Post Oak Savannah Groundwater Conservation District Annual Update

Presented to

Milam Co. Commissioner's Court

November 23, 2015

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Serving the citizens of Milam and Burleson Counties

Update Agenda

1. Overview of Responsibilities/Purpose
2. 2015 Highlights
3. 2016 Budget Highlights

POSGCD Overview- Responsibilities

HB1784, 77th Leg. (Enabling Act)

SECTION 1.02. PURPOSE. The purpose of this Act is:
(1) to ratify and create locally controlled groundwater districts in order to protect and recharge groundwater and to prevent pollution or waste of groundwater in the central Carrizo-Wilcox area, to control subsidence caused by withdrawal of water from the groundwater reservoirs in that area, and to regulate the transport of water out of the boundaries of the districts;

Chapter 36, Texas Water

SECTION 36.0015. PURPOSE. In order 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... Groundwater conservation districts... are the state's preferred method of groundwater management...

Overview- Ownership of Groundwater

TWC 36.002 states: The groundwater ownership and rights described by this section: (1) entitle the landowner,... to drill for and produce the groundwater below the surface of real property, ... without causing waste or malicious drainage of other property or negligently causing subsidence, but does not entitle a landowner,... 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**.

2015 Highlights

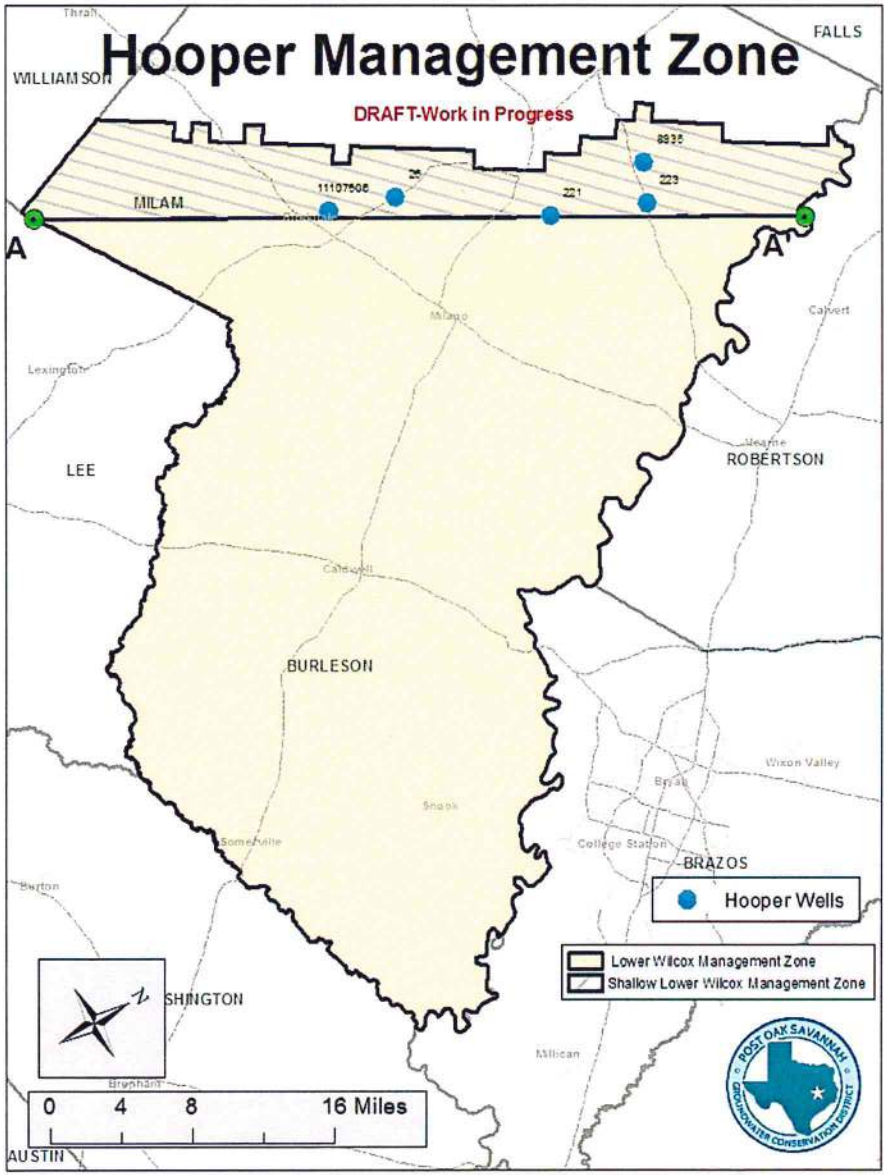
1. Legislative Session
2. TCEQ Petition
   -Accomplish DFCs
   -Monitoring Assignments
3. Education
4. Groundwater Conservation Grants
5. Monitoring Evaluations

