

BLUE DOG RANCH

*Home of CNC Smart Little Len
Milano, Texas*

6 August 2015

Office of the Chief Clerk
Texas Commission on Environmental Quality
12100 Park 35, Building F
Austin, Texas 78753

RE: Petition for Inquiry Submitted by Curtis Chubb, Ph.D.
TCEQ Docket No. 2015-0844-MIS

Ms. Bohac:

This letter accompanies the original and seven copies of the Petitioner's Reply Brief.

The reply brief has also been mailed to the other persons on the mailing list.

Please contact me if you have questions about my submission.

Thanking the Texas Commission on Environmental Quality for considering my Reply Brief,



Curtis Chubb, Ph.D.

PETITIONER'S REPLY BRIEF

PETITION FOR INQUIRY

*SUBMITTED BY DR. CURTIS CHUBB
TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY*

TCEQ Docket No. 2015-0844-MIS

6 AUGUST 2015

Introduction

The Petition for Inquiry focused on how the District's rules will render ineffective their attempts to cut back pumping when Threshold Level 3 is reached since the District is committed to issuing new pumping permits even when aquifers reach red-flag levels – a fact which they reiterate multiple times in their brief. The last two graphs of the Petition illustrate how the District's rules will neither protect the aquifers nor achieve the DFCs since the new pumping permits will be used to compensate for any reduction in pumping.

The ramifications of this error is understood when one considers that the \$3.4 Billion Vista Ridge Regional Water Supply Project was developed on the belief that the District will always issue new pumping permits even when aquifer drawdowns are near the DFCs. The Vista Ridge Project accounts for almost 50% of the pumping permits for the Simsboro and Carrizo Aquifers.

In their brief, the District leads one to believe that everyone accepts their authority to cutback permitted pumping. But what they didn't say is that those same people expect the District to approve their requests for new pumping permits so that there is really no cutback in pumping.

If, however, the District actually attempts to protect the aquifers by cutting back pumping permits without concomitantly issuing new pumping permits, I predict that a veritable "train wreck" will take place.

In support of this prediction, my brief includes quotes from a letter which details exactly what Abengoa, the principal company of the Vista Ridge Project, plans to do to ensure that their permitted 50,000 acre-feet/year of groundwater is delivered to San Antonio. If needed, Abengoa states that they will challenge the District in the courts and recruit the help of the Texas Legislature – they will not be going quietly into the night.

It is difficult for me to comprehend how the District believes that there will be no blow-back from a permittee who has paid about \$1.2 million/year for unused pumping and transport permits over several years when the District orders a cutback that the permittee cannot mitigate by requesting and being issued new pumping permits.

If the District had not put us in jeopardy by their extreme overpermitting, the possibility of our aquifers being harmed would be remote. Instead, the District's willingness to issue limitless numbers of pumping and transport permits has attracted water marketers from throughout the state to target our two counties. For example, the Lone Star Regional Water Authority's president described the District as "It is a district that wants to sell the water" in a presentation to the Hays County Commissioners Court in April 2014.

Instead of focusing on the Petition's main elements, the response briefs emphasized other topics; especially how the District's monitoring well network will ensure that DFCs are achieved and protect our groundwater. Subsequently, my reply primarily addresses the main discussion topics initiated in the response briefs.

The major emphasis placed on the monitoring network in the District's brief is brought to light by comparing the number of times that monitoring is mentioned by the District (30+ times) versus in the Petition (2 times).

Consequently in order to be able to reply to the District's and other respondents' briefs, I studied the District's monitoring network reports. To my surprise and dismay, I found that Threshold Levels 1 and 2 have already been reached – these important facts, however, have not been reported to either the board to my knowledge or to the public who has the right to know because it is their community that has been placed at risk.

The monitoring network also suffers from another equally important failure. Using information provided by the Texas Water Development Board (TWDB), I discovered that the District has misidentified the aquifers being monitored by 23% of their monitoring wells.

My main conclusion from the findings about the monitoring network is that no one has spent the time necessary to study either the monitoring wells or the monitoring well data. In the Petition, I highlighted that the rules do not specify who is responsible for the monitoring network data analysis (*Page 10*). If the rules had included this assignment of duties, it is highly possible that these inexcusable mistakes would not have happened.

The District's failure to detect these critical errors/failures in the monitoring network which they consider as their flagship for achieving the DFCs raises serious questions not only about their rules but their ability as an institution to protect and conserve our aquifers. As my cowboy friends would say: "All talk and no action."

The evidence presented below supports the following conclusions: 1) the extreme overpermitting of the Simsboro and Carrizo Aquifers not only reflects the inability of the District to comply with state law and enforce its rules, it has also placed Milam County in jeopardy as documented by my findings that Threshold Levels 1 and 2 in shallow management zones have already been reached; 2) the District cannot enforce substantial compliance with many of its rules because its monitoring network's problems will prevent important rules from being activated; and 3) the District's rules are designed neither to achieve the DFCs nor protect our groundwater.

