

TEXAS WATER JOURNAL

Volume 4, Number 1
2013



Special Issue: Groundwater

TEXAS WATER JOURNAL

Volume 4, Number 1

2013

ISSN 2160-5319

texaswaterjournal.org

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Cover photo: An artesian well, belonging to catfish farmer Ronnie Pucek, in the Edwards Aquifer in 1993. © Peter Essick

Groundwater Conservation District Finance in Texas: Results of a Preliminary Study

Charles Porter^{1,2}

Abstract: The preferred method of groundwater management in Texas is by locally formed groundwater conservation districts (GCDs). However, not all of Texas groundwater is managed by a district; some areas have not voted to form a GCD. There are 99 GCDs in Texas with 2 pending; only 174 of the 254 counties are covered by a GCD. GCDs are financed by ad valorem taxes, fees, and grants. Not all GCDs have ad valorem tax support. Revenues from the responding GCDs in this study range from \$20,000 annually to \$2,632,982. Some cannot open their offices daily. All need money for research to determine the actual amount of groundwater in their district, its sources, and its characteristics. Tax rates for the GCDs with ad valorem tax authority in this study run from \$.005/\$100 valuation to \$.035/\$100 valuation, meaning a \$200,000 home in these districts would pay from \$10 to \$70 annually, not as much as a few cups of Starbucks coffee cost annually. All Texans agree water is life and groundwater is one of our most precious resources, therefore GCDs deserve more financial resources. The Texas Water Code provides a number of tools for GCDs to finance their operations including ad valorem taxation levies, issuance of bonds, notes, and promulgation of fees to name a few. However, in many of the GCDs who responded to the study, these tools are not practical to use. Since ad valorem taxation and bond authority must be granted by local voter approval, these tools are unavailable in some GCDs as well.

Keywords: groundwater management, groundwater conservation district finance

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² I was assisted by my summer intern at St. Edward's University, Emily Caudill, in compiling the charts and data. I greatly appreciate her able assistance.

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Terms used in paper

Short name or acronym	Descriptive name
DFC(s)	desired future condition(s)
GCD(s)	groundwater conservation district(s)
GMA(s)	groundwater management area(s)
MAG	managed (or modeled) available groundwater
PGMAs	priority groundwater management areas
TWDB	Texas Water Development Board
TCEQ	Texas Commission on Environmental Quality

Groundwater conservation districts (GCDs) manage a large portion of the groundwater produced in Texas though not all; some areas are not covered by a GCD.¹ The Texas Legislature has asserted on a recurring basis that it prefers groundwater be managed by GCDs.² Yet of the 35 voluntary GCD respondents to this brief study, only High Plains Underground Water Conservation District No. 1 (\$2,632,982)³, Barton Springs/Edwards Aquifer GCD (\$1,420,170)⁴, and Upper Trinity GCD (\$1,337,750)⁵ had annual gross revenue greater than the average Starbucks coffee shop (\$1,078,000); only High Plains had more revenue than the average McDonald's (\$2,565,000)⁶ or even The Finish Line, a tennis shoe shop located in many malls (\$1,807,548)⁷. Of the GCDs that responded to this preliminary study with ad valorem tax support, in 14 of the 35 participants, the highest tax rate reported was \$.035/\$100 valuation⁸ meaning the tax paid annually for the local GCD on an individual property valued at \$200,000 is only \$70, for many, not even the cost of 1 tank of gasoline, 2 cups of Starbucks coffee a month for a year, or 2 bags of groceries. Not all of Texas is covered by a GCD; the groundwater in only 174 of the state's 254 counties is managed.⁹ The future success in Texas is directly linked to groundwater resources—of that, few disagree. No one disagrees either that water is life.

To date the citizens of Texas, however, seem reluctant to adequately finance the costs of the preferred management method of groundwater, that is GCDs. The Legislature is responsible for setting up the process to fund GCDs. Texas citizens do not set the budgets for state agencies and, other than the ballot box, have less than timely and, at best, indirect control over political subdivision revenues from ad valorem taxes and fee structures. GCDs have the opportunity, with the consent of their local voters, to become ad valorem tax-based entities. However the Legislature, by requiring

these local confirmation elections, have made it a difficult challenge for GCDs to generate revenue as ad valorem tax-based entities.

GCD LOCATIONS AND BASIC STATISTICS

The map in Figure 1 depicts the locations of the individual Texas GCDs. The areas in white have no GCD at this time.

The Texas Water Development Board (TWDB) offers these facts about GCDs in Texas:

- There are 99 GCDs in Texas: 97 are confirmed by voters (note: this estimate includes several districts that do not require confirmation) and 2 have yet to be confirmed by voters through local elections.
- The first district (High Plains Underground Water Conservation District No. 1) was created in the Texas Panhandle in 1951.
- The smallest district covers an area of about 31 square miles (Red Sands Groundwater Conservation District in Hidalgo County) and the largest district (High Plains Underground Water Conservation District No. 1) covers an area of approximately 12,000 square miles.
- A total of 174 counties are either fully or partially within a GCD.
- There are 62 single-county districts in Texas and 37 that cover more than 1 county.
- While 96 of the 99 existing districts overlie a major aquifer, only 64 of these districts overlie a minor aquifer.
- The total reported groundwater usage in the entire state in the year 2008 was approximately 9.7 million acre-feet.
- In the same year, the total reported groundwater usage in all the districts (confirmed and unconfirmed) in the state was approximately 8.3 million acre-feet.
- Districts over the Ogallala Aquifer accounted for approximately 5.6 million acre-feet of this usage.
- In 2008, Throckmorton County had the lowest amount of reported groundwater usage (28 acre-feet) and Hale County the highest (540,886 acre-feet).
- The first groundwater management plan to be approved was the Gonzales County Underground Water Conservation District's plan in 1998.

Texas GCDs are almost infinitely variable; drawing “across-the-board” conclusions about them can be problematic. The same is true for water wells in Texas—their use, depth, and production volume varies widely. The TWDB maintains an inventoried database of 135,000 water wells in Texas. Ac-

¹ According to the Texas Water Development Board (TWDB) currently 174 of Texas' 254 counties are covered or partially covered by a GCD.

² Texas Water Code 36.0015. The Texas Supreme Court has also emphasized the importance of GCDs, most recently in the opinion by Justice Nathan Hecht in *The Edwards Aquifer Authority and the State of Texas, Petitioners, v. Burrell Day and Joel McDaniel*, Respondents, in the Supreme Court of Texas No. 08-0964.

³ Appendix 1 to this article.

⁴ Ibid.

⁵ Ibid.

⁶ <http://www.retailsails.com>.

⁷ The Finish Line Annual Report 2012 Annual Report, 16.

⁸ Appendix 1. The maximum tax rate allowed by statute is \$.50 per \$100 valuation.

⁹ http://www.twdb.state.tx.us/groundwater/conservation_districts/facts.asp

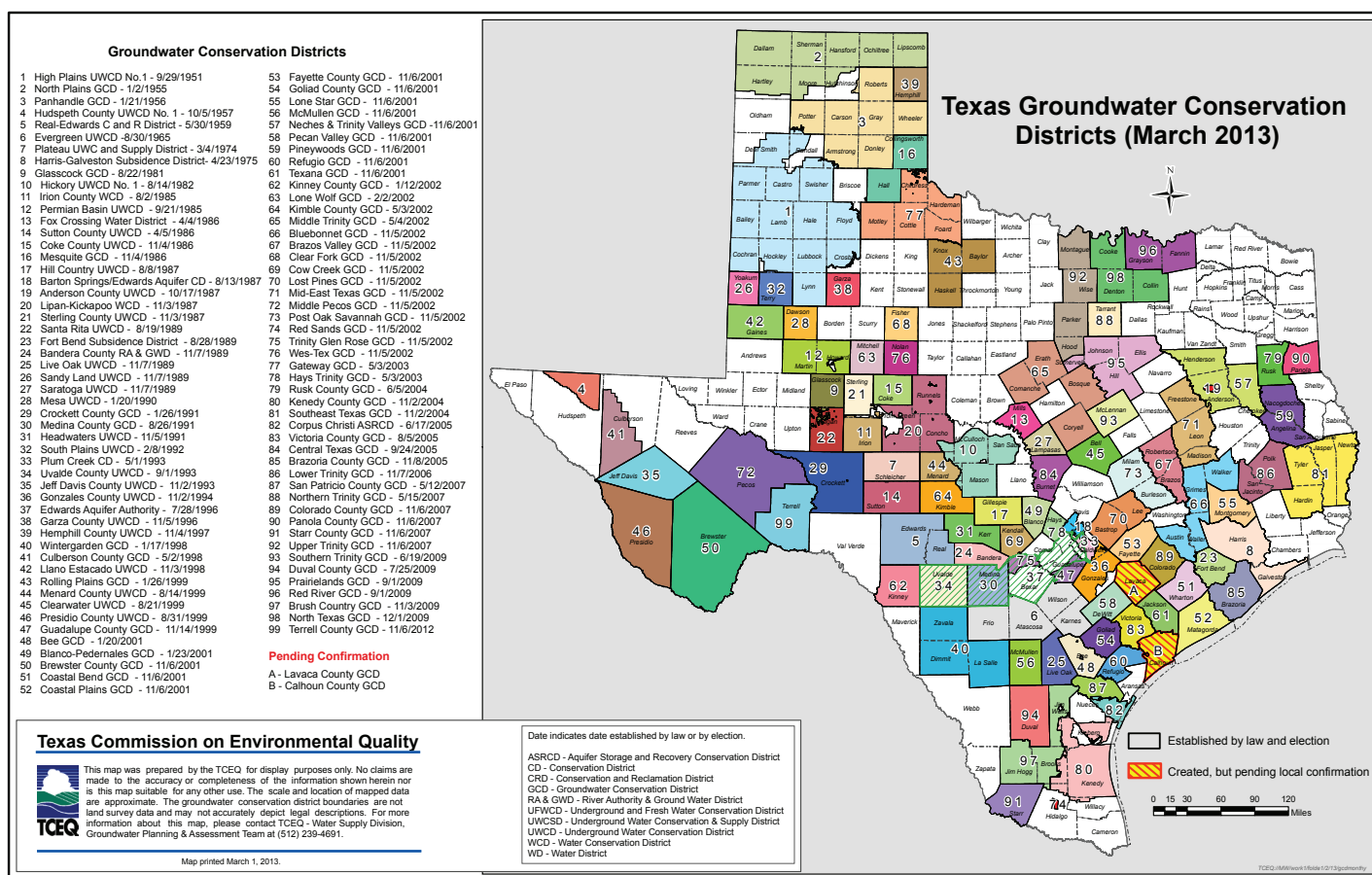


Figure 1. March, 2013 Map of Groundwater Conservation Districts.