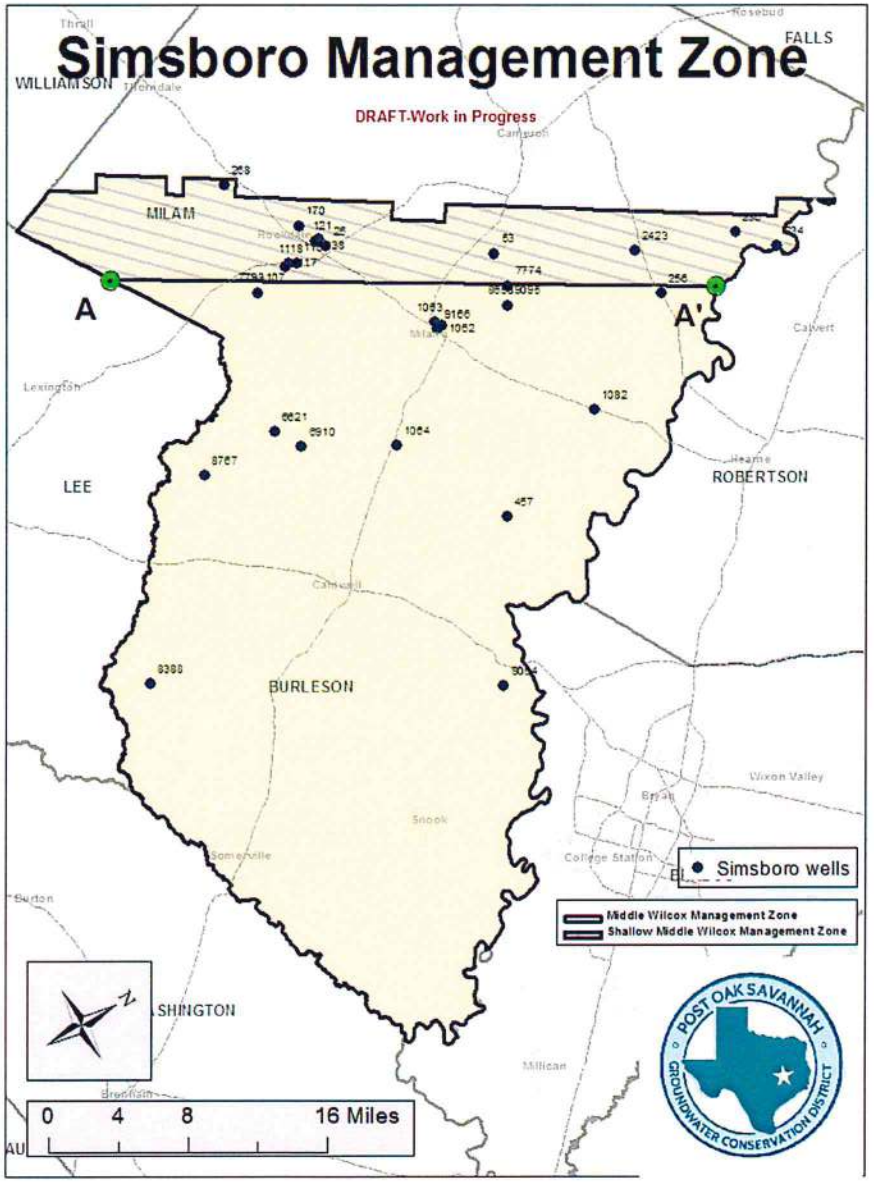
POSGCD Management- Equitable & Flexible

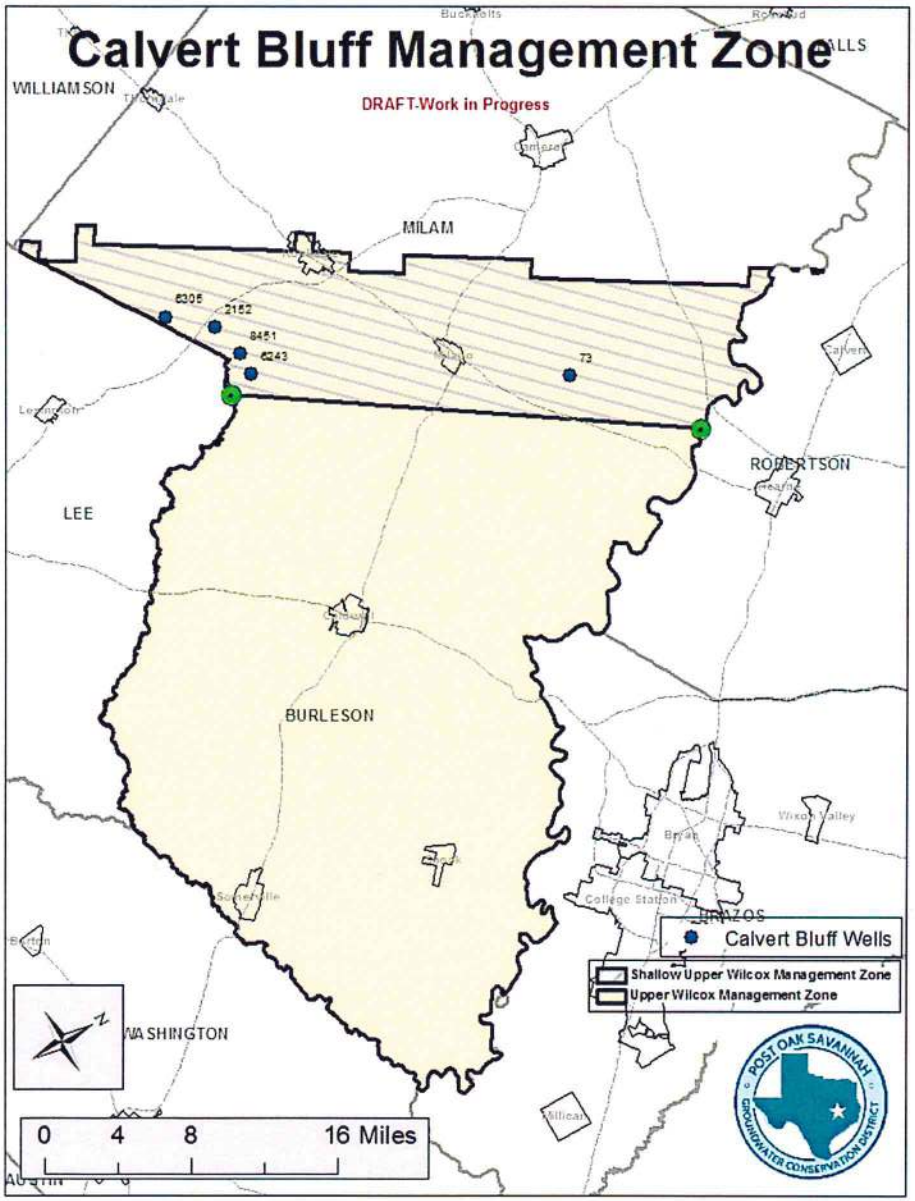
- Focus on aquifer conditions through monitoring wells
- Equitably respects private property rights in groundwater while protecting water levels in aquifers
- Equitable distribution of resource at any given time-
- Permits are contingent upon availability of resource
- Includes equitable curtailment of permits if necessary, primarily based on max allowable production/acre
- Local Water Utilities are exempt from curtailment