The following discussion is constructed in a logical sequence with each section building on the preceding section's information.

The Present Rules Allow for Rules to be Amended and Created

The District, Brazos Valley GCD (*Page 1*), and TCEQ Executive Director (*Page 8*) briefs suggest that the District's current rules will protect our groundwater because they allow the District to amend the rules and adopt new rules in response to future events – or as the District says, the rules are a "living document" that is amended and modified regularly (*Page 4*).

The primary assertion is that because the District's rules allow them to adopt new rules and amend rules in response to aquifer declines, the new rules will correct the deficiencies of the present rules. The inherent problem with this reasoning is that there are no assurances that the District's new rules will be effective for protecting our groundwater.

I believe that Texas Water Code Section 36.1082 is referring to the District's present set of rules - which is the focus of the Petition and this reply brief.

The Gonzales County and Mid-East Texas GCDs' briefs take the idea that amended and new rules will counteract any problems with achieving the DFCs to a new level: the briefs state that they expect the District's directors and staff "to take whatever actions are necessary to address excessive aquifer declines and to achieve the adopted Desired Future Condition" (*Page 1*). This is a statement based on faith, not facts.

I mention the Gonzales County and Mid-East Texas statement here because it is preceded by stunning revelations that neither board of directors had reviewed or approved the submitted briefs - nor had they even read the District's rules. Based on this evidence, I submit that the two briefs were not approved by the GCDs, are not respectful of the Petition for Inquiry process, and should be removed from consideration.

Also, I consider it important to point out that Lost Pines GCD's brief "takes no position." The only two short briefs that can be considered as supporting the District were filed by Brazos Valley and Fayette County GCDs. The other six GCDs that were requested to submit a brief did not respond (3), filed briefs not approved by the GCDs' boards (2), or took no position (1).

Protection of Private Property Rights

SB 332 was passed in 2011 to codify that landowners own the groundwater below the surface of their land as real property [*Texas Water Code 36.002(a)*]. I testified on behalf of that bill and was present when it was passed – private property rights are important to me.

So, that is why I take exception to the assertion in the TCEQ Executive Director's brief that the Petition suggests that my ideas don't "consider a landowner's right to produce groundwater beneath his/her property" (*Page 12*).

On the contrary, it is the District that disregards private property rights. I and others have been raising this issue for years – only to be ignored by the people who are supposed to represent us.

Although the District advertises that they protect private property rights by approving all permits and allowing everyone to pump 2 acre-feet/acre at present, it is an "illusion" as stated in the Petition (*Page 9*). The basis for calling it an "illusion" is that the rules only protect the private property rights of a small subpopulation of landowners.

Although it is incumbent upon the District's rules to protect the private property rights of all landowners as they pertain to groundwater – the District's rules don't. The District's mission statement even reveals that their interest is "...to protect groundwater users..." -

The Post Oak Savannah Groundwater Conservation District (POSGCD) mission is to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and to protect groundwater users, by adopting and enforcing Rules consistent with state law.

Disturbingly, the District's brief indicates that they have now changed their mission to include "...provide water for the State of Texas..." (Page 1) which supports my contention that their only interest is enabling big pumpers. The District is not acting in the community's best interests.

The District's rules disregard the property rights of two large groups of landowners: 1) landowners who don't pump their groundwater because they want to conserve it; and 2) landowners who don't want to lease their groundwater rights and either only have exempt wells or don't pump their groundwater because they purchase water from water suppliers.

Texas Water Code 36.002 (a) powerfully states: "The legislature recognizes that a landowner owns the groundwater below the surface of the landowner's land as real property." There is no conditional phrase attached to this law stating, "Only if the groundwater is pumped in significant amounts."

In fact, HB 4112 was passed in 2015 to ensure that the law was interpreted to protect the rights of landowners who elect not to pump their groundwater. The Senate Research Center's analysis of the bill states: "H.B. 4112 amends the Water Code to establish that the groundwater ownership and rights recognized by the legislature entitle a landowner, including a landowner's lessees, heirs, or assigns, to have any right recognized under common law and not just the right 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."

To understand how the District's rules do not honor most landowners' private property rights, let's consider the fact that one water marketer was granted permits to pump 71,000 acre-foot/year of Simsboro and Carrizo groundwater - an amount exceeding modeled available groundwater (MAG) for both aquifers (See Table 8-1 of District's management plan). The District saw fit to approve this excessive amount of pumping permits even though the water marketer's groundwater leases represented less than 5% of the land within the District.

What does this situation mean to the remaining landowners? Based on GAM runs, the water marketer's pumping will cause significant drawdowns of water well levels across the entire District which even the District says will require pumping permits to be cutback within 15 years (*Texas Tribune – 13 August 2014*). Consequently, most of us will watch our groundwater levels drop while a water marketer and an estimated 500 people will be paid for selling our groundwater without our permission and without compensating us for the loss of our groundwater. This cannot be characterized as rules protecting private property rights.