according to the TWDB, “This database, thanks in part to the cooperation from private well owners and public agencies, is one of the most comprehensive statewide groundwater databases in the entire United States.”¹⁰ The database certainly does not include all the water wells in Texas, yet by its sheer size it indicates the critical role groundwater plays in the everyday lives of Texans.¹¹ We simply fail to put our money

¹⁰ <http://www.twdb.state.tx.us/groundwater/data/>; for a county-by-county compilation of water wells, see <http://www.twdb.state.tx.us/groundwater/data/gwdbprpt.asp>. Other substantial well data can be found at the Texas Department of Licensing and Regulation, The Railroad Commission of Texas, and at the United States Geological Service Texas Water Science Center in San Antonio.

¹¹ Many domestic and livestock wells are not required to be registered anywhere. The TWDB is required by statute to estimate all exempt use. The TWDB defined its methodology for accounting exempt use in this statement found on page 4 of “GAM Run 10-050 MAG” February 1, 2011: “Since exempt uses are not available for permitting, it is necessary to account for them when determining managed [now referred to as modeled] available groundwater. To do this, the TWDB developed a standardized method for estimating exempt use for domestic and livestock wells in the area. Because other exempt uses can vary significantly from

where no doubt we would all agree our treasure is—into the support of prudent water management and conservation.

BASIC SOURCES OF GCD REVENUE

While there are 3 basic sources of revenue for GCDs: local ad valorem taxes, permit and other fees, and grants, there is a wide variation in revenues across the 35 GCDs that responded to the questionnaire.¹² As mentioned, the study respon-

district to district and there is much higher uncertainty associated with estimating use due to oil and gas exploration, estimates exempt pumping outside domestic and livestock uses have not been included. If the district believes it has a more appropriate estimate of exempt pumping, it may submit it, along with a description of how it was developed, to the TWDB for consideration. Once established, the estimates of exempt pumping are subtracted from the total pumping output from the groundwater availability model to yield the estimated managed [now referred to as modeled] available groundwater for permitting purposes.”

¹² There are 97 GCDs currently; 77 were selected for our questionnaire (the members of the Texas Alliance of Groundwater Districts).

dents had annual revenues that ranged from \$20,000 to \$2,632,982.¹³ Some respondents have hundreds of permitted irrigation wells; others such as the Crockett County Groundwater District have only 3.¹⁴ Though a GCD has a small amount of revenue, that does not necessarily indicate a need for more funding. Some GCDs do not have much demand for non-exempt water wells—irrigation, municipal, or industrial use wells—hence, due to lack of demand, the impact of any production, user, or export fees would be insignificant. Many district water wells drilled are only used for and classified as domestic and livestock wells, which are generally exempt from permit.¹⁵ Some GCDs are located in oil and gas shale boom areas where hydraulic fracturing is using millions of gallons of groundwater to extract the oil and gas. This use of groundwater is also exempt from permit during exploration activities, but during production, it requires a permit.¹⁶ According to The Railroad Commission of Texas¹⁷:

The amount of water needed to perform hydraulic fracturing on a well is highly variable and depends on the formation that is undergoing hydraulic fracturing and whether the well being fractured is a vertical well or a horizontal well.

In the Barnett Shale, hydraulic fracturing of a vertical well completion can use 1.2 million gallons (28,000 barrels) of water, while the fracturing of a horizontal well completion can use 3.5 million gallons (over 83,000 barrels) of water.

In the Eagle Ford Shale, industry has reported an average use of approximately 11 acre-feet of water used

to complete each well, down from the approximately 15 acre-feet previously used.

The amount of water used in hydraulic fracturing is relatively small when compared to other water uses such as agriculture, manufacturing and municipal water supply.

According to the TWDB, irrigation accounts for the largest share of the state's total current water demand, roughly 60 percent, and projected water needs are expected to increase most in the area of municipal water use in the coming decades. In comparison, hydraulic fracturing and total mining water use continue to represent less than one percent of statewide water use, although percentages can be larger in some localized areas.

Before going into a detailed commentary about the results of the study, an overview of GCD characteristics and current issues is helpful.

THE NEED FOR GCDs; RISK IN AREAS WITHOUT GCDs

According to Kirk Holland, general manager of the Barton Springs-Edwards Aquifer Groundwater Conservation District, “every square inch of ground in Texas should be in a groundwater conservation district.”¹⁸ In the areas where no GCD exists, there is no management or protection of groundwater. Some cities and counties regulate groundwater use and some “home-rule” cities exercise their police power to regulate groundwater well drilling and production. Without a GCD, landowners risk a loss of their groundwater, not only to adjacent landowners with the same rights for local use but also to those who would transfer large amounts of groundwater to other areas of the state. This fact should cause a great deal of alarm and consternation for people living in those unprotected areas. For example, 1 area without a GCD is Val Verde County, the home county of the City of Del Rio. Del Rio was warned by its own consulting engineer of the city's impending risks in not being covered by a GCD due to the concept of the “rule of capture” in Texas groundwater law.¹⁹ The local people personally interviewed believe creation

¹³ See Appendix 1. The Texas State Auditor is a source for further information about revenue sources of GCDs. For the purposes of this preliminary study, I used only voluntary respondents' information.

¹⁴ Interview with Slate Williams, general manager of the Crockett County Groundwater Conservation District in Ozona, Texas July 17, 2012.

¹⁵ The typical domestic and livestock well does not have to be permitted as long as it is incapable of producing more than 25,000 gallons per day on a 10-acre tract. 25,000 gallons per day is the equivalent of 336 inches of rain a year (1 inch of rain per acre equals 27,154 gallons of water), the equivalent to a very wet rainforest. While it is unimaginable that someone would use that much water in a beneficial way, since there is no permit required, no meter required, and no accounting of the amount of water drawn for most domestic and livestock wells meeting the exempt rules, we simply do not know how much water exempt domestic and livestock wells are using across the state or in any GCD. Most GCDs now at least require registration of domestic and livestock wells, generally for statistical purposes only. How well this is enforced is unknown. The question is not so much the number of wells drilled in the past few years, but the wells that were drilled in the recent past or prior to the formation of the local GCD.

¹⁶ The Texas Water Code 36.111 requires those fracturing to report their groundwater use if required by local GCD rule.

¹⁷ <http://www.rrc.state.tx.us/about/faqs/hydraulicfracturing.php>

¹⁸ Phone interview with Kirk Holland, January 4, 2012.

¹⁹ Charles Porter. “The History of *W.A. East v. Houston and Texas Central Railway Company, 1904*: Establishment of the Rule of Capture in Texas Water Law or “He Who Has the Biggest Pump Gets the Water.” *East Texas Historical Journal*, 50th Anniversary Edition, Fall, 2012. The rule of capture declared there is no liability for 1 neighbor's water well taking enough water to deplete a neighbor's water well. It has been confirmed for more than 100 years by all the Texas courts, including the Texas Supreme Court. In areas without a GCD, the rule of capture can be a formidable threat to the future of the area's groundwater.

of a GCD in their area by local election is not probable in the near future—maybe ever.²⁰ Groundwater is owned in place according to the ruling of the Texas Supreme Court in the Day case²¹; however determining precisely the amount of groundwater owned is very difficult and expensive as groundwater is “fugitive” in nature or moving constantly from place to place.

An example of a different anomaly in groundwater management in Texas with potentially negative consequences on both the aquifer and public attitude towards conservation is the City of Austin. Austin’s groundwater north of the Colorado River is not covered by a GCD. The imposition of watering restrictions during drought and the increasingly high cost of lawn irrigation have spurred the installation of more than 200 private water wells within the city’s service area since 2006, with essentially no restrictions on their spacing or the amount of water produced by each, in an area already adequately served by centralized water supplies.²² The impact on the aquifer of these new wells and their interference with each other, especially during prolonged drought, are unknown at this time. The sense of a reduced need for conservation among those generally well-heeled private well owners and the inequity perceived by other landowners without such wells make sorely needed water conservation, regardless of water source, more difficult and of concern to water managers.

Garrett Hardin, an ecologist, wrote in the “The Tragedy of the Commons” about the depletion of a shared resource by individuals, acting independently and rationally according to each one’s self-interest, despite their understanding that depleting the common resource is contrary to the group’s long-term best interests.²³ Groundwater in Texas is one of our most precious common resources. The tension maintaining the delicate balance between the common good and personal interest is building in Texas especially due to the serious prospect of extended drought in our future, yet again.

²⁰ Interview with Bill Nixon an ex Del Rio City Councilman, in Del Rio, July 27, 2010. Their family has the oldest and largest ranch inside the city limits dating to just after the Civil War.

²¹ The Edwards Aquifer Authority and the State of Texas, Petitioners, v. Burrell Day and Joel McDaniel, Respondents, in the Supreme Court of Texas No. 08-0964.