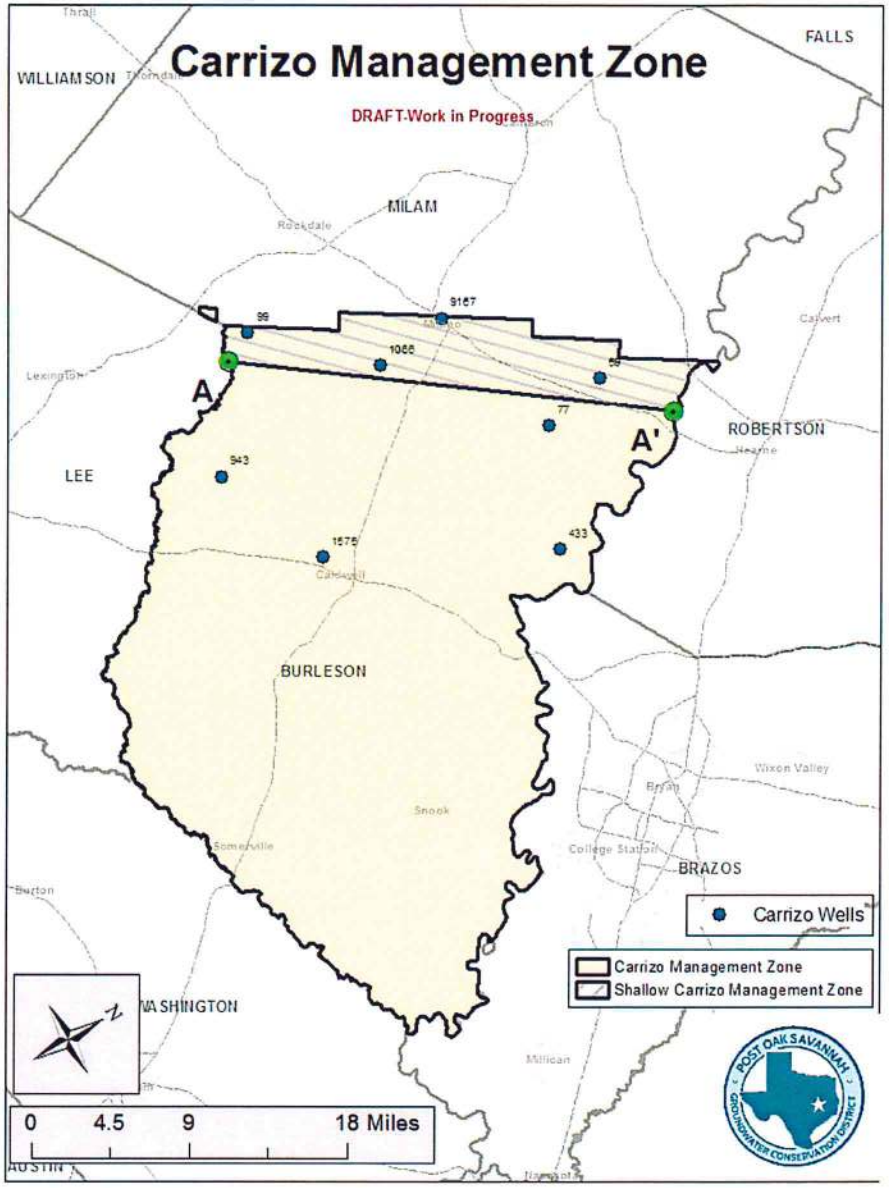
POSGCD tools to protect water levels

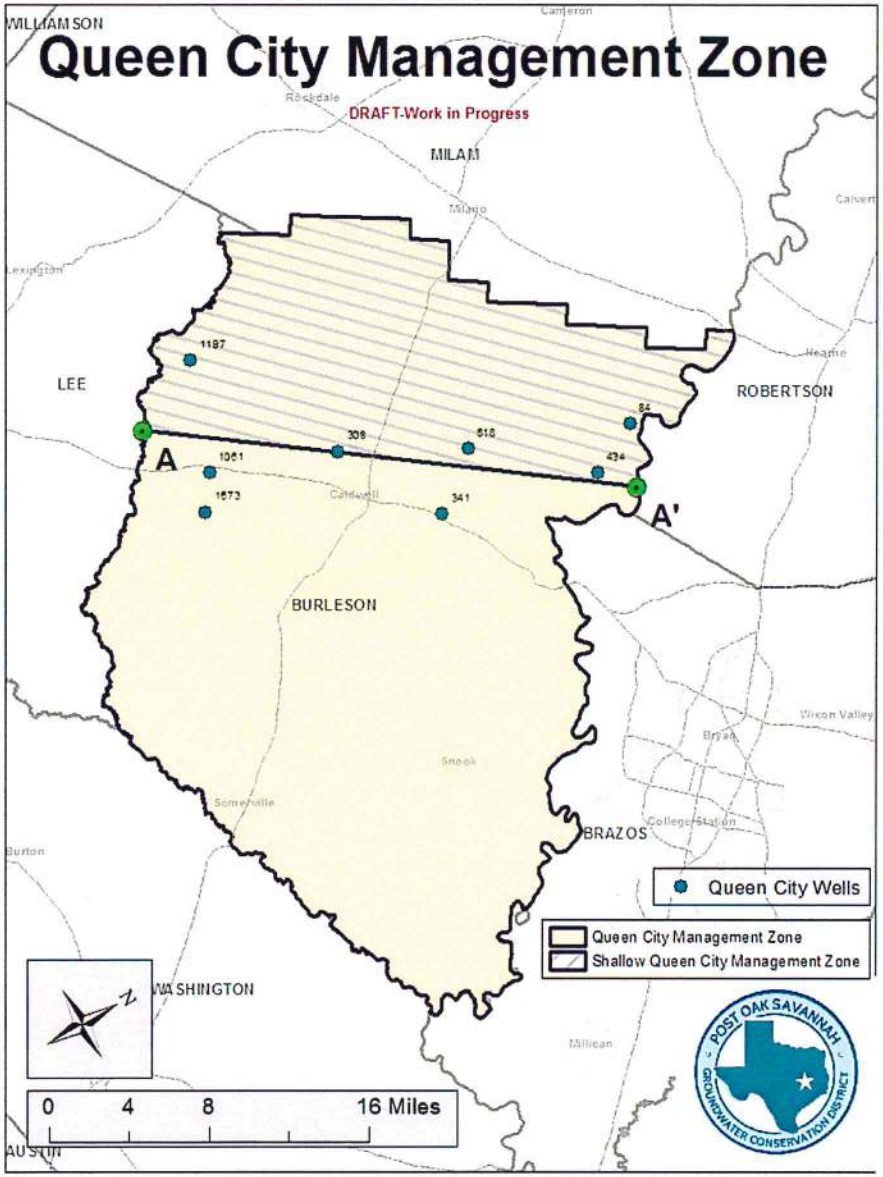
- Well Spacing
- Contiguous Acreage requirements
- Management Zones
- Production limits per acre
- Total permitted
- Permit requirements
- Five year reviews of permits
- DFC Process (GMA and District)
- Thresholds and Monitoring
- ***Requirements of large permit holders to recognize in writing the District's ability to curtail permitting and production
- ***Requirements of recipients of District water to maintain primary/alternative water supplies

