

A photograph of a stream flowing over rocks, with dry reeds and branches in the background. The water is dark and has some white foam where it flows over the rocks. The text is overlaid on the image.

**GROUND WATER MANAGEMENT AREA 7  
JOINT PLANNING AND  
PROTECTING PROPERTY RIGHTS IN WATER**

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# ACRE-FOOT

◆ **325,851 gallons –enough to cover one acre of land with one foot of water**

◆ *enough to flood a football field—end line to end line and sideline to sideline—9 inches deep*

◆ *not quite half the water needed to fill an Olympic swimming pool*

◆ *enough water to last a family of four for up to two years. If that family has a large 4000 sq ft two-story home they would need a water tower as big as their house—including the attic and a two- to three-car garage—to store an acre-foot of water.*

# OWNERSHIP OF WATER IN TEXAS

- ❖ Surface water is owned by the State of Texas  
The beds of streams designated as “**navigable**” streams –generally those that are 30 feet wide from “cut bank” to “cut bank” – are owned by the state.  
Beds of **non-navigable** streams are owned by the owner of the property through which they flow.
- ❖ Groundwater is owned by the overlying property owner.

# Property Rights in Surface Water

- Although the State of Texas owns the water in rivers, streams, and lakes, landowners alongside them own “usufructory rights” – a right of use - in surface water.
- These are real property rights that transfer with the property unless the landowner specifically reserves them in the deed conveying the property.

# REGULATION OF SURFACE WATER RIGHTS

- The Texas Commission on Environmental Quality is the State agency which has the statutory authority to regulate surface water rights

There are two kinds of surface water rights:

A) Riparian

B) Appropriated

# RIPARIAN RIGHTS

Exempt from requirement of TCEQ permit

## Domestic and livestock ( D&L ) use:

- water used to water range livestock, meet household needs, or irrigate a yard or home garden.
- D&L use is exclusive to the owner of property adjoining a stream. He may not sell the water or the water right separately from the land - if he sells the property, this exemption stays with the property

# RIPARIAN RIGHTS

- A riparian owner may impound livestock water in stock tanks on his property, provided that the average volume of water stored in any 12 consecutive months is 200 acre-feet or less
- In 2001, the Legislature added wildlife management as an exempt use for which you may build a dam or reservoir on your property.



# RIPARIAN WATER RIGHTS

- A riparian landowner may not build an impoundment in the streambed of a river classified as “navigable”., but may build one in a non-navigable stream.

▪

# APPROPRIATED RIGHTS

- In all other cases, before you can use surface water, you first need permission from the state in the form of either a Certificate of Adjudication or a permit.
- To clearly distinguish between rights to water for exempt use and a documented water right, the documented rights are referred to as appropriated water rights

# APPROPRIATED RIGHTS

The TCEQ sets the conditions for use of surface water in Certificates of Adjudication and permits: the amount which may be diverted, where and for what use it may be diverted, and at what rate of flow.

# Certificates of Adjudication

- . In 1967, the Texas Legislature directed the Texas Water Rights Commission to settle the confusion of claims to use of surface water.
- The Water Rights Commission adjudicated the rights in every river basin in the State, considering the evidence of prior use in setting up the foundation for the current prior-appropriation water-rights system in Texas.



# PRIOR APPROPRIATION DOCTRINE: “FIRST IN TIME, FIRST IN RIGHT”

Claimants had to demonstrate:

- ◆ that they had used a certain amount of water at a specified rate, for certain purposes, from a specific stretch of a river, stream, or reservoir; and
- ◆ the first date they had used that volume of water.

# PROPERTY RIGHTS IN GROUNDWATER

Sec. 36.002. OWNERSHIP OF  
GROUNDWATER. (a) The legislature  
recognizes that a landowner owns the  
groundwater below the surface of the  
landowner's land as real property.