²² Austin American-Statesman. “Drought spurs more to drill private wells” June 3, 2012, front page. It is estimated there were 156 private water wells in the City of Austin at that time; latest estimates exceed 200. The City of Austin passed Ordinance 20121011-005 on October 11, 2012. In this ordinance, the City has authority to require registration of private water wells along with other authority to avoid water quality impairment. However, there is no limitation as to the amount of water drawn other than the court ruled limitations on the “rule of capture.”

²³ Hardin, G. (1968). “The Tragedy of the Commons”. *Science* 162 (3859): 1243–1248

HOW GROUNDWATER CONSERVATION DISTRICTS ARE CREATED

The Groundwater Conservation District Act of 1949 provided for conservation and development of groundwater with GCDs as managers.²⁴ In 1951, the High Plains Underground Water Conservation District No. 1 became the first GCD created in Texas. Chapters 35 and 36 of the Texas Water Code describe the specific legal authority granted GCDs relating to the management of groundwater and the administrative governance and oversight of GCDs by state agencies. The TWDB administrative rules review the desired future conditions (DFCs) of the groundwater management areas (GMAs). Member GCDs propose DFCs working through their GMA but do not have the authority to change the GMA-determined DFCs at the GCD level. The Texas Commission on Environmental Quality (TCEQ) also has limited oversight over GCDs under the Texas Water Code. GCDs are political subdivisions in Texas and as such, they are additionally obligated to abide by all state laws relating to political subdivisions, including laws related to open government and public information, ethics, and voting.

There are currently 99 GCDs covering all or part of 174 counties.²⁵ There are also 2 unconfirmed GCDs that have full statutory authority to regulate although confirmation will be required to keep those powers. These GCDs have broad statutory authority but their activities remain ultimately under the electorate’s supervision. Each district presides over a territory described at its creation. GCDs strive to protect property owners’ rights while at the same time preserving groundwater resources. Landowners may petition to create a GCD or petition an existing GCD for annexation of their land. Generally voters approve the formation of the district and elect the governing board of directors, but in some areas, county commissioners appoint the board of directors. All GCDs must develop a groundwater management plan every 5 years to address water supply needs, management goals, and estimates of water usage. The GCD submits the plan to the TWDB for administrative approval and implementation of the plan is subject to review by the State Auditor’s Office. Since 2005, all GCDs participate in joint planning within GMAs.

Authority Granted to GCDs

According to Chapter 36 of the Texas Water Code, “[GCDs] created as provided by this chapter are the state’s

²⁴ See also The Texas Constitution Article XVI, section 59.

²⁵ www.twdb.state.tx.us/mapping/doc/maps/gcd_only_8x11.pdf, as of March, 2013.

preferred method of groundwater management through rules developed, adopted, and promulgated by a district in accordance with the provisions of this chapter.”²⁶ Section 36.113 provides that GCDs must “require a permit for the drilling, equipping, operating, or completing of wells or for substantially altering the size of wells or well pumps.”²⁷ When acting on permit applications, a district must consider whether “the proposed use of water unreasonably affects existing groundwater and surface water resources or existing permit holders,” whether “the proposed use of water is consistent with the district’s approved management plan,” and whether “the proposed use of water is dedicated to any beneficial use.”²⁸ GCDs formulate and are guided by groundwater management plans that:

- provide for the most efficient use of groundwater,
- control and prevent waste of groundwater,
- control and prevent subsidence,
- address conjunctive surface water issues,
- address natural resource issues,
- address drought conditions, and
- address conservation.

The rules of most GCDs include the registration of all water wells, even those exempted from permitting by the Texas Water Code. The basic exemptions²⁹ are 1) domestic and livestock use of water from a well on tracts larger than 10 acres and that is capable of producing no more than 25,000 gallons per day³⁰ and 2) water wells used in oil and gas exploration (excluding production)³¹.

Section 36.116 (a) of the Texas Water Code further outlines the broad regulatory authority of GCDs. Here is an outline of their authority:

In order to minimize as far as practicable the drawdown of the water table or the reduction of artesian pressure, to control subsidence, to prevent interference between wells, to

prevent degradation of water quality, or to prevent waste, a district may regulate:

- (1) the spacing of water wells by:
 - (A) requiring all water wells to be spaced a certain distance from property or adjoining wells;
 - (B) requiring wells with a certain production capacity, pump size, or other characteristic related to the construction or operation of and production from a well to be spaced a certain distance from property lines or adjoining wells; or
 - (C) imposing spacing requirements adopted by the board; and
- (2) the production of groundwater by:
 - (A) setting production limits on wells;
 - (B) limiting the amount of water produced based on acreage or tract size;
 - (C) limiting the amount of water that may be produced from a defined number of acres assigned to an authorized well site;
 - (D) limiting the maximum amount of water that may be produced on the basis of acre-feet per acre or gallons per minute per well site per acre;
 - (E) managed depletion; or
 - (F) any combination of the methods listed above in Paragraphs (A) through (E).³²

VOLUNTARY METERING OF WATER WELLS

The Texas Water Code allows GCDs to consider how granting new permits will affect existing permit holders and surface water resources. The rights of historical users may be protected in considering permitting of new users. Since there is a real possibility that drought or other scarcity may force GCDs and other Texas agencies to enact increased limitations on groundwater withdrawals, it may be wise policy for landowners to meter all their wells and document the amount of water used historically. I have discussed the idea of metering exempt domestic and livestock wells and all wells in areas without a GCD with many farmers and ranchers across Texas in the last 2 years. While I meet resistance to the idea of metering at first, many of my interviewees understand the value of a meter and good recordkeeping to someday prove their historic use.

CONTROVERSIAL RULES

The most controversial GCD rules involve restrictions on withdrawals. Historically, districts have sought to protect

²⁶ Texas Water Code 36.0015.

²⁷ Ibid. 36.113.

²⁸ Ibid.

²⁹ Note that there are exemptions to the exemptions also but are outside the scope of this paper.

³⁰ The domestic and livestock exemption is set by the individual GCDs and varies across the state. The specification provided by the statute is a minimum standard for exemption.

³¹ There is discussion underway in the field about oil and gas exemptions for fracturing older wells or reworked wells and exempt status. Some GCD managers I talked to expressed concern over what activity constitutes exploration and what is production. Recently private landowners are selling water to oil and gas drillers through “private water stations.” The water wells supplying these water stations are not exempt under the Texas Water Code 36.117.

³² Texas Water Code 36.116 (a).

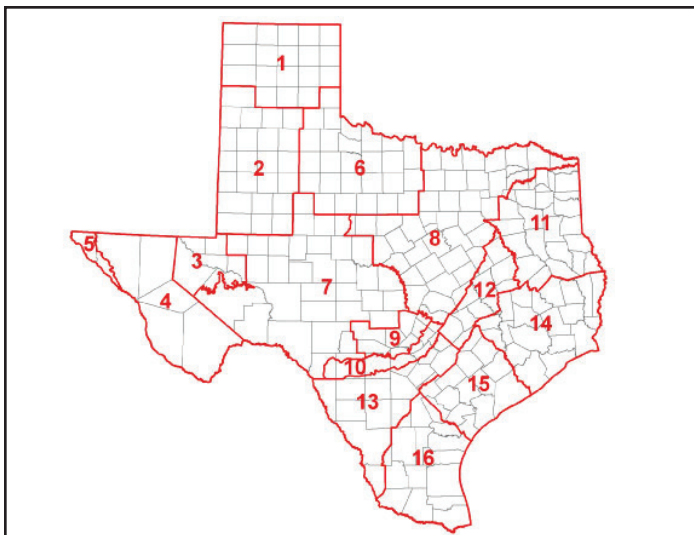


Figure 2. Groundwater Management Areas (GMAs).

groundwater by regulating the spacing of wells, limiting the rate of pumping, limiting the amount of pumping each year, or a combination of these measures. There are high limits to the fines associated with violation of GCD rules, up to \$10,000 per day for each violation. Those neighbors who own land adjacent to a well in violation of GCD rules may sue the well owner for damages to stop the violation and to recover damages.³³ Outside a GCD, the chances of a successful lawsuit such as this are exceedingly slim, as the rule of capture prevails.

Can GCDs generally prohibit landowners from access to water under their own land? GCDs are barred from prohibiting landowners from drilling wells that meet exempt criteria. GCDs, however, can regulate amounts of water withdrawn for municipal, industrial, and agricultural irrigation use. GCDs often regulate spacing between wells. Will most districts eventually require meters on existing wells? Considering the forecasts for Texas growth and future droughts, it may be a prudent practice of GCDs to require meters on all wells since more accurately determining the actual amounts of groundwater used protects not only the resource but all users in the district. Metering also greatly helps the science of groundwater since accurate pumping numbers are needed to have accurate models.

³³ See Texas Water Code 36.119 and particularly 36.119(g) for preconditions for filing this type of lawsuit.

GROUNDWATER MANAGEMENT AREAS AND DESIRED FUTURE CONDITIONS

The GMAs are shown in Figure 2. The logic behind their formation was simple. Since many of the 99 GCDs are defined more or less by county boundaries and many share the same aquifer and underground water sources, the GMAs give long-term water planners a chance to consider on a more regional basis the impact the GCDs have in total over an aquifer or underground water source. Section 35.004 (a) of the Texas Water Code provides that, “to the extent feasible, the groundwater management area shall coincide with the boundaries of a groundwater reservoir or a subdivision of a groundwater reservoir.” According to the TWDB, “Section 35.004 provides that the TWDB may alter the boundaries of designated management areas as required by future conditions and as justified by factual data.”³⁴

As required by statutes adopted between 2005 and 2010, the GCD members of the GMAs used a defined joint planning process to develop DFCs for their aquifers and delivered them to the TWDB. According to a memorandum to TWDB board members dated September 9, 2009, “a desired future condition is essentially a management goal that defines the philosophy and policy of groundwater management in a defined area.”³⁵ In other words, DFCs are a policy statement of what the GMAs would like their groundwater conditions to be in 50 years, so each of its member GCDs can begin to establish its own mandatory groundwater management objectives. To establish the DFC for the GMA, the member districts must adopt their DFCs by at least a two-thirds majority vote. The DFCs are submitted to the TWDB for review; the TWDB can recommend changes³⁶ but not mandate the districts or GMAs to make the changes. (I have heard some attorneys recently speak of a movement to give the TWDB the authority to force its recommended changes. However, both the TWDB and the Sunset Commission recommended the opposite; they recommended removing the TWDB from the process except for technical assistance.)