In striking contrast, other groundwater districts' rules protect the property rights of all landowners – not just those who want to pump their groundwater. Two of those groundwater districts are Guadalupe County and Kenedy County GCDs. Guadalupe County GCD determines production limits by assigning an amount of groundwater to each property based on the percentage of an aquifer below that property. And Kenedy County GCD's rules determine production limits for non-exempt wells by dividing MAG by the District's total acreage. These GCDs' rules were the basis for the Petition's concluding notes (*Page 15*).

The rules of these two groundwater districts not only protect private property rights of all landowners, they protect the aquifers by ensuring that DFCs will not be exceeded. In contrast, the District's rules only protect the rights of those landowners who pump their groundwater.

The District's rules have created an inequitable environment which does not protect the private property rights of the large majority of landowners as they advertise - but instead penalizes those who don't pump their groundwater.

State's Preferred Method of Groundwater Management

The phrase "state's preferred method of groundwater management" is repeated frequently in the response briefs.

This phrase does not confer infallibility upon groundwater districts.

Sustainability

In their brief, the District repeatedly states that their rules ensure that groundwater will be produced on a sustainable basis. Yet, they adopted DFCs which do not support that statement. For example, the District's DFC for the Simsboro Aquifer is an average drawdown of 300 feet by 2059 – a decision which is accurately described as 'managed depletion' (*See Table 7-1 of the District's management plan for DFCs*).

No one can say that overpumping an aquifer to the extent that the artesian pressure drops an average of 300 feet is sustainable use of that aquifer. Instead, the overpumping is called 'aquifer mining' because the pumping exceeds the aquifer's recharge and will ultimately deplete the aquifer's stored groundwater (*Excerpted from Blanco-Pedernales GCD Rules*).

California is a real-time example of where the District is heading by its adoption of a 300-foot drawdown DFC. California's aquifers were extensively depleted because of being overpumped for years - this year they acted to try to save the aquifers by passing laws requiring withdrawals to equal recharge.

The District's adoption of a 300-foot drawdown DFC for the Simsboro Aquifer will specifically harm Milam County because the aquifer's outcrop/shallow-end is within Milam County. An average 300-foot drawdown could cause most if not all Milam County Simsboro wells to go dry since their water columns only average 235 feet.

Historic Use Wells

The Petition emphasized that there are no District rules which address how to reduce the pumping of historic use wells when aquifers reach red-flag levels. This is an important omission since historic use wells account for 36% of the issued pumping permits.

The only part of the District's brief which addresses my concern is Footnote 17 which states "Historic Use Permits will gradually diminish away..."

The absence of rules addressing the management of historic use wells will not allow the DFCs to be achieved and definitely does not protect our groundwater.

District Says Permittees Will Cutback their Pumping When Asked

The District likes to assuage people's fears about the District's overpermitting by stating that they have the authority to reduce the permitted volumes that they have approved. They usually stop at that point – and people feel better.

What they don't tell people is that the same landowner or water marketer who had their permits cutback can simply walk into the District's office and request new pumping permits to make up for the groundwater pumping lost due to the initial cutbacks. That part makes people nervous and prompts the question: "How does that stop the aquifer drawdown?" I answer that question by saying, "It doesn't."

Rule 16.7 provides for the cutback in permitted volumes (*See Appendix 1*). In the Petition, I stated Rule 16.7 is ineffective – but failed to mention that the example provided in Part 2 of the Petition illustrates why it is ineffective (*Page 11*).

The District's brief emphasizes repeatedly that they have the right and authority to cutback the "permitted" amounts up to 2% per year after Threshold Level 3 is reached (*Page 10*). Threshold Level 3 is reached when the average drawdown of monitoring wells reach 95% of the DFC (*Rule 16.4 – Appendix 1*).

In their brief, the District even included a letter from the District's major water marketer (*Blue Water Systems – Exhibit N*) and a San Antonio Water System (SAWS) statement as evidence that they recognize the District's authority to reduce permitted production (*Page 10*).

SAWS has a contract to purchase 50,000 acre-feet/year of Simsboro and Carrizo groundwater produced from a well-field in southwestern Burleson County – the project is named Vista Ridge Regional Water Supply Project which is a partnership between Abengoa and Blue Water Systems.

Although the District cited Blue Water Systems and SAWS in their brief, they apparently haven't talked with Abengoa; the principal company of the Vista Ridge Project. Abengoa is not as quick to allow their investment to be compromised by the District cutting back their groundwater production.

I learned about Abengoa's plans from a document I received in response to a 2014 Public Information Request. The document was a redacted copy of the 2013 Abengoa/Blue Water Systems proposal to supply Burleson County groundwater to SAWS/San Antonio.