# PROPERTY RIGHTS IN GROUNDWATER

- Sec. 36.002 (b) The groundwater ownership and rights described by this section:
- (1) entitle the landowner, including a landowner's lessees, heirs, or assigns, to drill for and produce the groundwater below the surface of real property, subject to Subsection (d), without causing waste or malicious drainage of other property or negligently causing subsidence,

## Sec. 36.002 (b) (continued)

- but does not entitle a landowner, including a landowner's lessees, heirs, or assigns, to the right to capture a specific amount of groundwater below the surface of that landowner's land; and
- (2) do not affect the existence of common law defenses or other defenses to liability under the rule of capture.



# Section 36.002(d) TWC

- (d) This section does not:
  - (1) prohibit a district from limiting or prohibiting the drilling of a well by a landowner for failure or inability to comply with minimum well spacing or tract size requirements adopted by the district;
  - (2) affect the ability of a district to regulate groundwater production as authorized under Section 36.113, 36.116, or 36.122 or otherwise under this chapter...

# GROUNDWATER CONSERVATION DISTRICTS

were created by the Texas Legislature Section under Section 36.015 of the Texas Water Code “to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs”

Section 36.015 TWC: “Groundwater conservation districts ... are the state's preferred method of groundwater management through rules developed, adopted, and promulgated ... in accordance with the provisions of this chapter.”

# BALANCING INTERESTS IN WATER

Groundwater conservation districts  
must balance  
various competing interests in groundwater



# BALANCING

Allocation of water for competing uses  
**within the district:**

- Agricultural
- Municipal public water supply
- Oil and Gas and mining exempt uses
- Industrial
- Recreational
- Environmental

# Section 36.101(a) (1)-(3) TWC

In adopting a rule under this chapter, a district shall:

- (1) consider all groundwater uses and needs;
- (2) develop rules that are fair and impartial;
- (3) consider the groundwater ownership and rights described by Section 36.002;

# Section 36.101 (a)(4) TWC

- (4) consider the public interest in conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, and in controlling subsidence caused by withdrawal of groundwater from those groundwater reservoirs or their subdivisions.

## 36.117 – Wells Exempt from Permitting- Domestic and Livestock

- (b) A district may not require any permit issued by the district for:
  - (1) a well used solely for domestic use or for providing water for livestock or poultry on a tract of land larger than 10 acres that is either drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater a day;



# 36.117 – Wells Exempt from Permitting- Oil and Gas

b)(2) the drilling of a water well used solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the Railroad Commission of Texas provided that the person holding the permit is responsible for drilling and operating the water well and the well is located on the same lease or field associated with the drilling rig; or

# 36.117 – Wells Exempt from Permitting- Mining

- b (3) the drilling of a water well authorized under a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code, or for production from such a well to the extent the withdrawals are required for mining activities regardless of any subsequent use of the water.

# Balancing

- Maximizing production of water for economic use v. conserving water for the future and protection of the resource

# Balancing

- Balancing the rights of surface water rights owners and groundwater rights owners

# § 36.113 TEXAS WATER CODE

## § 36.113. PERMITS FOR WELLS.

(d) Before granting or denying a permit, **the district shall consider** whether:

(1) the application conforms to the requirements prescribed by this chapter and is accompanied by the prescribed fees;

(2) **the proposed use of water unreasonably affects existing groundwater and surface water resources or existing permit holders;**

(3) the proposed use of water is dedicated to any beneficial use;

(4) the proposed use of water is consistent with the district's certified water management plan;

(5) the applicant has agreed to avoid waste and achieve water conservation;

# Balancing

- **Balancing the water supply needs among districts** with different economic uses and widely varying yields from the aquifer with the requirement to manage groundwater resources on an aquifer-wide basis