DFCs may be revised at any time and must be updated at least every 5 years. After the DFCs are generated, each GMA presents its decision in local hearings for the second round³⁷

³⁴ Letter to Board Members, December 7, 2011, RE: Proposed Amendment to 31 Tex. Administrative Code Chapter 356 Groundwater Management. See Texas Water Code 35.004.

³⁵ For further detail, please refer to the Texas Water Code 36.001 and 36.108.

³⁶ The TWDB only has this ability if a petition challenging the reasonableness of the DFC is filed and only then if the board finds the DFC not reasonable.

³⁷ The process changed during the 82nd Legislative session. The first round hearing is no longer required.

to receive public comments. A few of these hearings have been thorny, as members of the public have disagreed with the DFCs in some areas. The public has the right to administrative appeal.

DFCs are critical for planning in each GCD. GMA were created for the same reason as the answer to my favorite question for my water classes, “What does water ignore?” The correct answer is, “Political boundaries.” Yet, political boundaries were a significant basis for setting GMA boundaries; some say more so than outlining the pool of groundwater in the overall area. The GMAs were formed to help generate groundwater policies considering shared groundwater sources among the GCDs.

MOST RECENT LEGISLATION

SB 660 was passed by the 82nd Texas Legislature, which added a definition for DFCs to Chapter 36 and now requires districts to ensure that management plan goals and objectives are consistent with achieving applicable DFCs. The bill added 9 new factors that districts must consider when renewing or establishing DFCs:

1. Aquifer uses or conditions within the management area, including conditions that differ substantially from 1 geographic area to another
2. The water supply needs and water management strategies included in the state water plan
3. Hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge
4. Other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water
5. The impact on subsidence
6. Socioeconomic impacts reasonably expected to occur
7. The impact on the interests and rights in private property, including ownership and the rights of landowners and their lessees, and assigns in groundwater
8. The feasibility of achieving the DFC
9. Any other information relevant to the specific DFCs

Pursuant to the act, DFCs must also “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.”³⁸

In addition to GMAs, Texas has currently designated 6 priority groundwater management areas (PGMAs). These are areas in which critical issues associated with quantity or

quality of groundwater either already are occurring or may reasonably be expected to occur in the next 50 years.³⁹ For areas not covered by GCD protections inside any of these PGMAs, if the local population has not created a GCD on its own, the TCEQ has an obligation to create one even without local voters’ approval, although any new tax rate associated with the new GCD must be voter-approved.⁴⁰ Counties in PGMAs and all other counties in Texas may “impose groundwater availability requirements on new developments dependent on groundwater.”

MODELED AVAILABLE GROUNDWATER

After the GMAs delivered the DFCs to the TWDB, the board generated the then termed managed available groundwater (MAG) reports for each DFC on the basis of groundwater models and the best science available. In 2011, under SB 737 of the 82nd Legislature, the term managed available groundwater was changed to modeled available groundwater, and its definition modified for clarity.⁴¹ A MAG is now defined as “the amount of water that the [TWDB] executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under [the joint planning process of] Section 36.108.”⁴² The MAG includes water produced from both exempt and non-exempt wells. The TWDB then apportions the MAG among the individual districts and also as warranted among the relevant regional water planning areas.

³⁹ Originally the PGMAs were based on a shorter time period. The 50-year time period changed in the 82nd Legislative session.

⁴⁰ The TCEQ has an “out” in the statute if it believes a GCD would not be viable.

⁴¹ Since the groundwater model parameters are so critical to prudent planning of groundwater and the consequences of unrealistic models is significant, it is my opinion that the change in name is appropriate. Planning based on modeling is only as good as the model parameters. The Texas Alliance of Groundwater Districts published these comments about legislative changes made by the 82nd Legislature in 2011: “SB 660 also requires Regional Water Plans (RWP) to be consistent with applicable desired future conditions (DFCs) and adds additional informational requirements for the state water plan. Notably, the bill requires TWDB and the TCEQ, in consultation with the Water Conservation Advisory Council (WCAC), to develop a uniform water use calculation system. These changes are consistent with the changes made by SB 181. Consistent with SB 737, SB 660 changes the term “managed available groundwater” to “modeled available groundwater” in order to better reflect the meaning of the term. SB 660 also makes comprehensive changes to the process for establishing and adopting DFCs in the various GMAs and filing petitions for inquiry at TCEQ. Though two separate proposals for amending the DFC appeals process were introduced during the Legislative Session, neither version passed. As a result, the DFC appeals process at TWDB remains substantively unchanged.”

⁴² SB 737, 82nd Legislature.

³⁸ <http://www.texasgroundwater.org/pdfs/2011legeupdate.pdf>.

The MAGs, where available, are used as the mandatory basis for groundwater availability in regional water planning. They are also a major consideration in permitting decisions and other groundwater management activities by individual districts. Their use and significance are best judged at the individual district level. For example, I reviewed the Hays-Trinity Groundwater Conservation District MAG for the Trinity Aquifer before my speech to the International Right of Way Association in San Antonio in the fall of 2011. What does this particular MAG mean for the future of Hays County? Under current domestic and livestock well exemptions (no permit required for a well that is incapable of producing more than 25,000 gallons per day on a 10-acre tract), it appears to me that in a decade or so, the groundwater in the Hays-Trinity GCD may become fully allocated.⁴³ Does it follow then that the district will not allow any new water wells? What if a new crop is economically feasible and requires irrigation? Does this indicate that no new irrigation permits can be issued? If an existing landowner wants to change the use of the property to some use requiring irrigation, is that landowner going to be denied the request? Will the existing landowner have priority over the new landowner if they request irrigation permits at the same time? Did this create 2 classes of landowners? I do not have the answers, but assuming that the model accurately considers the consequence of growth in its jurisdiction and the GCD maintains its current definition of exempt wells, the district's ability to "manage" its groundwater production with the large number of exempt wells is effectively eliminated.⁴⁴

The TWDB website publishes the MAGs for all of the districts in the state.⁴⁵ They are interesting to review for the various areas of the state. What will land values do in the future in the case that the full effect of exempt domestic and livestock use is considered?

Having presented a broad overview of GCDs, the following results of the study found in Appendix 1 indicate the vast differences in the revenues, budgets, and other financial structure of GCDs across the state. It bears repeating that smaller revenues and expenditures do not necessarily indicate a crisis in financial needs for the district. Geography, popu-

lation density, socio-economic conditions, and groundwater demand more appropriately dictate financial decisions per GCD along with other factors that require more or less funding, including most importantly available studies and data.

Yet with the "sword-of-Damocles" statement made by the TWDB in the State Water Plan for 2012 cover letter, ("The primary message of the 2012 State Water Plan is a simple one: In serious drought conditions, Texas does not and will not have enough water to meet the needs of its people, its businesses, and its agricultural enterprises.") maybe the state should begin assisting every GCD in planning a regulatory program to avoid the worst-case scenario, with periodic adjustments to the program to ensure the DFCs are achieved. Regional Water Planning Groups⁴⁶ are mandated by state law to use the groundwater availability information generated by GCDs and the TWDB (MAGs and DFCs) in an effort to plan, considering all aspects of water that recognizes the "conjunctive"⁴⁷ relationship between all kinds of water. One of the most prudent things the state can do is to set up or provide the resources to ensure that a key "weapon" to combat the predicted extreme aridity will be there when needed; that weapon is money. An equally important "weapon" is conservation-oriented practices, which include incentives to conserve and a dedicated campaign to educate Texans as to the value and essential need to conserve water in their daily lives.

It was encouraging for water planning statewide that the citizens of Texas passed Proposition 2 in the fall of 2011.⁴⁸ Proposition 2 authorized the state to provide access to state credit up to \$6 billion to help finance water infrastructure needs in the future. While this is far short of the \$53 billion needed according to the 2012 State Water Plan, Proposition 2 indicated a majority of Texans recognized the significance of water to our future quality of life. State Senator Troy Fraser and House Representative Allan Ritter presented bills in the ongoing current session of the Legislature to extract \$2 billion in funding for the 2012 State Water Plan from the "Rainy Day Fund," and the House bill met resistance and was generally killed in the House of Representatives in early May. However, a compromise was reached Friday, May 17,

⁴³ Of course, it would be exceedingly rare to find any domestic and livestock well using 25,000 gallons per day. Using the 25,000 gallons per day to evaluate the actual availability of groundwater is problematic since it seems impossible to imagine anyone using that much water daily. However, my point here is that the 25,000 gallons per day is a ridiculous amount to use anywhere in a regulatory formula to determine whether a domestic and livestock well could be drilled without a permit.

⁴⁴ The Legislature changed the Texas Water Code 36.1132 in 2011 to be clear that a MAG is not a permit cap, but rather 1 of several considerations and criteria that the GCD Board should consider under 36.113 and 36.122.

⁴⁵ <http://www.twdb.state.us/GwRD/GMA>

⁴⁶ Regional Water Planning Groups are designed as an attempt to address the conjunction relationship of groundwater to surface water over the state through a joint planning process.

⁴⁷ All water exists in a conjunctive relationship; groundwater feeds surface water, surface water and diffused surface water (rain) feed groundwater. Planning regulatory support for either type of water without consideration for the other is a mistake the state is trying to avoid with the regional planning groups.