One of the proposal's letters (*See Appendix 2*) provided eye-opening insight about what Abengoa plans to do if the District attempts to prevent them from pumping their permitted 50,000 acre-feet/year of groundwater. The pertinent excerpt from the Abengoa letter is below:

"Even so, were the impact of such changes to not be fully mitigated by the Abengoa team's excess leasehold position, we believe that Groundwater Management Area 12 and the Texas Legislature would recognize and protect the substantial, investment-backed expectations of Abengoa and the community of San Antonio.

Additionally, although unlikely to be needed, the courts would provide a substantial backstop to the long-term success of the Vista Ridge Project. As the Texas Supreme Court recently affirmed, groundwater in Texas is private property. Blue Water has already invested tens of millions of dollars in POSGCD fees, landowner bonus and royalty payments, infrastructure costs in developing its groundwater rights, permitting water from POSGCD, and building infrastructure for the 130 Project. Even greater sums are necessary for development of the Vista Ridge Project, and so the project would involve substantial investment-backed expectations in development and use of vested private property rights for development of a public good, namely, a reliable groundwater supply for citizens and businesses of San Antonio. The Texas Constitution provides important limits on any regulatory changes that would detrimentally impact the private property rights in the Vista Ridge Project."

I do not believe that Abengoa will be going quietly into the night if the District prevents the pumping of their permitted 50,000 acre-feet/year of groundwater. Yet, the District continues to tell people that everyone accepts that they can be cutback when the aquifers start dropping due to overpumping and overpermitting (*See Page 10 – District's Brief*).

I also believe that others with significant infrastructure investments predicated on the original permitted volumes will be running either to Austin for legislative help or to the courts if the District's actions actually reduce the amount of groundwater that they can pump.

The origin of this real threat of permittees using the courts and Legislature to render our aquifers unusable can be imputed to the District's extreme overpermitting which they say the rules allow. I and the TCEQ Office of Public Interest Counsel do not believe that the District has the right to over permit since Texas Water Code 36.1132 (b) requires the District to consider five factors when deciding whether to issue pumping permits - including MAG and the amount of approved pumping permits. The TCEQ Office of Public Interest Counsel's brief said it best: "As currently written, the District's rules fail to provide sufficient consideration to the mandatory factors in Texas Water Code 36.1132(b) that the law compels them to consider" (*Page 7*).

This is the “train wreck” that other groundwater districts have said will be caused by the District’s rules – where wealthy corporations and people use their financial and political clout to compel the District to honor the originally permitted amounts. If the District had not chosen to adopt rules which they say allow overpermitting – the future “train wreck” wouldn’t even be a discussion point. I argue that the “train wreck” will translate into our aquifers being depleted, DFCs being exceeded, and Milam County’s access to groundwater being especially curtailed.

“Approve all Permits” Policy

This section provides a short review of the Petition’s main foundation for my assertion that the District’s rules fail to achieve the DFCs and do not protect our groundwater.

The previous section details the District’s rules and plans for responding to the breaching of Threshold Level 3. Threshold Level 3 for the Simsboro Aquifer will be reached when the average drawdown of Simsboro monitoring wells is 285 feet (95% of the Simsboro DFC).

When the District starts cutting back permitted amounts of pumping in response to Threshold Level 3 being reached, the Vista Ridge Project will start submitting requests for new pumping permits using their “excess” groundwater leases which roughly equal 35,000 acres. It is important to note that Abengoa/Blue Water Systems based their entire \$3.4 Billion project proposal on the premise that the District “approves all permits” even when the DFCs are almost reached (*See Vista Ridge Quote - Petition Page 15*).

More evidence that someone has convinced Abengoa that this is the plan is clearly presented in the first paragraph of the Abengoa letter excerpt included in the previous section, which states that Abengoa expects to be “fully mitigated” by their “excess leasehold position.” This means that they expect the District to fully approve their requests for new pumping permits based upon their unused “excess” groundwater leases in order to continue pumping 50,000 acre-feet/year of groundwater.

Although the District uses such phrases as “the District will generally issue appropriate permits” in their brief (*Page 4*), their “approve all permits” rules are clearly described in their brief at multiple locations including:

- “The Rules further allow landowners to obtain new permits after a reduction in the volume of production permitted per acre of land overlying an aquifer, or within a specific Management Zone, even though the additional permit may result in a further reduction of the production authorized by previously issued permits” (*Page 4*).
- “The ability of the District to: a) reduce existing production authorized by previously issued permits by two (2) percent annually; and b) issue all subsequent permits to authorize the production of the lowered number of acre-feet/acre would seem sufficient to enable the District to comply with the DFCs” (*Page 10*).

In addition to their automatic approval of new pumping permits thwarting the District's efforts to prevent aquifer depletion, an additional complication is that the District will be cutting back the "permitted" volumes instead of the amount pumped. The District's general manager explains that most permittees only pump 40% of the "permitted volumes." This means a Rule 16.7-authorized cutback in the "permitted" volumes will have absolutely no effect on the actual pumping of many wells for an undetermined length of time and will not protect our groundwater.