# Balancing

## Balancing in-district use with out-of-district use

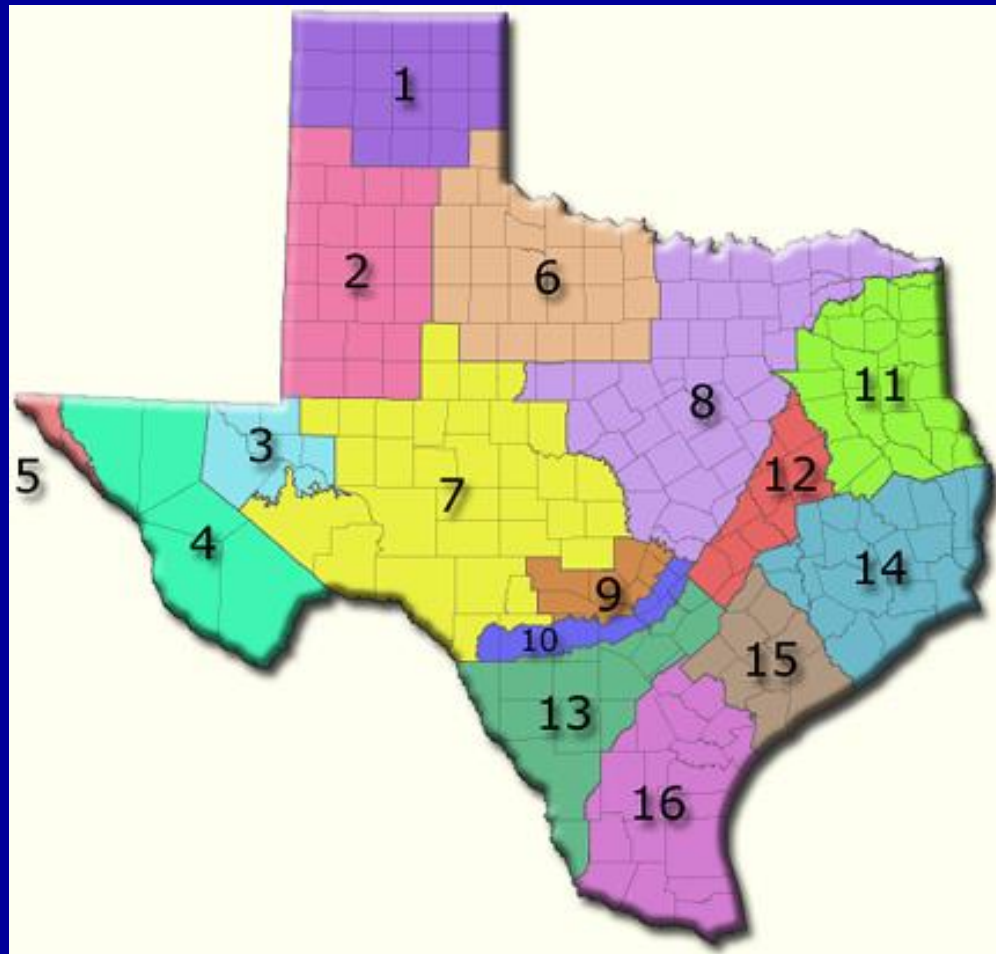
- Historic out-of-district surface water use vs. growth in in-district groundwater use
- In-district economic uses vs. out-of-district municipal growth

# THE JOINT PLANNING PROCESS

- The passage of HB 1763 in 2005 required that all districts within each Groundwater Management Area meet and adopt , every 5 years, Desired Future Conditions (DFCs) for their aquifers.
- The DFCs are submitted to the TWDB, which use Groundwater Availability Models to determine Modeled Available Groundwater.



# Groundwater Management Areas



# DESIRED FUTURE CONDITIONS (DFCs)

The condition in which groundwater conservation districts within a GMA desire the respective relevant aquifers to be fifty years from the start of the planning cycle

# Desired Future Conditions

May be based on:

- a) a target percentage of depletion over 50 years, or
- b) desired water quality, or
- c) maintenance of spring and surface water flows; or
- d) other relevant objective standards

# GROUNDWATER AVAILABILITY MODEL (GAM)

Computer models which simulate the operation of aquifers when various inputs are changed.