⁴⁸ Proposition 2 results were 347,614 for (51.52%), 327,076 against (48.47%).

which brings back the possibility of funding the \$2 billion to the House floor as early as the week of May 20.

FINANCING GCDS – WIDE VARIATIONS IN NEEDS AND BUDGETS

Some GCDs in Texas face significant funding challenges, as they have statutorily restricted water use fee rates and low ad valorem taxation rates.⁴⁹ Some GCDs cannot afford to open their offices more than a few days a week or even a month.⁵⁰ Many times voters express their keen desire to establish a GCD but are not willing to vote any amount of additional taxes for adequately funding the GCD. GCD revenue can also be generated from water use fees on production from larger, non-exempt wells and from miscellaneous other fees, such as new well permit fees. However, in some GCDs there is not enough groundwater production from larger wells and not enough applications for new well permits or other fee-based activities to generate adequate revenue from such fees for full-time operations.

Yet, is more money needed in all the GCDs? Every GCD manager I talked to when asked if more money was needed, of course, said more money would be helpful. However, they all said more funding is not necessarily needed. In some ways my question was unfair; if a GCD manager says no money was needed, the tendency for their constituents will naturally be to move to reduce ad valorem taxes and fees. Along the same lines, if a GCD manager says a great deal of new money is needed, then the tendency for the public will naturally be to resist. The dire worldwide economic conditions certainly lead all prudently thinking people to be reticent about any commitment to higher fees or taxes. Some of the managers mentioned a need for more support, such as money for sample meters for irrigation and other wells. Every manager mentioned a desire for more detailed research to better determine as closely as possible the amount of groundwater existing in the district, its sources, and its characteristics. The Crockett County Groundwater Conservation District manager told me they discovered/accessed a “new” aquifer last summer, the Santa Rosa, introducing the idea that we may have ground-

⁴⁹ As mentioned before, a GCD may set an ad valorem tax equal to \$.50 per \$100 valuation and it may also set \$1 per acre-foot annually for agricultural use or \$10 per acre-foot annually for water used for any other purpose. The key word here is “may.” It is up to the local board of the GCD, where a GCD exists, to make these decisions with the support of local voters.

⁵⁰ A GCD manager in west Texas told me in 2009 that his entire annual budget was only \$13,000; it has since increased to \$20,000. Many GCDs simply cannot afford to keep their offices open to the public 5 days a week, yet in several cases, the demand is such that the offices need not open daily.

water resources heretofore undiscovered or unused, a very encouraging development.⁵¹

THE STUDY

Appendix 1 shows the results from 35 respondents to these questions I submitted on basic financial aspects of Texas GCDs:

- What is your budget for the current year or most recent year?
- What is your total revenue (if possible separated by type and source)?
- What are your total expenses?
- How many wells are permitted and what type are they?
- How many exempt wells are in your district?
- How many permanent employees do you have?
- What are the hours and days of the week your office is open?

While all the GCDs in Texas are public agencies and subject to public information request regulations, I sought only volunteer responses; I did not modify the raw results. If a respondent did not answer a question, the box in the Appendix is filled with the comment “no response.” Some districts are fee-based only without ad valorem tax support. Some gain almost all their revenue from ad valorem taxes: rates range from \$.005/\$100 valuation to \$.03/\$100 valuation. For example, if a property is valued at \$100,000 and the ad valorem tax collected for the GCD is \$.03/\$100 valuation, then the amount that property owner pays to the GCD is \$30 per year. For context, school district tax rates are usually \$1.50/\$100 valuation, which equates to \$1,500 in our example. While many certainly may consider GCDs an ad valorem tax, which is significant, it is fair to say those GCDs ad valorem tax rates are usually the lowest in any county.⁵²

⁵¹ Interview with Slate Williams.

⁵² The Texas Water Code section 36.201 caps the ad valorem tax rate a GCD may charge at \$.50 per \$100 of assessed valuation. There are GCDs that assess more than the voluntary participants in this preliminary survey do. Please see the State Auditor’s schedules. According to the August 31, 2011 Texas Bond Review Board Local Government Annual Report, “State law sets limitations on certain local government debt issuers by setting maximum ad valorem tax rates per \$100 of assessed property valuation. These rates vary by government type, but all must generate sufficient funds based on annual ad valorem tax collections to provide for the payment of the debt service on outstanding and projected ad valorem tax (GO) debt. Additionally, all public securities issued by local debt issuers must be approved by the Office of the Attorney General – Public Finance Division (OAG) and registered with the Texas Comptroller of Public Accounts. For reporting purposes issuances that combine both tax-supported and revenue bonds are categorized as tax-supported debt.”

ISSUANCE OF BONDS AND NOTES

GCDs generally have the ability to issue bonds and notes for capital improvements with the approval of the voters in their jurisdiction, the TCEQ, and the Attorney General.⁵³ Section 36.020 of the Water Code provides this authority for the GCDs:

BOND AND TAX PROPOSAL. (a) At an election to create a district, the temporary directors may include a proposition for the issuance of bonds or notes, the levy of taxes to retire all or part of the bonds or notes, and the levy of a maintenance tax. The maintenance tax rate may not exceed 50 cents on each \$100 of assessed valuation.

(b) The board shall include in any bond and tax proposition the maximum amount of bonds or notes to be issued and their maximum maturity date.

Section 36.201 further outlines this authority:

LEVY OF TAXES. (a) The board may annually levy taxes to pay the bonds issued by the district that are payable in whole or in part by taxes.

(b) The board may annually levy taxes to pay the maintenance and operating expenses of the district at a rate not to exceed 50 cents on each \$100 of assessed valuation.

(c) The board may not levy a tax to pay the maintenance and operating expenses of the district under this section until the tax is approved by a majority of the electors voting at an election in the district held for that purpose. The district may:

(1) hold an election for approval of the tax at the same time and in conjunction with an election to authorize bonds, following the procedures applicable to a bond election; or

(2) hold a separate election for approval of the tax in accordance with Subsection (d).

(d) An order calling a separate election for approval of a tax under this section must be issued at least 15 days before the date of the election, and the election notice must be published at least twice in a newspaper of general circulation in the district. The first publication of the notice must be at least 14 days before the date of the election.

⁵³ It is noted that section 36.171 of the Texas Water Code provides that the TWDB may issue and sell bonds and notes in the name of the GCD for any lawful purpose of the GCD. TCEQ approval is not required for refunding bonds. A bond election is required only if the bonds are secured in whole or in part by taxes. Bonds issued in the name of the GCD would be tax exempt, which may make them attractive to investors.

PROMULGATION OF FEES

Section 36.205 of the Water Code provides this authority for the GCDs:

AUTHORITY TO SET FEES. (a) A district may set fees for administrative acts of the district, such as filing applications. Fees set by a district may not unreasonably exceed the cost to the district of performing the administrative function for which the fee is charged.

(b) A district shall set and collect fees for all services provided outside the boundaries of the district. The fees may not unreasonably exceed the cost to the district of providing the services outside the district.

(c) A district may assess production fees based on the amount of water authorized by permit to be withdrawn from a well or the amount actually withdrawn. A district may assess the fees in lieu of, or in conjunction with, any taxes otherwise levied by the district. A district may use revenues generated by the fees for any lawful purpose. Production fees shall not exceed:

(1) \$1 per acre-foot payable annually for water used for agricultural use; or

(2) \$10 per acre-foot payable annually for water used for any other purpose.

(d) The Lone Star Groundwater Conservation District and the Guadalupe County Groundwater Conservation District may not charge production fees for an annual period greater than \$1 per acre-foot for water used for agricultural use or 17 cents per thousand gallons for water used for any other purpose. This subsection shall take precedence over all prior enactments.

(e) Subsection (c) does not apply to the following districts:

(1) the Edwards Aquifer Authority;

(2) the Fort Bend Subsidence District;

(3) the Harris-Galveston Coastal Subsidence District;

(4) the Barton Springs-Edwards Aquifer Conservation District; or

(5) any district that collects a property tax and that was created before September 1, 1999, unless otherwise authorized by special law.

(f) A district, including a district described under Subsection (d), may assess a production fee under Subsection (c) for any water produced under an exemption under Section 36.117 if that water is subsequently sold to another person.

(g) A district may assess a transportation fee under Section 36.122.

PERSPECTIVES ON FINANCE TOOLS AVAILABLE TO GCDs FROM THE RESULTS OF OUR INITIAL STUDY

Chapter 36 provides the GCDs with a number of funding mechanisms or tools. But are these practical? Are they being used by the GCDs?

Perspective on the Issuance of Bonds

First, as to bonds, the survey results show none of the participants in our survey mentioned any bonded indebtedness. The lack of interest by GCDs to use the tool of issuing bonds for finance purposes is confirmed by searching the Texas Bond Review Board site. The Texas Bond Review Board was created by the Legislature in 1987 to:

... ensure that debt financing is used prudently to meet Texas' infrastructure needs and other public purposes, to support and enhance the debt issuance and debt management functions of state and local entities, and to administer the state's private activity bond allocation.⁵⁴

Assuming GCDs would be considered local government entities by the Bond Review Board, the August 31, 2011 Texas Bond Review Board Local Government Annual Report does not even include anywhere in the 82-page report the words "groundwater conservation district."⁵⁵ Surely the concern about voter rejection of a bond proposal for a GCD is valid; my interviews with GCD managers confirm this concern. However, there are other reasons, such as the inability to amortize or retire a proposed bond. Why?

For current open market terms for bond sales, I interviewed a municipal bond broker. According to him⁵⁶, today's interest rate for a non-rated local government entity bond would probably be around 3.5% to 3.75% annually. The near-perfect credit-rated State of Texas bond interest rates range from 3% to 3.5% today. The maturities of non-rated local bonds generally run 20 to 25 years.