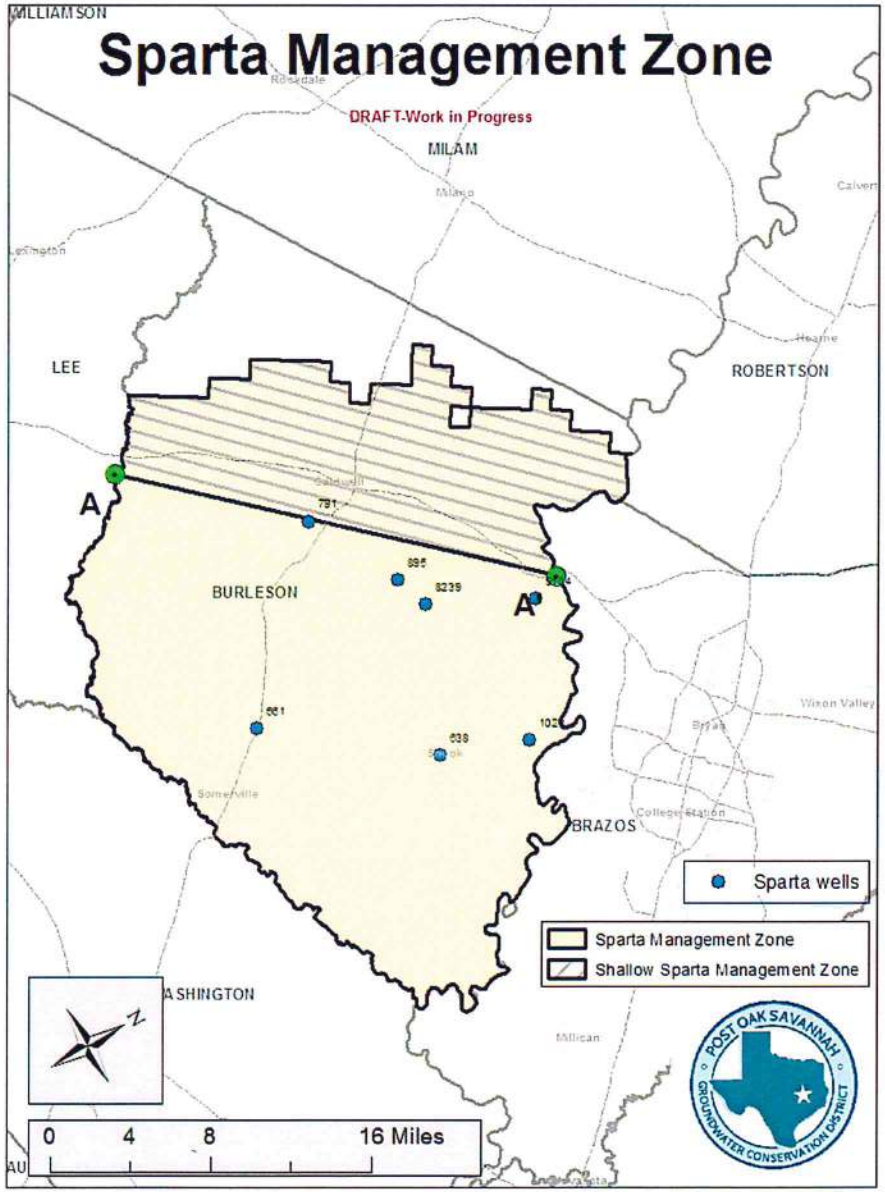

Hooper Management Zone
DRAFT-Work in Progress
WILLIAMSON
FALLS
MILAM
LEE
ROBERTSON
BURLESON
BRAZOS
A
A'
Hooper Wells
Lower Wilcox Management Zone
Shallow Lower Wilcox Management Zone
0 4 8 16 Miles
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT


Simsboro Management Zone
DRAFT-Work in Progress
WILLIAMSON
FALLS
MILAM
LEE
ROBERTSON
BURLESON
A
A'
Simsboro wells