Once the GMA has adopted the DFCs, they are submitted to the Texas Water Development Board which uses GAMS to determine the MAGs

# MODELED AVAILABLE GROUNDWATER (MAG)

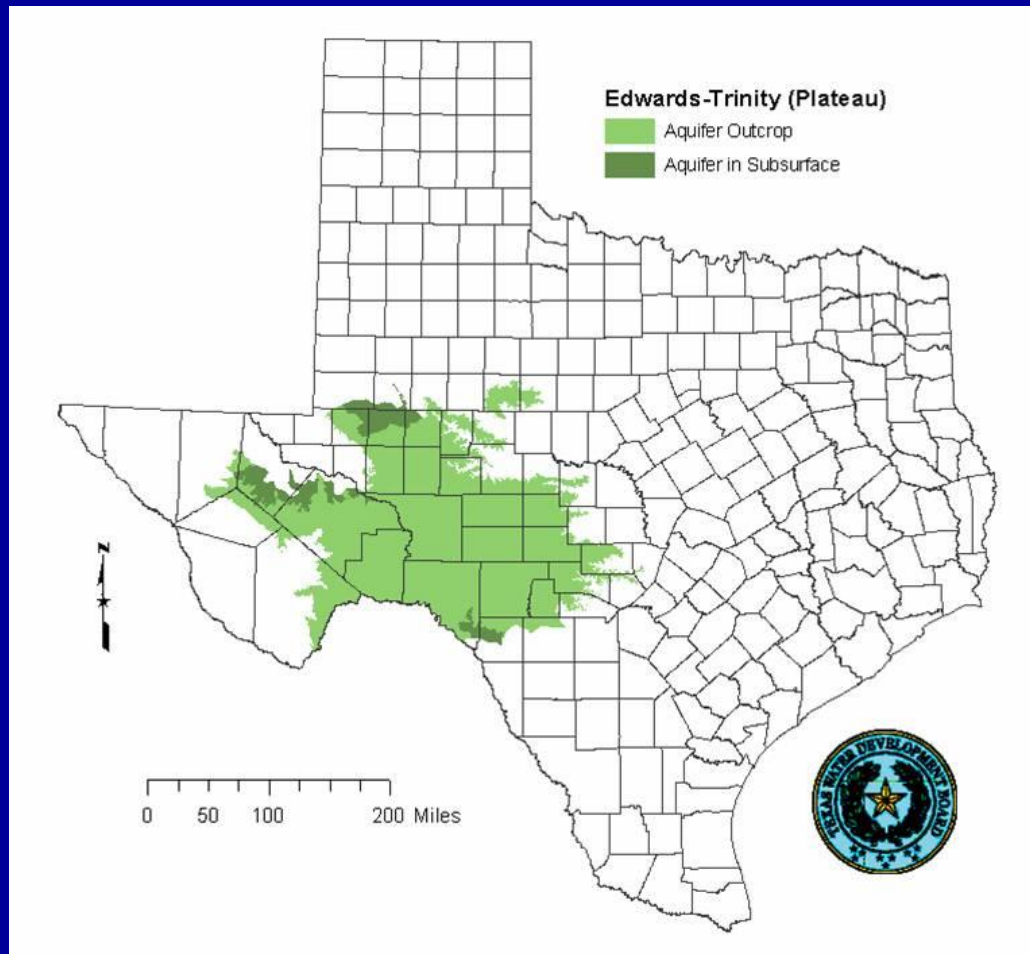
The amount of water:

- available for permitted production in an aquifer
- which will implement the attainment or maintenance of the Desired Future Condition