The District's rules will not prevent the declines in the water well levels because of their plan to continue issuing new pumping permits after Threshold Level 3 is reached.

Monitoring Well Updates

While the Petition focused on how the District's continuation of their "approve all permits" policy even after Threshold Level 3 is reached will prevent the DFCs from being achieved, the District's brief focused on their monitoring wells.

In addition, the briefs from Fayette County GCD, Brazos Valley GCD, and the TCEQ Executive Director repeatedly state how the District's monitoring well network will allow success in achieving the DFCs and protecting the groundwater.

In order to reply to the respondents' briefs, I had to study the monitoring network. The results were surprising and are presented below.

The District's primary argument is that the monitoring network is superior to groundwater models and MAGs for achieving the DFCs because the network's wells "monitor actual water levels within aquifers." They reported that there are 88 monitoring wells and that a 2015 Monitoring Well Report is available on the District's website.

Monitoring wells play critical roles for determining when the District takes action in response to aquifer depletion since their average drawdowns constitute five of the eight trigger points for determining when Threshold Levels 1, 2, and 3 are reached (*Rule 16.4 – Appendix 1*).

The District's brief also highlights that "The Board regularly reviews the number, location, operation and increase of the monitoring wells and receives an annual report on the measured water levels" (*Page 9*). The District's minutes of the monitoring well updates presented to the board on 9 April 2013, 10 June 2014, and 14 April 2015 did not contain mention of any concerns about monitoring well drawdowns or threshold levels being reached.

During the 2013 and 2014 monitoring well update presentations, the same summary slide was presented which did not note excessive drawdowns or thresholds being reached (*See Figure 1*).

Aquifer	Zone	Number of wells	Water Levels				Typical drawdown (ft) Notes
			1990	2003	2011	2014	
Hooper	Shallow	6	354	401	239	162	relatively constant, most wells dropping ~5 ft.
Smushone	Shallow	12	309	471	212	259	relatively constant, most wells dropping ~2-10 ft, a couple dropped >10 ft
Smushone	Deep	17	248	328	116	212	some wells dropping, but several raising as much as 30 ft.
Caldwell Bluff	Shallow	5	329	411	254	158	Adjusted results, No apparent trend
Carrizo	Shallow	4	330	458	268	190	relatively constant, mostly dropping ~2-6 ft.
Carrizo	Deep	4	303	319	273	46	relatively constant, mostly dropping ~2-6 ft.
Queen City	Shallow	5	299	352	251	181	relatively constant, a couple wells dropping ~10 ft.
Queen City	Deep	3	302	321	291	50	need more data, but trending downward
Spinta	Deep	7	251	294	173	121	relatively constant, mostly dropping no more than ~10 ft.
Yegua-Jackson		3	209	220	199	22	Adjusted results, No apparent trend
Brazos River Alluvium		7	210	246	172	74	Relatively constant, dropping ~10 ft.

***Note: Data is preliminary and needs to be checked and verified**

Figure 1: Summary slide for the 2013 and 2014 monitoring network annual updates

Problems with the Monitoring Network

In contradiction to the monitoring network updates discussed in the previous section, the Brazos Valley GCD brief states: “Recently, the Post Oak Savannah GCD responded to a detrimental effect to the Yegua-Jackson aquifer and existing wells due to an increase in groundwater production, which was indicated by its well monitoring” (Page 2). A similar statement was made on Page 1 of the Brazos Valley GCD’s brief.

Figure 2 displays the Yegua-Jackson monitoring well graph reported to the board in April 2015. The Yegua-Jackson Aquifer’s DFC is a 100-foot drawdown by 2059.