It is difficult to imagine, for example, considering the level of annual gross revenues of most of our survey participants, that many could afford to service a bond. Assume a \$500,000 bond maturing in 25 years at 3.75%, the annual payment in interest alone would be \$18,750. If the same bond was \$1 million, then the annual interest payment would be \$37,500.

A \$5 million bond would require an annual interest payment of \$93,750. The annual interest payable on the \$1 million bond exceeds the total annual gross revenues of some of the participants in our study; the \$5 million bond interest service would heavily burden most of our survey participants.

Would local voters approve a new ad valorem tax to cover their GCD's bond? It is safe to assume those GCDs that do not now have approval of their voters for an ad valorem levy would likely not approve a new tax for a bond. Would they consider it for a special project that benefits the entire GCD? Some may, most would not. (Keep in mind that the "not to exceed" limitation of 50 cents per \$100 valuation is only applied to maintenance and operating expenses and not to bonded indebtedness. There is no statutory limitation mentioned in the water code as to bonded indebtedness tax levies.) Voter approval requires an expensive advertising and information campaign, again expenses most of our study participants would be hard pressed to cover.

According to a study done by Texas Comptroller of Public Accounts Susan Combs, the November 2011 voter turnout for bond elections in select counties across the state ranged from 5.8% in Montgomery County to 12.6% in Mitchell County. Per page 7 in the study, "There is no minimum voter participation required to approve debt issues, and typically few voters cast ballots in bond elections." Weak voter turnout may impact the election results at times; at times it may not. Some counties such as Travis County in the Combs study had an 8.5% turnout and voters approved its 2 proposals with a 3 to 2 majority. Conversely, a \$200 million bond proposal for roads was defeated in Montgomery County.⁵⁷

None of our participants has ad valorem taxation authority to levy at the full limitation of 50 cents per \$100 valuation. Take for example those participants who have been authorized to levy an ad valorem tax of one-half cent per \$100 (.005/100), then a \$1,000,000 bond requiring \$37,500 annual interest payments indicates that the total GCD ad valorem tax base (the district-wide total assessed value of all property in the GCD) would have to be at least \$750 million. The total ad valorem tax base of some Texas counties does not equal \$750 million.⁵⁸

The results also show that not all of the participants had approval⁵⁹ from their voters to levy ad valorem taxes. The na-

⁵⁷ Susan Combs. "Your Money and Local Debt." Texas Comptroller of Public Accounts, September 2012, 7.

⁵⁸ See the State Comptroller's website for county-by-county total ad valorem tax base valuations at <http://www.window.state.tx.us/propertytax/administration/pvs/findings/2012p/>

⁵⁹ We did not ask the GCDs if they had sought past approval to levy ad valorem taxes nor did we ask if they had sought approval and such approval was rejected by the voters. It will be an interesting question to include in a future update of this paper.

⁵⁴ <http://www.brb.state.tx.us/agency/overview.aspx>

⁵⁵ August 31, 2011 Texas Bond Review Board Local Government Report found at <http://www.brb.state.tx.us/pub/lgs/fy2011/2011LocalARFinal.pdf>

⁵⁶ March 20, 2013 phone interview with David S. Brollier, RBC Dain Rauscher in Houston.

ture of the Texas electorate many times in the past has been to limit new ad valorem taxes. In 2012, new school district bond elections were successful in 71% of the bond proposals.⁶⁰ When the statute repeats the phrase “not to exceed 50 cents per \$100 dollar valuation, to me it generally means that the Legislature meant this limitation to be fully understood by all. The maintenance and operating tax must be approved by the voters “at the same time and in conjunction with an election to authorize bonds.”

If a GCD decided to propose a bond proposal without state support for the underwriting of the bond, it may find little interest in the investor marketplace for a locally guaranteed solely by the local GCD at this time. This would be in contrast to the statewide voter-approved Proposition 2 in the fall 2012 that provided up to \$6 billion in state-issued bonds for water infrastructure projects. There are several major cities around the country that have filed for well-publicized bankruptcy proceedings and others may follow; therefore, the likelihood that a smaller local government entity like a GCD could find investors would be limited if not impossible.

The bottom line is that the “not to exceed” limitations on the GCDs authority to raise revenue plus the approval required by the voters may be the reason no participant in our study has issued any bonds. The tool of bond issuance is not a practical one for the GCDs in their real-life financing plans.

Yet, the issuance of bonds remains a possibility in the future for finance of GCDs. The TWDB Loan Assistance Fund is an additional source of support for GCDs.⁶¹

Perspective on the Issuance of Notes (Borrowing)

The water code allows GCDs to issue notes. If a GCD chooses this path to finance a project and seeks an institutional lender, the typical underwriting standard in determining the loan amount is 70% of cost or value, whichever is the lesser. In other words, a water project costing \$1 million, if qualified in all other ways such as the creditworthiness of the GCD and the reliability of its gross revenue stream, would at most qualify for a \$700,000 loan. This means the GCD would have to make a “down payment” of \$300,000 cash to build the project. Many of our participating GCDs do not have this amount of cash available, and this amount again exceeds many of our participants’ gross annual reported revenues. Issuance of notes is another tool available by statute, but impractical and rarely if ever used by our participants except in minor amounts for very short terms. Qualifying for

a typical institutional loan may prove elusive for the GCDs.

Another requirement of an institutional lender would be collateral for the loan, which is usually provided by a deed of trust on the water project itself. The reluctance of a lender to foreclose on a defaulted water project is an obvious hurdle to a prudent lender’s decision to make a loan. What do they do with the asset after foreclosure? Who could possibly run it without incurring losses? The State of Texas would likely be asked to guarantee the loan.

Perspective on Establishing Fees

GCDs have a variety of options available to them for fees as outlined in the Texas Water Code section 36.102. A GCD may set fees for administrative acts of the district such as filing applications.⁶² A district shall set and collect fees for all services provided outside the boundaries of the district. A district may assess production fees based on the amount of water authorized by the permit to be withdrawn from a well or the amount actually withdrawn not to exceed \$1 per acre-foot annually for agricultural use or \$10 per acre-foot for water used for any other purpose.⁶³ A district may assess a production fee under Subsection (c) for any water produced under an exemption under 36.117 if that water is subsequently sold to another person. A district may assess a transportation fee under 36.122. Section 36.206 allows temporary boards to set user fees for the creation and initial operation of a district. Section 36.122 allows a district to impose a reasonable fee or surcharge for an export fee. Of course, civil penalties under 36.102 are a potentially significant source of revenues for GCDs.⁶⁴

The obviously most significant fee structure would be the per acre-foot fees of \$1 for agricultural use and \$10 for any other use. Yet, these limitations are couched in “not to exceed” language, another restriction on financing possibilities for GCDs. The same political problems exist with these usage fees. Surely some GCD board of directors would come under heavy siege from users in their jurisdiction for any fee structure. A future study will analyze in detail the fee structure of all the GCDs, but participants in our study who volunteered fee information did not charge the allowed amounts.

GCDs may also make or accept grants, gratuities, advances, or loans in any form to or from any source approved by

⁶² Fees set by a district may not unreasonably exceed the cost to the district of performing the administrative function for which the fee is charged.

⁶³ This section does not apply to the Edwards Aquifer Authority and certain other districts (see subsection C part iv. and v.).

⁶⁴ The GCD may rule a penalty of up to \$10,000 per day per violation. Penalties may be enforced in court, and if the GCD prevails, there is a mandatory award of court costs, attorney fees, and expert fees.

⁶⁰ <http://www.tspra.org/news-and-reports/tspra-newsroom/bond-tax-rate-elections/453-texas-school-bond-election-results-from-november-6-2012>

⁶¹ See Texas Water Code Subchapter F.

the board, including any governmental entity, and may enter into contracts, agreements, and covenants in connections with grants, gratuities, advances, or loans that the board considers appropriate.⁶⁵

Other revenues available to a GCD are allowed to come from ownership or operation of a GCD's works, improvements and facilities and from the sale, transportation and distribution of water.⁶⁶ A GCD may sell, transport, and distribute surface water or groundwater. A future update of this study will seek detailed information of these other revenue sources that are not mentioned in any of the documents provided us by the participants in this preliminary study.

OTHER OPTIONS FOR SUPPORT OF GCDS

There are ways to accomplish GCDs' core duties without any funding, such as securing research information from the TWDB and third party sources. The TWDB provides groundwater availability models; the TCEQ must budget for water availability models. GCDs can rely upon TWDB-funded groundwater availability models and technical information supplied by applicants and third parties. The TWDB, on request, shall make technical staff available to serve in a non-voting advisory capacity to assist with the development of DFCs. GCDs may require permit applicants to provide hydrogeological reports and other technical information to prove up applications during the permitting process. GCDs have the authority to require permit holders to maintain and provide reports of "drilling, equipping, and completing of water wells and of production and use of groundwater." Third parties often provide modeling and technical information, especially those wishing to obtain export permits. Well driller's logs are available and existing data as well from many state agencies.

Some GCDs participate in weather modification programs, which is best described as cloud seeding. The Crockett County Groundwater District, for example, allocated \$80,500 of its \$215,826 total 2011–2012 budget or 37% of the budget to weather modification.⁶⁷ Several GCDs have participated in this program for a number of years and all told me they thought the program was very helpful and that their constituents see cloud seeding as a true benefit of the GCD.

Correlations between total expenses and permitted ir-

rigation wells, general permit registrations, households in the district, and other demographic characteristics were not indicative of any usable trend or ratios. The GCDs are simply too diverse in size, local rule structures, fees, and geography to draw any overall conclusions. What is indicated is that GCDs must be studied individually as self-supporting local entities, keeping in mind that the local boards of directors know best the needs of their jurisdictions. One echo across the GCD managers I personally interviewed was clear—they want no unfunded state mandates. Another indication from my interviews is that the GCDs could use help from accurate research as to the groundwater actually in place in their district along with help in getting an accurate count of the exempt domestic and livestock wells and their water volumes drawn. The amount of groundwater actually being used and the amount actually available seem to be the critical need and one of the only things all the GCDs have in common.