Middle Wilcox Management Zone
Shallow Middle Wilcox Management Zone
0 4 8 16 Miles
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT

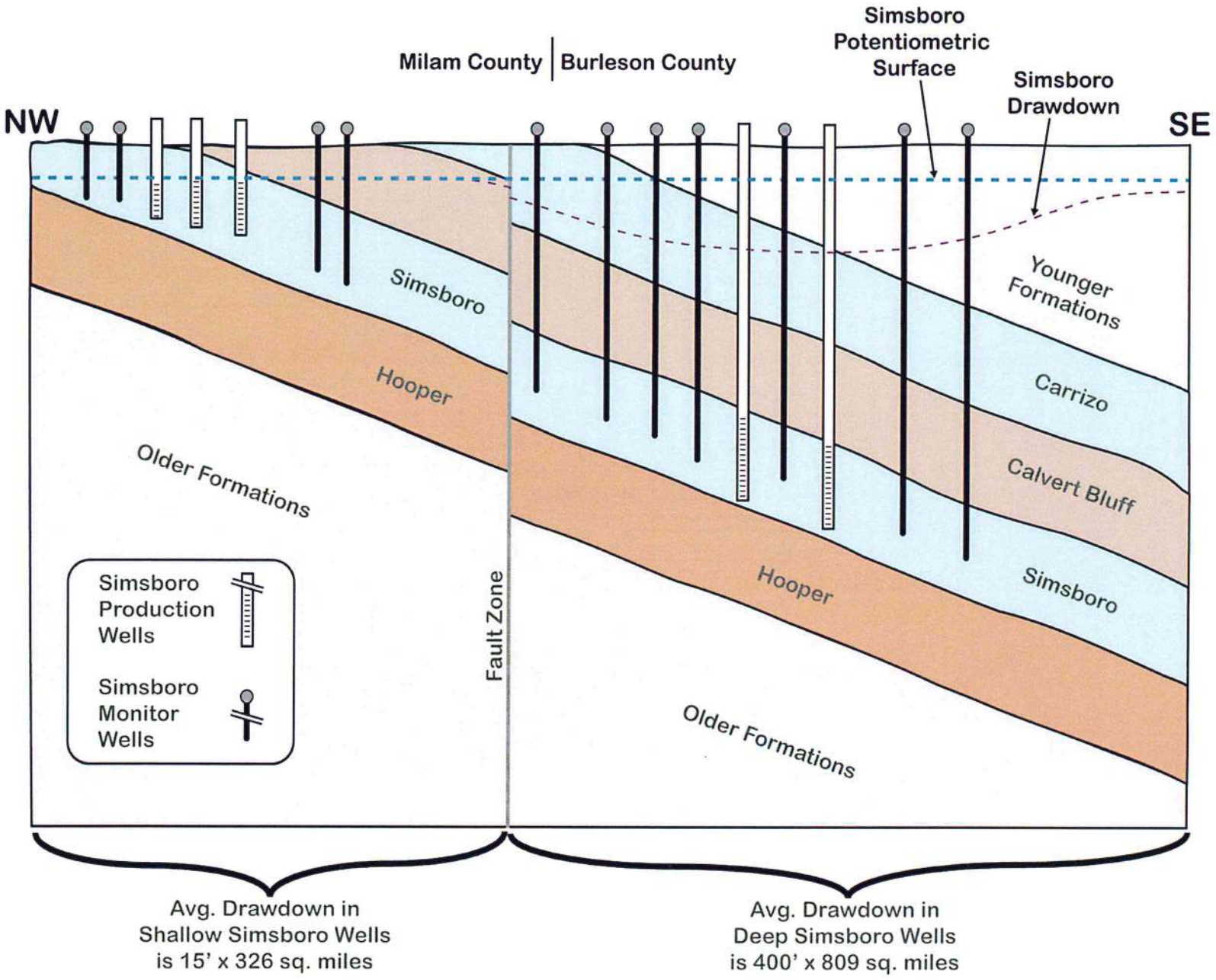

Calvert Bluff Management Zone
DRAFT-Work in Progress
WILLIAMSON
MILAM
FALLS
ROBERTSON
LEE
BURLESON
BRAZOS
WASHINGTON
6305
2152
8451
6243
73
Calvert Bluff Wells
Shallow Upper Wilcox Management Zone
Upper Wilcox Management Zone
0 4 8 16 Miles