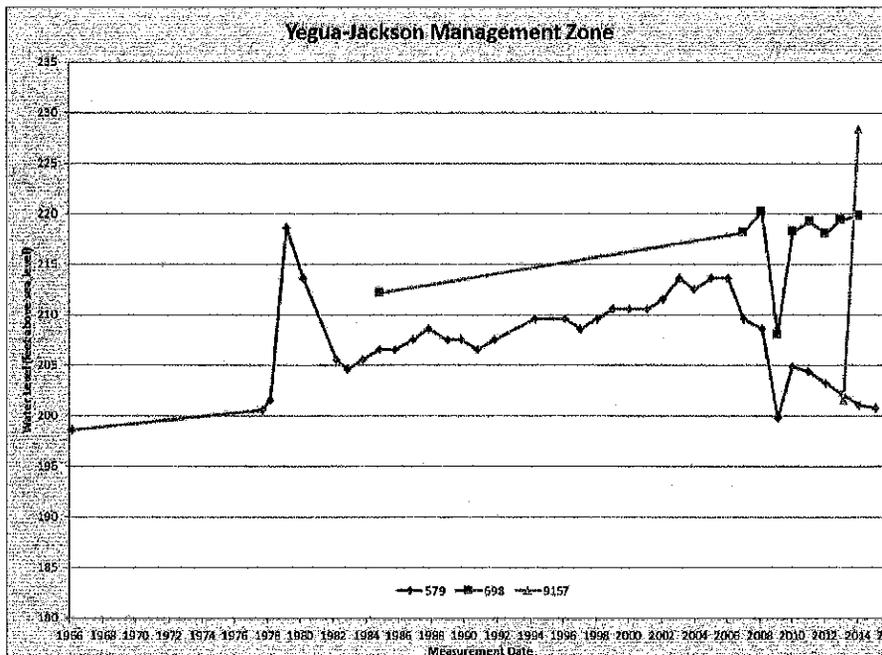


Figure 2: The Yegua-Jackson monitoring well graph presented to the District’s board on 14 April 2015

I cannot explain why Brazos Valley GCD's brief stated the District acted "in response to its well monitoring" for the Yegua-Jackson Aquifer; the data do not provide a reason for taking action.

In addition to the Yegua-Jackson graph, I studied the other monitoring well graphs presented to the District's board on 14 April 2015 – that report can be accessed on the District's website. An overview of the monitoring wells and their locations within the District's shallow and deep aquifer management zones is also available on the District's website (*click 'monitoring maps'*).

Although a major theme of the respondents' briefs was the District's "robust" and "comprehensive" monitoring network, my study of the 14 April 2015 District Monitoring Well Update provided evidence that the monitoring network has critical failures and that no one had analyzed the monitoring data.

The monitoring well data for the Simsboro and Carrizo shallow management zones were studied next because of the Petition's focus on the extreme overpermitting of these two aquifers: pumping permits exceed MAG-2020 by 169% and 294% for the Simsboro and Carrizo Aquifers, respectively (See *Petition Figure 2*).

The graph of the Simsboro shallow management zone presented to the board in April 2015 is displayed in Figure 3.

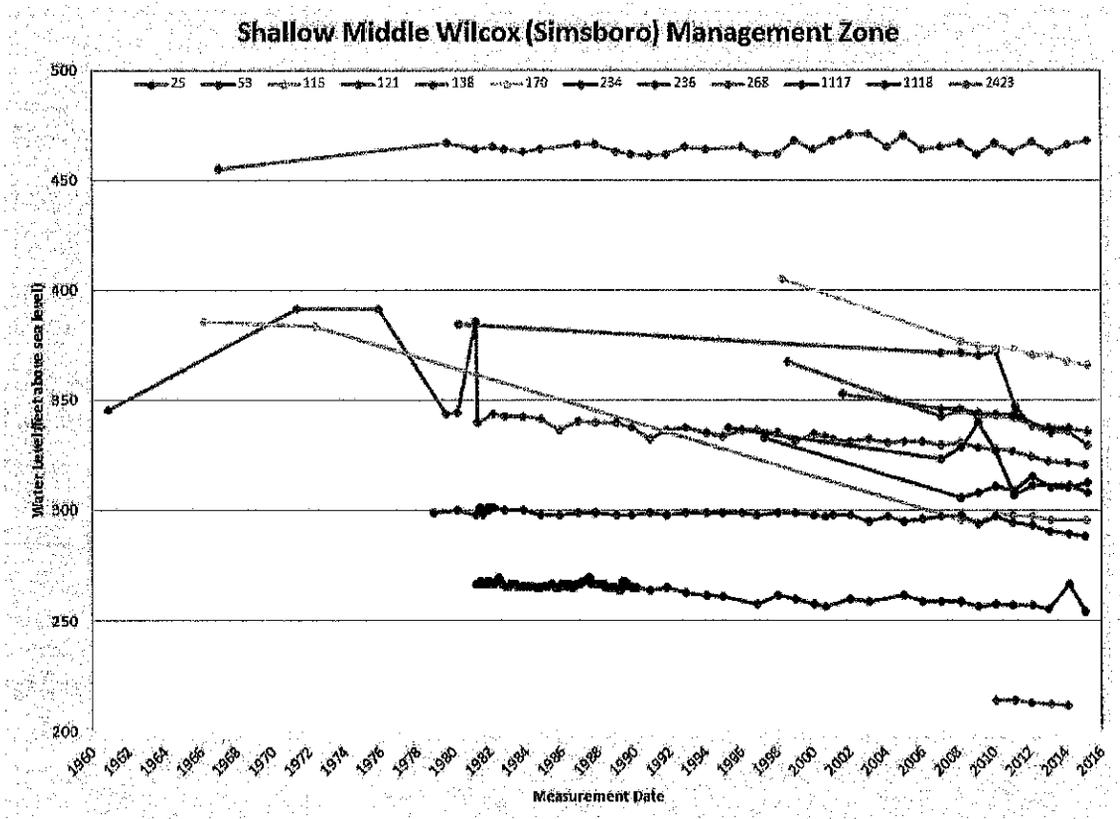


Figure 3: The Simsboro shallow management zone monitoring well graph presented to the District's board on 14 April 2015

Although a general downward trend in water levels can be noted for the Simsboro shallow management zone, the graph’s scales preclude accurate determination of the drawdowns. Without that information, one cannot determine if the threshold levels have been reached.

