared in a format that will be reflective of the performance standards listed following each management objective. The report will be presented to the Board within 60 days of the end of each fiscal year. The first annual report will be prepared upon completion of the 1998-99 fiscal period. Additionally, estimates of fiscal resources expended in the accomplishment of each objective will be included in the report. The report will be maintained on file in the open records of the District.

The District will actively enforce all rules of the District in order to conserve, preserve, protect and prevent the waste of the groundwater resources over which the District has jurisdictional authority. The Board will periodically review the currentness of the District's rules, and will modify the rules, with public approval, in order to more adequately manage the groundwater resources within the District and to carry out the duties prescribed in Chapter 36, Texas Water Code.

Goal 1.0 Implement management strategies that will protect and enhance the quantity of useable quality groundwater by encouraging the most efficient use.

Management Objective-Water Level Monitoring

1.01 Annually, measure the depth to water in 80% or more of the wells in the District's water level monitoring network; record all measurements and/or observations; enter all measurements into District's computer data base; file all field notes in District's filing system; maintain a network of measurement wells of 100 or more wells.

Performance Standards

1.01a Percent of water level monitoring wells wells for which measurements were recorded each year

1.01b Percent of water level monitoring wells for which field notes were written describing reason for inability to attain measurements each year

1.01c Number of data records entered into District's data base each year

1.01d Number of water level measurement wells for which field notes are filed in District's filing system each year

1.01e Number of wells in the water level measurement network each year

1.01f Number of wells added to the network, if required, each year

Management Objective-Laboratory Services

1.02 On an annual basis at the request of the constituents of the District, provide basic water quality testing service to at least 80% of those requesting the service. Maintain a record of all tests performed by entering the results of all tests in the District's computer data base. Communicate results to constituents requesting tests.

Performance Standards

1.02a Percent of laboratory service requests fulfilled each year

1.02b Number of records entered into District's computer data base each year

1.02c Percent of results communicated to constituents requesting tests each year

Goal 2.0 Implement management strategies that will protect and enhance the quantity of usable quality groundwater by controlling and preventing waste.

Management Objective-Well Permitting and Well Completion

2.01 On an annual basis, at the request of the constituents of the District, issue temporary water well drilling permits for the drilling and completion of non-exempt water wells in the District within 20 days of application. Inspect all well sites to be assured that the District's completion and spacing standards are met. Send written notification to the well owner if the well fails to meet standards within 30 days of inspection. The Board will vote on final approval of the permit at the next regularly scheduled meeting after the well site has been inspected and District well completion standards have been met.

Performance Standards

2.01a Average number of days taken to issue drilling permit after request each year

2.01b Number of water well drilling permits issued each year

2.01c Number of well sites inspected after well completion each year

2.01d Number of well sites that fail to meet the standards of the District each year

2.01e Average number of days taken to mail notification letters each year

Management Objective-Open or Uncovered Wells

2.02 Annually, the District will inspect all sites reported of open or uncovered wells to substantiate or refute that an open or uncovered well exists. If an open or uncovered well is found, the District will insure that the open hole is properly closed according to District rules and, in so doing, prevent potential contamination of the groundwater resource. The reports shall be filed on forms provided by the District in order to track the progress of the closure process. The District will contact the party responsible for the open or uncovered well within 30 days of same being reported. The site will be inspected after notification to ensure the well closure process occurs within 60 days of the initial contact with the responsible party. If the well is not closed by the end of the 60 day period, the District will close the well in accordance with the District rules.

Performance Standards

2.02a Number of open or uncovered wells reported to the District each year

2.02b Number of initial inspections accomplished each year

2.02c Average number of days required to make initial contact with responsible party each year

2.02d Average number of days required to complete closure of open or uncovered wells each year

2.02e Percentage of wells remaining open or uncovered after 60 day period that are closed in accordance with District rules each year

Management Objective-Salt Water Disposal Well Monitoring

1.01 Annually, inspect 80% or more of the known salt water disposal wells located within the District's boundaries for indications of pollution potential; record all findings at each well site; file all field notes in District's filing system.

Performance Standards

1.01a Percent of salt water disposal well sites inspected each year

1.01b Percent of inspections for which field notes were recorded and filed each year

Goals not Applicable

The following goals referenced in Chapter 36, Texas Water Code, have been determined not applicable to the District;

§ 36.1071(a)(3) Controlling and preventing subsidence
§ 36.1071(a)(4) Addressing conjunctive surface water management issues
§ 36.1071(a)(5) Addressing natural resource issues

References

Ashworth, J. B. and Hopkins, J., 1995, Aquifers of Texas: Texas Water Development Board Report 345, 69 p.

Pederson, C. D., et al, 1997, Water for Texas: A Consensus Based Update to the State Water Plan: Texas Water Development Board, 3 vol.