Carrizo Management Zone
DRAFT-Work in Progress
WILLIAMSON
MILAM
FALLS
ROBERTSON
LEE
BURLESON
BRAZOS
WASHINGTON
A
A'
99
9167
1066
77
943
1575
433
Carrizo Wells
Carrizo Management Zone
Shallow Carrizo Management Zone
0 4.5 9 18 Miles


Queen City Management Zone
DRAFT-Work in Progress
WILLIAMSON
MILAM
LEE
ROBERTSON
BURLESON
BRAZOS
WASHINGTON
A
A'
1187
1061
1573
308
618
434
84
341
Queen City Wells
Queen City Management Zone
Shallow Queen City Management Zone
0 4 8 16 Miles
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT


Sparta Management Zone
DRAFT-Work in Progress
WILLIAMSON
MILAM
LEE
ROBERTSON
BURLESON
BRAZOS
A
A'
791
895
8239
661
639
Sparta wells
Sparta Management Zone
Shallow Sparta Management Zone
0 4 8 16 Miles
POST OAK SAVANNAH GROUNDWATER CONSERVATION DISTRICT

Schematic Cross Section
Simsboro Drawdown



Summary of POSGCD Management Strategies

Aquifer/Formation	Over all DFC	DFC- Unconfined Area
Sparta	30	10
Queen City	30	10
Carrizo	65	20
Calvert Bluff	140	20
Simsboro	300	20
Hooper	180	20
Yegua/Jackson	100	15

(These DFCs are expressed as average drawdowns for a 60-year period beginning January 2000 and ending December 2059, for the area covered by each aquifer in Milam and Burleson Counties.)

District Education Program

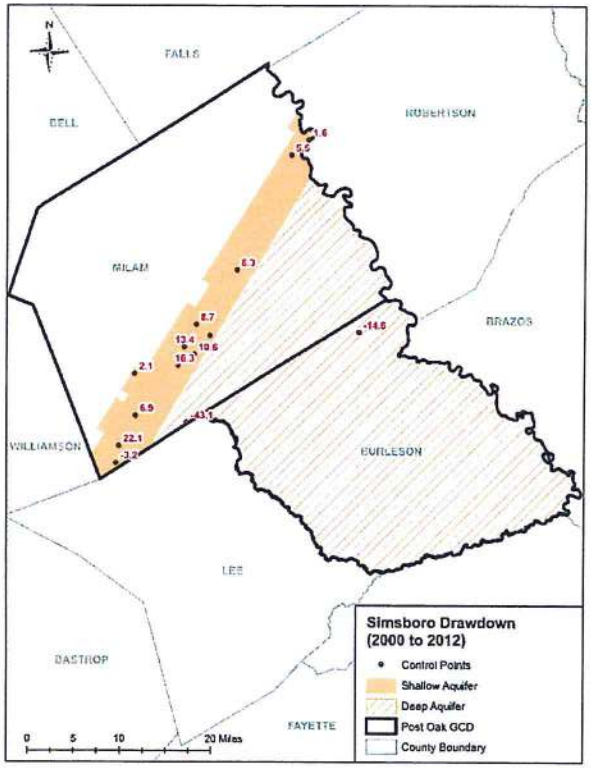
- Public presentations (service clubs, landowners groups, etc.)
- Milam & Burleson Counties Groundwater Summit
- Website- www.posgcd.org
- Schools- Public and private
  - Water Wise- 4th and 5th grades
  - In person presentations- 7th grade science
  - Additional resources- Water IQ for all levels

District Groundwater Conservation Grant Program

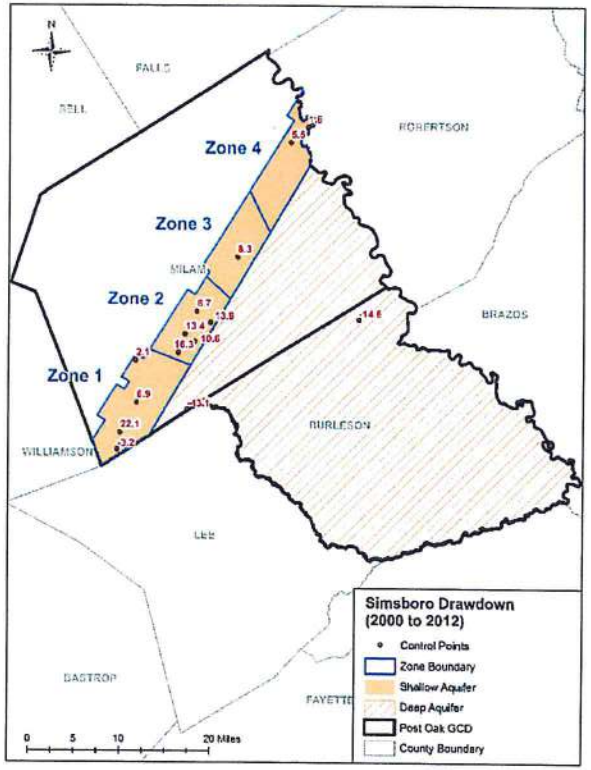
- History (since 2006)
  - Awarded 69 grants
  - All 22 Local Water Utilities have participated
  - Approximately $8.8 Million
  - Annual Budgeted amount of $1 Million
  - Includes funding for Fire Departments