For this management zone, the overall threshold value is a 20-foot drawdown from 2000 to 2059 (See Table 7-3 of the District’s management plan). Threshold Level 1 is triggered if the drawdown reaches 60% of the threshold value (a 12-foot drawdown). While Threshold Level 2 is triggered if the drawdown reaches 80% of the threshold value (a 16-foot drawdown).

In order to accurately determine the drawdowns, I constructed graphs for individual wells using the same TWDB water level data as used by the District to construct their graphs.

Appendix 3 contains a list of the monitoring wells which allows the conversion of the District well numbers to TWDB well numbers.

While searching the TWDB data files for the water levels, I discovered reasons to delete six of the 12 monitoring wells shown in Figure 3 from my analyses (See Table 1).

Table 1: Simsboro Shallow Management Zone Wells either Analyzed or Deleted from My Analyses

<u>Well Number</u>	<u>Disposition</u>	<u>Reason for Deletion from Simsboro Analysis</u>
25 (5917409)	<i>Deleted</i>	A Hooper Aquifer well according to TWDB
53 (5909901)	Analyzed	
115 (5917715)	<i>Deleted</i>	This well’s recording in Figure 3 is actually the recording of two different wells (5917715 and 5917708)
121 (5917714)	Analyzed	
138 (5917713)	Analyzed	
170 (5824914)	Analyzed	
234 (5902309)	<i>Deleted</i>	This well’s water levels have not varied statistically for 34 years possibly due to its location under the Brazos River Alluvium.
236 (5902307)	Deleted	A Wilcox Aquifer well according to TWDB
268 (5832101)	<i>Deleted</i>	A Hooper Aquifer well according to TWDB
1117 (5917712)	Analyzed	
1118 (5917711)	Analyzed	
2423 (5902904)	Deleted	Not enough recordings - first recording taken in 2010.

NOTE: Wells are identified with the District number and TWDB number in parentheses

I do not know why the District and TWDB listed different source aquifers for three of the wells in Figure 3. These mistakes are even more difficult to explain by the fact that the District has been measuring the well depths for TWDB since 2006.

When I found the source aquifer identification problems, I contacted TWDB's groundwater technical assistance division to inquire about how difficult it is to distinguish the different aquifers. They replied that it is not difficult. For an example, they said to differentiate the Simsboro and Hooper; it is as simple as differentiating sand (Simsboro) from mud (Hooper).

I was unable to analyze the Carrizo shallow management zone because TWDB identified six of the eight wells as monitoring other aquifers: Calvert Bluff (3), Carrizo/Calvert Bluff (1), and Simsboro (2).

The only TWDB-identified Carrizo well in the Carrizo shallow management zone [9167 (5918109)] had a 21-foot drawdown between 2012 and 2014. The threshold value is a 20-foot drawdown for the Carrizo shallow management zone, yet it took this one well only three years to surpass that threshold value. This significant drawdown was not mentioned in the monitoring network updates.

Because of the source aquifer mistakes found for the Simsboro and Carrizo management zones, I checked the source aquifers of the monitoring wells listed for the other aquifers. My survey revealed that the District and TWDB identified different source aquifers for 19 monitoring wells. These wells are identified in *Appendix 4* along with the supporting TWDB raw data.

I know of no valid excuse/reason for having 19 monitoring wells that appear to be measuring water levels in aquifers different from those identified by the District. It doesn't matter what excuse the District provides, the fact is that the District didn't even know that TWDB reports those 19 wells as monitoring aquifers different from those identified by the District. The rules must be changed to prevent monumental failures such as not knowing what your monitoring network is monitoring.

I assert that if the source aquifer errors were never discovered and TWDB's source aquifer identifications are correct, the District's monitoring network would not have succeeded in protecting our aquifers. And the District cannot enforce substantial compliance with many of its rules if the monitoring network's failures prevent important rules from being activated.

This whole situation is incomprehensible to me and needs to be fully investigated by an outside agency. These major errors cannot be allowed to happen when dealing with the futures of two counties and the people living in those counties.

Threshold Levels 1 and 2 Have Been Reached for Simsboro Shallow Management Zone

The shallow management zones are of great importance to the District as indicated by the following statement in their brief: "District's development of shallow DFCs for each aquifer is based on sound science and enforceable. These shallow DFCs are even more protective of the aquifer than the overall GMA 12 adopted DFCs" (Footnote 32).