# Major Aquifers in GMA 7

- Edwards-Trinity (Plateau)
- Ogallala
- Pecos Valley Alluvium
- Trinity

# Edwards-Trinity (Plateau) Aquifer

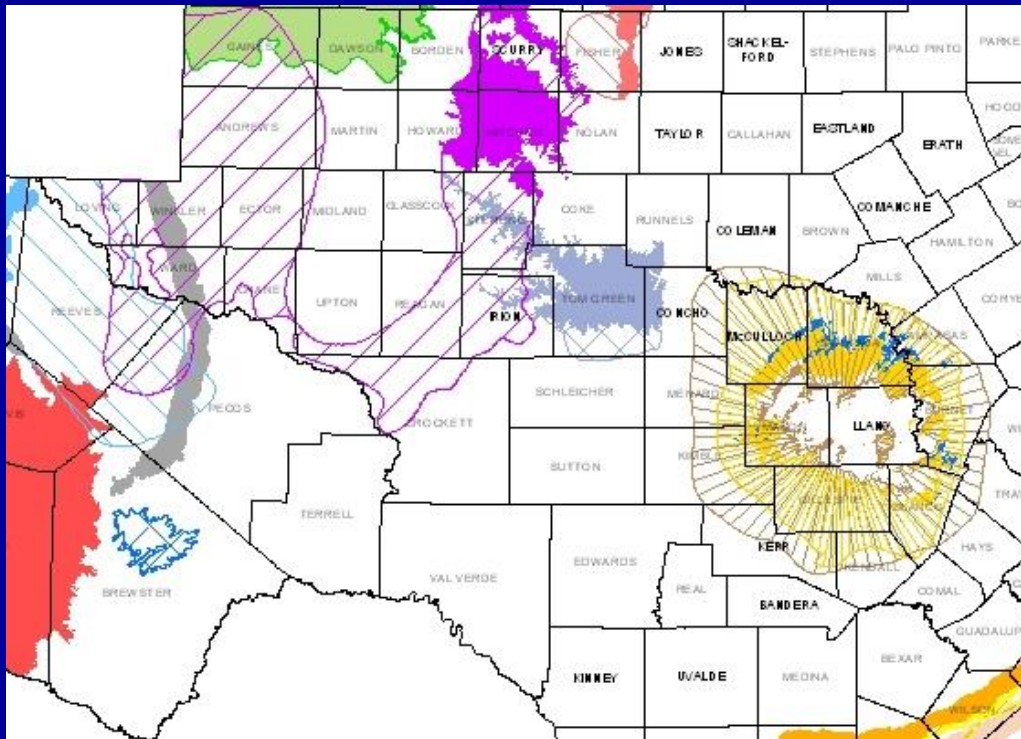


# Minor Aquifers in GMA 7

- Capitan Reef
- Dockum
- Ellenburger-San Saba
- Hickory
- Lipan
- Marble Falls



# Minor Aquifers of GMA 7



## Legend

- |                       |                                  |
|-----------------------|----------------------------------|
| Brazos River Alluvium | Rita Blanca                      |
| West Texas Bolsons    | Edwards - Trinity (High Plains)  |
| Lipan (outcrop)       | Dockum (outcrop)                 |
| Lipan (subcrop)       | Dockum (subcrop)                 |
| Yegua Jackson         | Rustler (outcrop)                |
| Igneous               | Rustler (subcrop)                |
| Sparta (outcrop)      | Capitan Reef Complex             |
| Sparta (subcrop)      | Blaine (outcrop)                 |
| Queen City (outcrop)  | Blaine (subcrop)                 |
| Queen City (subcrop)  | Bone Spring - Victorio Peak      |
| Nacatoch (outcrop)    | Marble Falls                     |
| Nacatoch (subcrop)    | Marathon                         |
| Blossom (outcrop)     | Ellenburger - San Saba (outcrop) |
| Blossom (subcrop)     | Ellenburger - San Saba (subcrop) |
| Woodbine (outcrop)    | Hickory (outcrop)                |
| Woodbine (subcrop)    | Hickory (subcrop)                |

NOTE: Chronology by Geologic age.