Averaging of Single Points: Simsboro

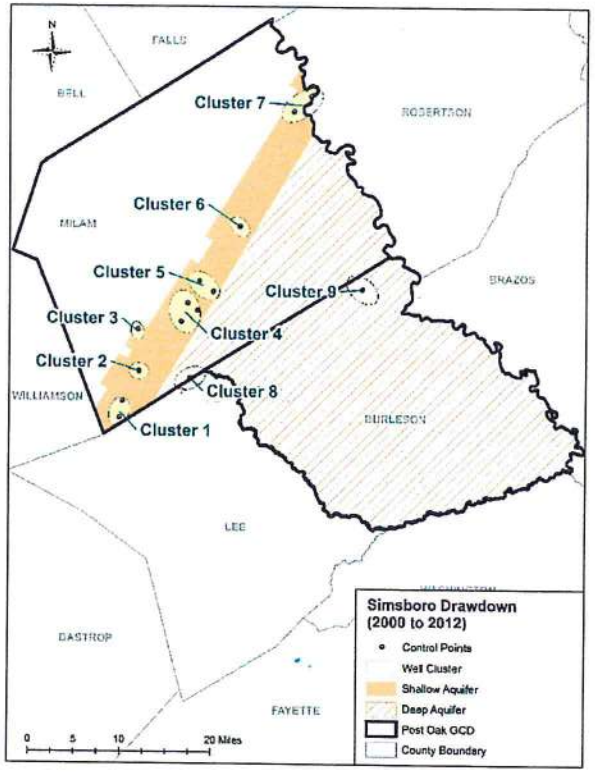
Straight Average
(shallow: 8.9 ft, deep: 3.5 ft)



Four Zones in Shallow
(shallow: 6 ft)



Group by Cluster
(shallow: 8.6 ft, deep: 1.8)



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Comparison Between DFC and Calculated Average Drawdown

Aquifer	Management Zone	Desired Future Condition Average[1]	Number of Wells with Three-year Average				Average Based on Measured Water Levels in Same Wells in POSGCD from 2000 to 2012				Average Based on Interpolated Points		DFC Compliant[4]	Percent of Average Drawdown of DFC[5]
			2000		2012									
			POSGCD	All	POSGCD	All	Number of Wells	Straight Average	Group by Cluster	Four Zones in Shallow	All 2000 Wells and All 2012 Wells	Only Wells Common to 2000 and 2012[2]		
Sparta	Shallow	10	0		0		0	na	na	na	22.2	**3.6**	yes	36.0%
	Entire	30	3	12	6	27	3	4.6	4.6		33.6	**3.5**	yes	11.7%
Queen City	Shallow	10	4		5		4	2.5	3.0	3	12	**3.1**	yes	31.0%
	Entire	30	5	12	9	24	5	2.8	3.2		17.3	**3.1**	yes	10.3%
Carrizo	Shallow	20	0		1		0	na	na	na	7.7	**6.5**	yes	32.5%
	Entire	65	1	7	4	11	1	10.1	10.1		33.9	**6.7**	yes	10.3%
Calvert Bluff (Upper Wilcox)	Shallow	20	8		17		7	9.2	9.1	11.2	-11.1	**0**	yes	0.0%
	Entire	140	11	18	20	33	11	-1.7	-7.5		-6	**-11.4**	yes	-8.1%
Simsboro (Middle Wilcox)	Shallow	20	12		19		12	8.9	7.8	6	12	**9.6**	yes	48.0%
	Entire	300	14	31	29	71	14	3.5	-0.4		20.3	**11.1**	yes	3.7%
Hooper (Lower Wilcox)	Shallow	20	4		9		4	5.9	5.9	5.6	40	**6.2**	yes	31.0%
	Entire	180	5	6	11	25	5	7.4	7.4		84.5	**7.1**	yes	3.9%
Yegua Jackson	Shallow	15	0		0		0	na	na	na	na	**na**	unknown	unknown
	Entire	100	1	9	4	27	1	7.3	7.3		12.3	**16.4**	yes	16.4%
Brazos River Alluvium	Milam	5					0	na					unknown	unknown
	Burleson[3]	6					7	4.5	5.0	5.1			yes	81.1%

[1] all DFCs are from Jan. 2000 to Dec. 2059 except the BRAA DFC, which is from Jan. 2010 to Dec. 2059

[2] best estimate of calculated average drawdown from 2000 to 2012

[3] number of wells from 2010 to 2014

[4] likely is based on review of all available data; insuff. data requires additional information