A WORD ABOUT OIL AND GAS WATER USE

In the areas of our state, the most significant financial impact in groundwater is the shale oil and gas drilling boom. Oil and gas exploration water wells are exempt from exploration permits; therefore, there is almost no impact to the revenues of GCDs from this activity. However, the impact on local economies is, temporarily at least, very positive. In the end, the impact on groundwater supplies could be less positive as some of the groundwater used may never be replaced by nature.⁶⁸

SALES OF GROUNDWATER TO OIL AND GAS EXPLORERS

Fracturing in exploration for oil and gas from deep shale formations uses huge amounts of water, almost all of which comes from groundwater. The sale of this water to the oil and gas explorers has been very helpful to struggling farmers and ranchers in these boom areas. Prices for water run from \$.42 per 42-gallon barrel to \$.80 and beyond. Considering some wells require up to 155,000 barrels of water to successfully conduct the fracturing, the range of payment to a farmer or rancher for groundwater for 1 well can be from \$65,100 to \$124,000, a sorely needed source of revenue especially considering the devastation of agribusiness still lingering since the terrible statewide drought of 2011.⁶⁹

⁶⁵ Texas Water Code 36.158. 36.160 gives approval to other agencies to allocate funds to carry out the objectives of Chapter 36. 36.161 allows the TWDB to provide funds under 36.159 and 36.160, Chapters 15, 16, 17, and Subchapter L to a district if the TWDB determines such funding will allow the district to comply or continue to comply with provisions of Chapter 36.

⁶⁶ Texas Water Code 36.172.

⁶⁷ 2011–2012 Budget for the Crockett County Groundwater District.

⁶⁸ Of course, this is true of any use of the aquifer.

⁶⁹ "Exploration" for oil and gas is exempt from permitting, however, "production" of oil and gas is nonexempt (see the Texas Water Code 36.117(b)(2)).

There are some unconsidered negative consequences for the individual farmer/rancher and the community as a whole. One rancher I interviewed on his place took me to 1 of the many 50 acre-foot above-ground holding tanks that oil and gas explorers have built to store water, which is then hauled or piped in all manner of ways to the wells being drilled and completed.

The 50 acre-foot tank in Figure 3 located in the Crockett Groundwater Conservation District holds 387,918 42-gallon barrels or 16,292,550 gallons. Assuming the price range paid by oil and gas explorers in this area is \$.42 to \$.80 per 42-gallon barrel, then this 1 tank represents water worth from \$162,926 to \$310,334. There are 16 of these in the district as of July 17, 2012. These 16 tanks together represent water worth from \$2,606,816 to \$4,965,344. Keep in mind that these tanks are being drained then refilled as needed, so the aggregate total paid by the oil companies is certainly much more. The water sales to oil and gas explorers alone in this district have dramatically impacted the local economy.

The rancher told me that the money from groundwater sales was very helpful to his family, but he noticed his windmills, the only water sources for his cattle, were beginning to “clank” and not bring up as much water as before. He said he thought his groundwater source was not an aquifer, but from individual underground pools of water, which he worries may not recharge, or at best, recharge only very slowly. Keep in mind that his underground pool of water is groundwater nonetheless. Yet he cannot in all good prudence pass up the money that so greatly helps his family and pays the relentlessly increasing ad valorem taxes and other carrying costs to hold his land. If the shallow wells dry up on his place, he has to either drill deeper wells (very expensive considering the expense of drilling and especially the heavy casing needed at deeper depths) or sell his cattle.



Figure 3. Oil and Gas 50 Acre-foot Holding Tank.

AN UNINTENDED CONSEQUENCE OF GROUNDWATER SALES

I did not bring up to him the question that immediately came to my mind so as not to cause him further consternation: what is he going to do to keep his agricultural exemption on his land? The land is not farmable without irrigation. There is not enough groundwater available in adequate amounts to farm with irrigation in the heat and aridity of this area in Texas. Without livestock or farming there is potentially no more agricultural valuation for his property; the agriculture valuation reduces ad valorem taxes paid as much as 77% or more in some counties.⁷⁰ Not only could he lose the benefits of the exemption, which are substantial, but once lost, he will be required to pay a 5-year “rollback” tax immediately. On several thousand acres, the “rollback” alone could wipe out much of the benefit of the groundwater sales; the new tax due without the agricultural exemption could pressure him into a forced sale of long-held family property or he could face losing the land to tax foreclosure in the worst case. Once a property loses the agricultural exemption, it can only be regained after 5 consecutive years of agribusiness activities. All of the less obvious consequences of depleting groundwater by selling it to oil and gas operations must be considered prior to deciding to sell.

THE FUTURE OF GCDs

GCDs protect everyone’s interests in groundwater. The Legislature continues to confirm that GCDs are Texas’ preferred method of groundwater management. Yet not all of Texas is protected by a GCD. The GCDs surveyed operate efficiently and honor tight budgets. This study indicates a need for more research money from grants or the state to determine more accurately the amount of groundwater actually in the districts, the source of the groundwater, and its physical characteristics. I agree with Kirk Holland—every square inch of Texas should have a GCD as manager of the groundwater. Across the board, Texans profess to the vital importance of groundwater in their lives, but seem more willing to buy new tennis shoes and Starbucks coffee than give the proper support to the preferred managers of groundwater, GCDs.

Education of the local electorate about available groundwater supplies, the nature of groundwater formations, and current groundwater demands could garner support for better

⁷⁰ There is another exemption available, a wildlife agriculture valuation (commonly misnamed as an exemption; it is not an exemption from tax but a contingent valuation reduction), which has to be approved, implemented annually, and reported annually. This could be a possible alternative for water sellers finding themselves in this predicament.

funding of local GCDs. Because of my work in the field and my classes to countless members of the public around the state educating them about the benefits of well monitoring, data collection, and research as to the true groundwater available in their area, I have confidence that the local electorates might support higher fees or taxes to fund fair and accountable groundwater conservation district regulatory programs.

The local electorate should remember GCDs hold public hearings often; all Texans should take the time to attend and offer their opinions. Each GCD manager interviewed strongly encourages comments and opinions from their constituents to help the GCD leadership make better decisions for everyone.

SUMMARY

While the Texas Water Code provides a number of tools for GCDs to finance their operations, most are impractical or, in reality, unavailable to use for many GCDs due to fee restrictions, ad valorem tax rate restrictions, local voter approval, and bond/note market requirements and conditions. The Legislature is making strides towards the funding of at least \$2 billion to the 2012 State Water Plan and the people have approved the \$6 billion in state credit to be used to support water infrastructure projects.

GCDs, if they continue to be the preferred method of groundwater management in our state, simply must be adequately funded to be effective and protect our most precious natural resource.

APPENDIX 1 — RESULTS

District	Total Revenue	Total Expenses	Total permitted wells	# Exempt Wells	# Permanent Employees	Hours Operation
Barton Springs/ Edwards Aquifer Conservation District	2012 total projected income: \$1,420,170	2012 projected expenses: \$1,419,892	No response	995 exempt (but altogether produce less than about 4% total groundwater withdrawn in district)	9 staff members	8–5 M–F
Brewster County Groundwater Conservation District	Per phone conversation	\$20,400; Most recent data available from website – 2008 approved budget; January 7, 2008 Board of Director's Meeting Minutes	No response	No response	1 permanent employee	No response
Brush Country Groundwater Conservation District	Only revenue received is from tax levy at \$.03/100 valuation; Collected for 2010 was about \$594,000	2009–2011: \$189,187.05; 2012 budget: \$465,297	"District has not developed rules so they have yet to issue a water permit for non-exempt well. Our guess is that there are between 6 to 7 thousand exempt wells in the district. The exact number will not be known until all wells are located and registered in the water well registry database that I am currently working on. District has not yet written their first annual report."	No response	1 (and plans of hiring part-time secretary within next 4 months)	8–5 M–F
Central Texas Groundwater Conservation District	Total income: \$496,076.00 (from ad valorem tax at \$.01/100 valuation was \$457,076.00)	\$495,137.50	Total well registrations as of June 6, 2012: 3414; Rules require registration only for wells drilled after September 1, 2009	Exempt well drilling auth.: 445	3 employees (general manager, hydrologist, and administrative assistant)	8–5 M–F
Cow Creek Groundwater Conservation District	Total revenue: \$347,635 (Tax collected at \$.005/100 valuation was \$190,235)	Total estimated expenses: \$339,230	72+ permitted	6500+ exempt	3 permanent employees	8–5 M–F
Crockett County Groundwater Conservation District	Ad valorem tax rate for 2011–2012: \$.01107	Total budget for 2010–2011: \$217,000; Proposed for 2011–2012: \$215,826	No response	3 permitted irrigation wells	2 permanent employees	1–5 M–F; Manager on 24 hour call

APPENDIX 1 — RESULTS (CONTINUED)

District	Total Revenue	Total Expenses	Total Permitted Wells	# Exempt Wells	# Permanent Employees	Hours Operation
Goliad County Groundwater Conservation District	Ad valorem taxes at \$.0143/100 valuation were \$127,400; Permitted well fees: \$500; Well registration fees: \$665	Total expenses for current year: \$49,100	3 RV parks; 1 pipeline construction; 2 livestock and wildlife	5 domestic wells; 10 livestock wells; 22 domestic and livestock; 3 oil and gas supply	1	8–5 M–F
Gonzales County Underground Water Conservation District	Taxes: \$125,447; Export fees: \$75,000; Interest earned: \$3,000	\$250,000	30 public supply wells; 7 irrigation wells	Unknown at this time	3 permanent employees	8–5 M–F
Hays Trinity Groundwater Conservation District	\$187,287	\$146,512	No response	No response		M–Th 9–4
Headwaters Groundwater Conservation District	\$342,695.89 (87% from ad valorem taxes at \$.0074/100 valuation)	\$241,338.34	260	5,191	3 full-time employees	8–5 M–F
Hemphill County Underground Water Conservation District	Budgeted: \$452,773; Received: \$459,345	Budgeted: \$452,762; Spent to date 2012: \$274,867; Spent in 2011: \$377,810	New: 14; Replacement: 3; Re-equip: 1; Total: 18	7 domestic; 6 livestock; 25 rig supply	No response	No response
Hickory Underground Water Conservation District No. 1	Property taxes at \$.035/100 valuation were \$356,211; Delinquent taxes: \$9,752; Penalty and Interest: \$7,268; Total budget \$384,051.44	Balanced budget so that expenses equal revenue: \$384,051.44	66 municipal/public water supply; 66 industrial; 8 commercial livestock; 1 aquaculture (fish farm) well; 311 irrigation wells	516 domestic and stock; 1,289 domestic; 950 stock	3 permanent employees	7–5 M–F
High Plains Underground Water Conservation District No. 1	Total revenue from all sources \$2,632,982 (2011); Ad valorem tax rate 1011 \$.007766 per \$100 valuation lowered from \$.007853 per \$100 valuation in 2010	\$2,902,703 (2011)	13,103 center pivot systems – last inventory 2009 per 2011 published annual report	No response	No response	2 offices – one in Lubbock and another in Amarillo open M–F.