OUTCROP (portion of a water-bearing rock unit exposed at the land surface)  
 SUBCROP (portion of a water-bearing rock unit existing below other rock units)

# Section 36.108(d-2)

- (d-2) The desired future conditions proposed under Subsection (d) **must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater and control of subsidence in the management area.**

## Sec. 36.108(d-2)

- This subsection does not prohibit the establishment of desired future conditions that provide for the reasonable long-term management of groundwater resources consistent with the management goals under Section 36.1071(a).





all of Texas' largest springs burst  
from Edwards and associated  
limestones —

Gunnar Brune  
*Springs of Texas, 1981*



# **HEADWATERS of RIVERS LOCATED IN GROUNDWATER MANAGEMENT AREA 7**

## **RIO GRANDE RIVER BASIN**

**West Nueces and Nueces**

**Frio**

**Devils**

**Dry Devils**

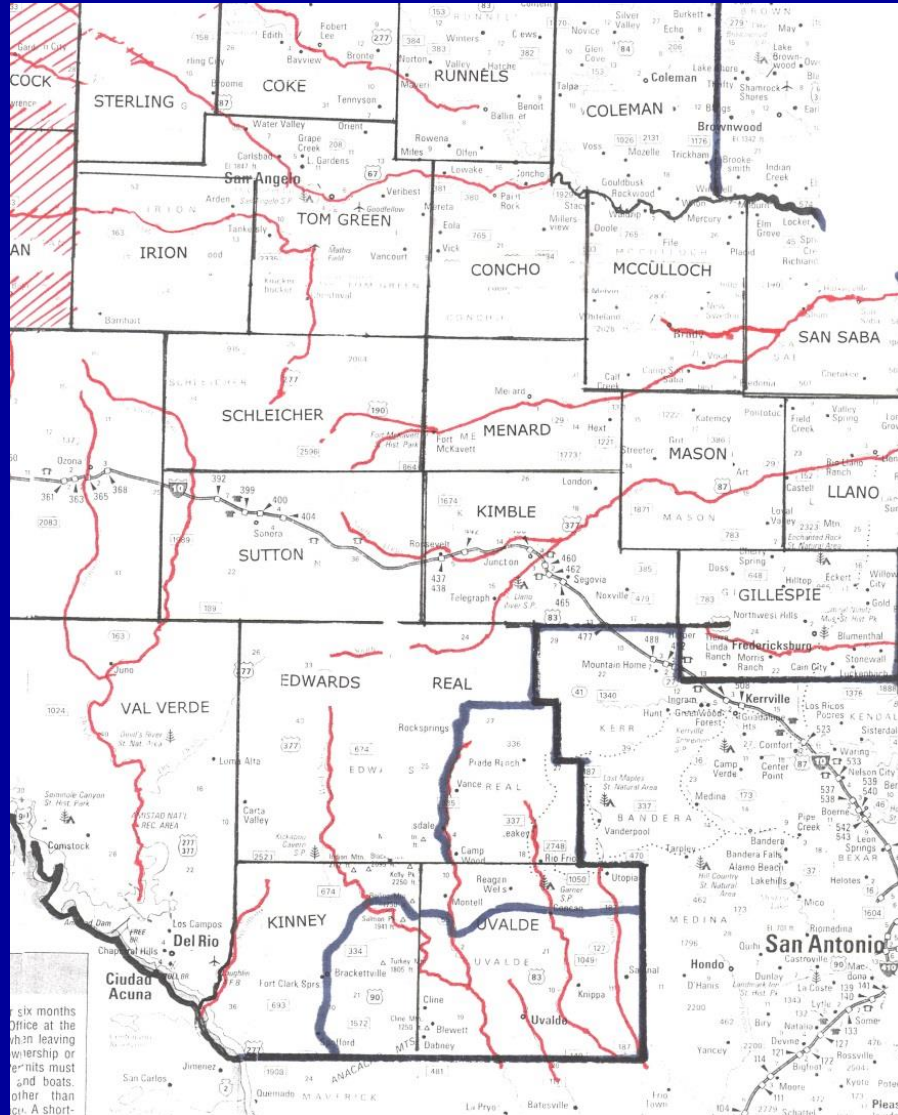