[5] Threshold Level 1 criteria is 60%

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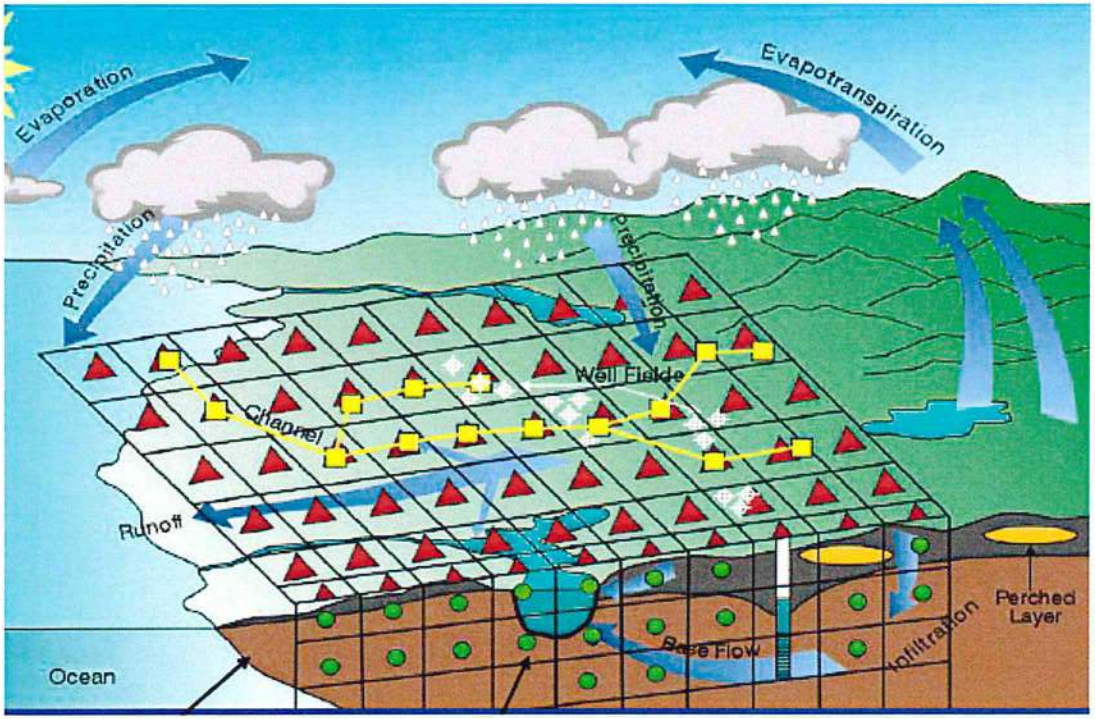
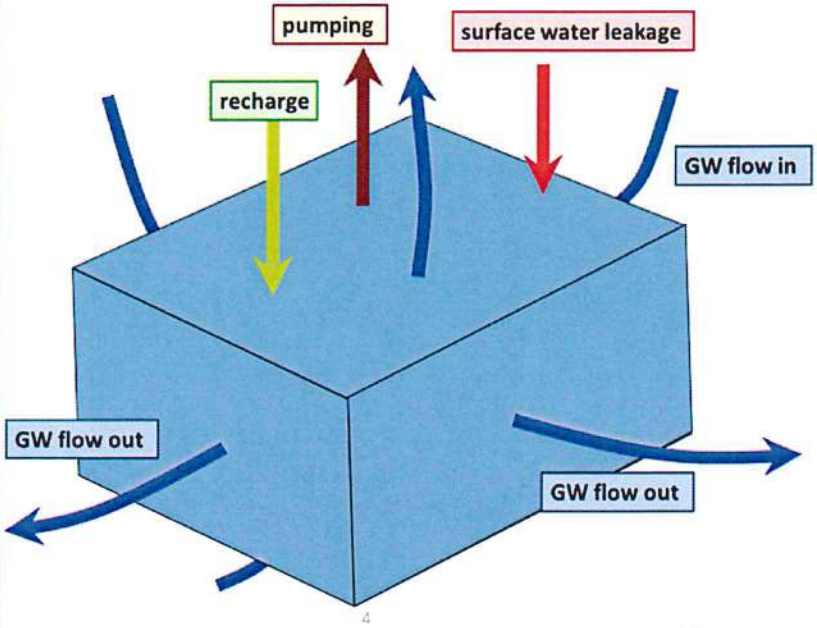
2016 Budget Highlights

1. $1 Million Groundwater Conservation Grants
2. $100 K Groundwater Availability Model Improvement
3. $200 K Additional Hydrology and Monitoring
4. $220 K Office Building Remodel
5. $50 K Education

Description of Groundwater Availability Model

- a tool that integrates data and hydrology to predict groundwater flow
- the tool acts like a big Excel spreadsheet where grid cells physically represent "blocks" of aquifer material
- water levels are predicted by solving for a water balance at each block using equations describing groundwater flow





Note: Schematic from MODHMS MODFLOW Manual

Groundwater Management

- Protection of aquifer water levels
  - Overall Desired Future Conditions
  - Shallow zones restrictions
  - District Monitor well network
  - Management Plan and Rules
- Respect for Property Rights
  - To produce
  - When not producing**

Summary Points

Evidence exists for these statements!

- POSGCD has a Monitoring Network in place for District's Management Zones and is capable of achieving District Management goals
- POSGCD has authority and management plan and rules in place to protect existing wells and users
- POSGCD has authority and management plan and rules in place to protect future wells and users
- POSGCD has authority and management plan and rules in place to protect the groundwater resources in the District in perpetuity – not managed depletion and life of aquifers extended for future generations

Questions?

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