APPENDIX 1 — RESULTS (CONTINUED)

District	Total Revenue	Total Expenses	Total Permitted Wells	# Exempt Wells	# Permanent Employees	Hours Operation
Irion County Water Conservation District	2011–2012 budget: \$129,345; Ad valorem tax based at \$.01548/100 valuation; Population of district is only 1,700	Expenses not finalized until Sep. 30	Less than 20 that would need permits	about 1,800	1 full-time manager, 1 part-time secretary	No set office hours (Manager arrives about 7:30 field work and secretary is in office MTW 1–5)
Kenedy County Groundwater Conservation District	2012 budget: \$248,000; Ad valorem tax rate: \$.0153/100 valuation	Estimated 2012 expenses: \$248,000	40 wells operated under a permit (14 for public water supply, remainder for agriculture or commercial uses)	No response	1 permanent employee	8–5 M–F
Lost Pines Groundwater Conservation District	\$206,805.27	\$390,691.97	Non-exempt: 82 municipal and 27 irrigation	1216 domestic; 173 livestock; 57 irrigation; 23 industrial	3 permanent employees	8–5 M–F
Lower Trinity Groundwater Conservation District	2012 budget: \$99,209; Revenue from \$.05/1000 gallons of groundwater utilized from permitted wells	Expense normally run +/- 5% annual budget	160 permitted (public water supply) wells	541 exempt (primarily rural)	1 permanent employee (serves as general manager), works approx. 20 hrs per week	7:30–4:30 M–F
Medina County Groundwater Conservation District	Taxes at \$.0083/100 valuation 2012 to \$.09/100 valuation: \$189,780; Total revenue: \$227,980	Total estimated 2012 expenses: \$258,170	110 wells permitted for irrigation use; 10 for municipal; 6 for industrial (quarries)	Estimate between 400–500	2 full-time employees	8–5 M–F
Mid-East Texas Groundwater Conservation District	\$115,570 production fee revenue; \$4,000 non-compliance penalties; \$2,500 interest; \$500 other income	\$153,570	211 total (144 public water supply; 61 comm/ industrial; 6 irrigation)	Estimate of 5,000+ (an assortment of domestic/stock/ rig supply etc)	1	M 9–12 and 1–5; T–Th 8–12 and 1–4:30; F 8–12 and 1–4
Neches & Trinity Valleys Groundwater Conservation District	2012 adopted budget: \$195,850	\$195,220	223 for public water supply; 32 non-agriculture irrigation; 7 pipeline company use; 175 large domestic/ agriculture wells	10,000 to 11,000 exempt wells (all domestic or small agriculture which pump less than 25,000 gallons per day capacity)	2 full-time employees	8:30 to 5 M–F (closed 12–1 for lunch)

APPENDIX 1 — RESULTS (CONTINUED)

District	Total Revenue	Total Expenses	Total Permitted Wells	# Exempt Wells	# Permanent Employees	Hours Operation
North Texas Groundwater Conservation District	2012 budget: \$478,597; \$.10 per thousand gallons pumped on non-exempt wells to generate funds for budget; covers 3 counties: Collin, Cooke, and Denton	Personnel costs: \$167,000	635 registered wells	151 exempt total	7 shared part-time employees with Red River	8–5 M–F
Panhandle Groundwater Conservation District		2011: \$1,246,556.41	Well permits approved for 2011–2012: 136	No response	9 staff members	No response
Pineywoods Groundwater Conservation District	2011 budget: \$193,084	2011: \$137,523	Total district wells in database: 2,144	1,411 (and 200 more unregistered exempt wells)	2 permanent employees	8–5 M–F
Plateau Underground Water Conservation And Supply District	2012 budget: \$125,000 (all of which was raised with ad valorem tax)		29 active irrigation permits and 8 industrial (all water sales mainly for oil and gas activity) permits	1,500 exempt	1 permanent employee	8–5 M–F
Plum Creek Conservation District	All income from ad valorem taxes; District has both flood and groundwater responsibilities; Tax rate applicable to groundwater is \$0.0200. "We have no fee based income from water sales or transfers out of the District."	Budget for 2011–2012 allocable to groundwater responsibilities: \$802,695	"PCCD has 54 permitted wells with 21 for irrigation, 12 for poultry, and 21 for public supply"	"We have an estimated 535 exempt wells in our District. This does not include the total exempt wells for Caldwell County. I am unable to categorize these wells, but most are for domestic and livestock. There are probably only a few exempt wells used for oil and gas."	4 permanent employees	8–5 M–F
Post Oak Savannah Groundwater Conservation District	Production fees: \$314,244; Transport fees: \$931,947; Interest (estimate): \$25,000; Total revenue: \$1,271,191	Expenses budget for 2012: \$1,606,500	434 agriculture; 60 industrial; 104 municipal; 22 oil and gas	Estimated 4,500 domestic/livestock; 63 oil and gas	3 permanent (1 general manager, 1 administrative asst., 1 water resource management specialist)	8–4 M–F

APPENDIX 1 — RESULTS (CONTINUED)

District	Total Revenue	Total Expenses	Total Permitted Wells	# Exempt Wells	# Permanent Employees	Hours Operation
Red River Groundwater Conservation District	Budget of \$250,999; \$.06 per thousand gallons pumped on non-exempt wells to generate funds for budget	Administrative costs: \$137,960	289 enrolled wells	29 exempt wells	7 shared part-time employees with North Texas	8–5 M–F
Rolling Plains Groundwater Conservation District	Tax collections at rate of \$.0219/100 valuation: \$137,000; Interest earned on investments: \$5,000; Groundwater transport fees: \$10,000; Total 2011 budget: \$152,000; Proposed 2012 budget: \$152,000	2011 expenditures: \$131,092	No response	No response	1 permanent employee	9–5 M–F
Rusk County Groundwater Conservation District	Revenue: \$240,000 (from taxes, permits, inspections, and interest income)	\$250,000	3,400 registered wells	No response	3 full-time employees	8–5 M–F
South Plains Underground Water Conservation District	Tax collections at \$.025/100 valuation – Terry County: \$267,000.00; Tax collections – Hockley County: 475.00; Interest-checking: 100.00; Interest-CD: 4,235.00; Water depletion: 900.00; Accounts receivable – Other: 500.00; Total estimated revenues: \$273,210.00	Salaries and benefits: \$120,733.20; Supplies: \$16,450.00; Purchased services: \$59,250.00; Other expenditures: \$28,750.00; Capital outlay: \$27,000.00; Total appropriations: \$252,183.20	No response	No response	2 full-time employees	8–5 M–F

APPENDIX 1 — RESULTS (CONTINUED)

District	Total Revenue	Total Expenses	Total Permitted Wells	# Exempt Wells	# Permanent Employees	Hours Operation
Southeast Texas Groundwater Conservation District	Total expected revenue: \$155,961.00	Total estimated expense: \$117,626.44	13 total non exempt/ permitted	329 exempt for domestic; 39 exempt for other; 71 exempt from oil and gas related	1 full-time, 1 part-time bookkeeper	Open 5 days a week, manager mentioned he is available essentially 24/7 because phone calls forwarded to his cell phone
Sterling County Underground Water Conservation District	Ad valorem taxation rate is \$.00966/100 valuation; total revenue all sources was \$140,190	Expenses not finalized until Sep. 30	District does not have pumping limits and 99% use is D&L or oilfield (which is exempt)	About 700 exempt wells	Full-time manager and 1 part-time technician	No set office hours (manager available by cell phone, technician does work 3 days a week)
Trinity Glen Rose Groundwater Conservation District	2011 revenue: \$205,000 and 2012 budget: \$237,300	2011 operating expenses: \$208,300; 2012 operating expenses prediction: \$237,300	About 800 registered wells (majority of which drilled after 2002)	Out of the 800, about 600 exempt	3 part-time staff (work 20 hours each per week)	In office M–Th but also work outside office
Upper Trinity Groundwater Conservation District	\$1,337,750	\$1,047,431	Total registered wells: 363	Just May 2012 well registration break-down: 81 exempt and 5 non-exempt	6 staff members	8–12 and 1–5 M–F
Wintergarden Groundwater Conservation District	Total proposed income: \$665,017.67 (subtotal from tax revenue at \$.025/100 valuation: \$665,017.67)	Total proposed expenses: \$693,217.67	Total number wells registered in 2011: 283; Non-exempt: 50	233 exempt (140 for rig supply)	2 permanent employees	M–F 8–12 and 1–5