## **COLORADO RIVER BASIN**

**North Llano, South Llano, and Llano**

**South Concho**

**San Saba**

# RIVERS IN GMA 7

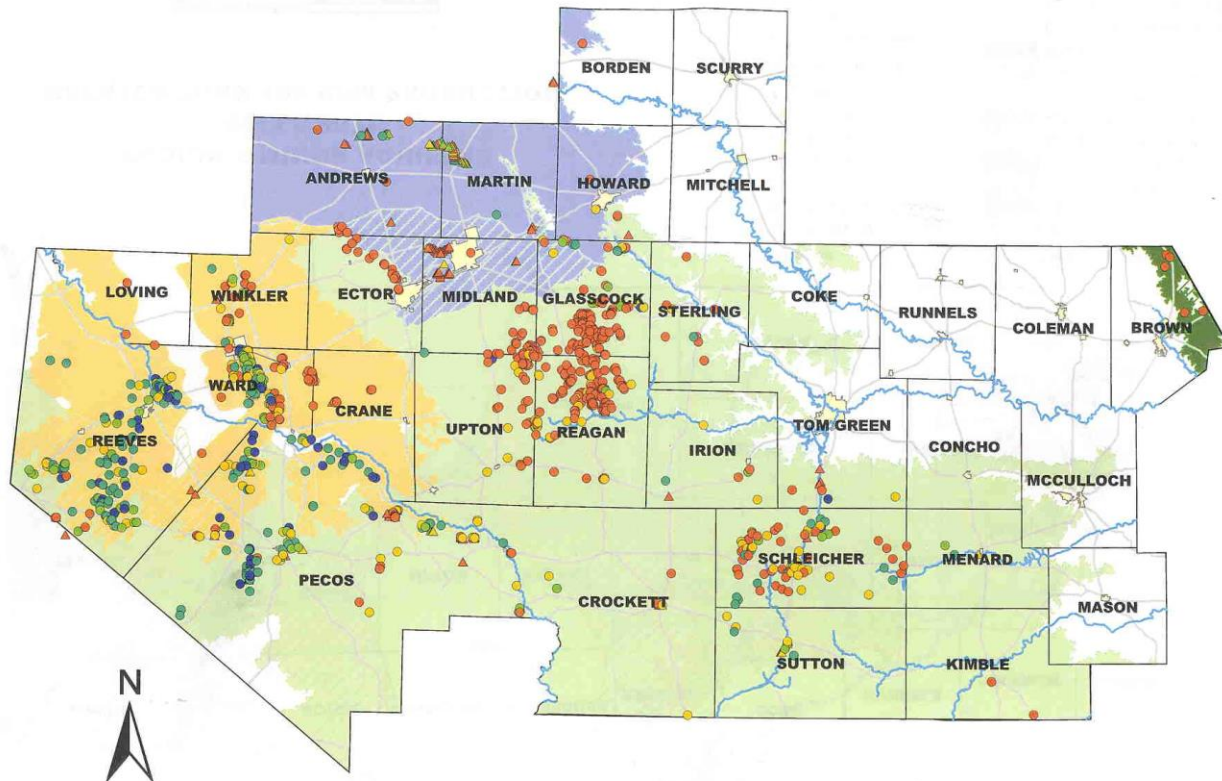


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## CONTRIBUTIONS TO STREAMFLOWS FROM THE EDWARDS-TRINITY (PLATEAU) AQUIFER (acre-feet)

County	GAM 09-35	GAM 07-32	Wells	Storage	Recharge	Springs, Streams & Rivers	
Crockett	5,475	5,493		11,983	30,263	-8,698	
Edwards	5,659	7,793		-2,987	55,471	-5,255	net lateral outflows -47,799
Gillespie	5,000	3,970	3,970	-2317	39,862	-28,562	
Kimble	1,400	843	559	-1,285	14,134	-41,585	
Kinney	65,000	6,832	6,832	1,150	35,541	-17,980	
Mason	150	3	0	-162	1,925	-2,747	
McCulloch	20	31	29	-785	5,057	-5,255	
Menard	2,580	1,844	927	2,127	15,453	-15,601	
Real	7,533	11,525	11,524	41	16,822	-1,341	net stream inflows of 7,967
Schleicher	8,060	3,732	3,723	4,487	16,970	-2,583	net lateral outflows -17,250
Sutton	6,450	3,445	3,445	3,924	20,413	-17,608	
Uvalde	2,000	742	6,284	583	21,334	-15,035	net lateral inflows of 3500
Val Verde	25,000	14,562	14,405	3,052	57,165	-86,458	net lateral inflows of 65,427

# Region F Well Yield Map



**REGION F WELL PRODUCTION  
(greater than 100 gpm)  
MAJOR AQUIFERS**



**TWDB Wells**

- 100 - 250
- 251 - 500
- 501 - 750
- 751 - 1250
- 1251 - 5000

**TCEQ Public Supply Wells**

- ▲ 100 - 250
- ▲ 251 - 500
- ▲ 501 - 750
- ▲ 751 - 1250
- ▲ 1251 - 2320

**Major Aquifers**

- PECOS VALLEY ALLUVIUM
- OGALLALA
- EDWARDS-TRINITY (PLATEAU) - OUTCROP
- EDWARDS-TRINITY (PLATEAU) - DOWNDIP
- TRINITY - OUTCROP
- TRINITY - DOWNDIP

**FIGURE 7**



# Effect of Drought on Recharge to the Aquifer

	Crockett	Edwards	Kimble	Real	Schleicher	Sutton	Val Verde
<b>Area (acres)</b>	1,796,480	1,356,800	800,640	448,000	839,040	929,920	2,068,480
<b>Calculated Recharge Rate</b>	0.34	1	2	2.14	0.8	1	0.63
<b>Calculated Recharge</b>	50,900	146,987	100,080	79,893	55,936	77,493	108,595
<b>Recharge at 90% Precipitation</b>	13,474	101,760	69,055	63,840	34,610	48,821	38,784
<b>Recharge at 80% Precipitation</b>	0	59,360	43,034	46,480	11,537	22,086	0
<b>Recharge at 70% Precipitation</b>	0	1,837	2,127	5,193	0	0	0

# Drawdown Impacts on Neighboring Districts

County	Continuation of 2005		Scenario 1		Scenario 10	
	Pumping (AF/yr)	Drawdown in 2060 (ft)	Pumping (AF/yr)	Drawdown in 2060 (ft)	Pumping (AF/yr)	Drawdown in 2060 (ft)
Coke	202	0	300	0	1,000	0
Concho	302	0	350	0	490	0
Crockett	4,636	4	5,475	8	5,475	9
Ector	4,788	1	5,534	7	5,534	7
Edwards	3,002	0	7,782	2	5,659	2
Gillespie	3,211	3	5,000	5	5,000	5
Glasscock	40,556	19	59,252	31	65,177	34
Irion	2,075	4	2,300	8	2,300	10
Kimble	847	1	1,000	1	1,400	1
Kinney	59,161	0	65,000	0	65,000	0
McCulloch	91	0	150	0	150	0
Mason	12	0	20	0	20	0
Menard	1,005	0	1,843	0	2,580	1
Midland	11,970	6	21,130	9	23,243	10
Nolan	351	0	500	0	700	0
Pecos	178,157	5	220,000	9	240,000	11
Reagan	40,576	17	62,039	32	68,243	37
Real	3,500	1	11,468	6	7,533	4
Schelicher	4,209	3	6,200	6	8,060	8
Sterling	2,062	3	2,500	5	2,500	6
Sutton	3,794	2	4,000	5	6,450	6
Taylor	300	0	350	0	490	0
Terrell	998	1	1,031	2	1,443	2
TomGreen	1,699	1	2,000	2	2,800	2
Upton	13,951	7	20,341	12	22,375	13
Uvalde	1,801	1	2,000	3	2,000	2
ValVerde	19,075	1	25,000	1	25,000	1
GMA 7	402,331	4	532,565	6	570,622	7

# 2010 DFCs

## Edward-Trinity (Plateau) Aquifer