The District's general manager has also proclaimed that the shallow management zones will protect wells from being depleted and is quoted as saying in 2014: "The bottom line is that the District is carefully watching the impact on the shallow areas" (Exhibit O - District's brief).

To my total surprise and great concern, a simple analysis of the monitoring well data revealed that Threshold Levels 1 and 2 have been reached in the Simsboro shallow management zone and in other shallow management zones.

Figure 4 displays the results of my analyses of the Simsboro shallow management zone. In addition, I have provided the individual graphs for the six wells and the supporting TWDB raw data in Appendix 5.

The analyses provide evidence that the average drawdown has already equaled the 20-foot threshold value which means Threshold Levels 1 and 2 (set at 60% and 80% of the threshold value, respectively - Rule 16.4) have also been exceeded.

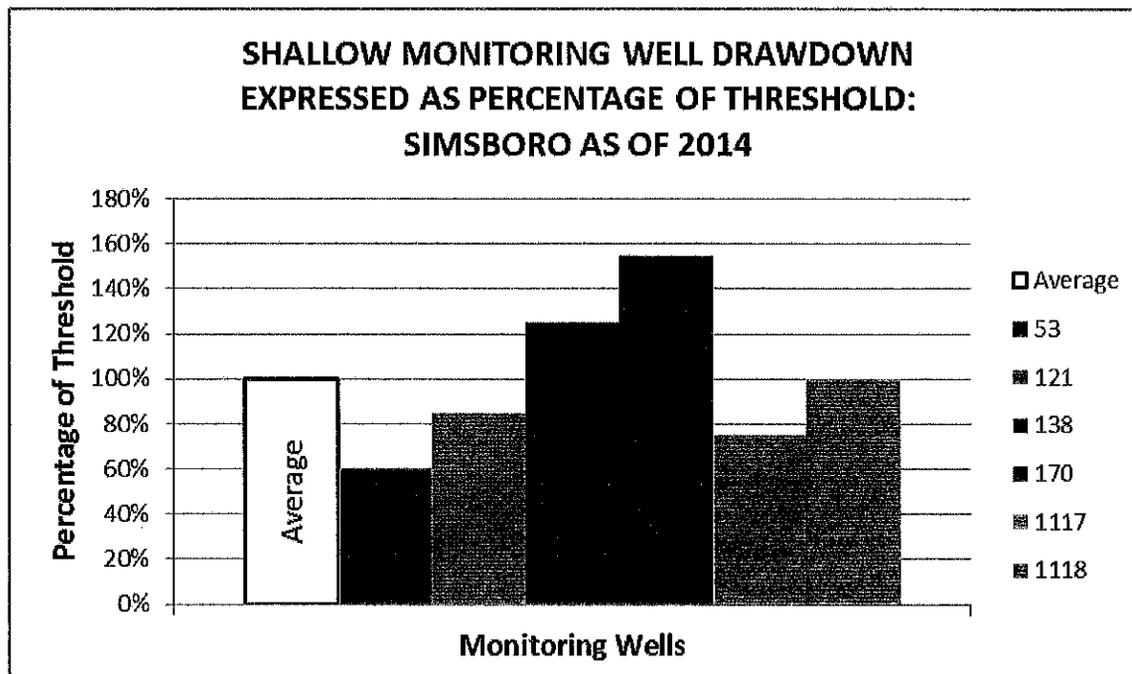


Figure 4. The drawdowns of six monitoring wells in the Simsboro shallow management zone expressed as percentage of the threshold value which is 20 feet in the year 2059. The wells are identified according to the District identification numbers used in Figure 3 which displays the graphs of their recording data.

Even if you include the three monitoring wells deleted from the analysis because TWDB's database indicates that they are not monitoring the Simsboro (*See Table 1*), the drawdown average still exceeds Threshold Level 2.

No one from the District alerted the community that Threshold Levels 1 and 2 for the Simsboro shallow management zone had been reached. And it appears that no one alerted the District's board even though they were presented with annual monitoring network updates. In fact, the 2013 and 2014 PowerPoint presentations contained summary slides describing the Simsboro shallow management zone as: "relatively constant, most wells dropping 2-10 ft, a couple dropped greater than 10 ft." While in reality, two monitoring wells dropped 30 feet since 2000.

Based on the above evidence, I conclude that no one from the District has taken the time to analyze the data provided by the monitoring wells – no one has taken the time to determine if the Simsboro was actually the aquifer being monitored – and no one understood that Threshold Levels 1 and 2 had been reached.

These failures are not isolated to the Simsboro shallow management zone. A summary of my findings for the other shallow management zones is included as *Appendix 6*. The same critical errors occur in the other shallow management zones: 1) source aquifers misidentified, and 2) threshold levels reached without anyone noticing.

The failure to identify that the threshold values had been reached could be assigned to the fact that the rules do not identify who is responsible for analyzing the results instead of just adding points to a graph. The management plan only states: "The monitoring of the wells will be performed under the direction of the general manager, by trained personnel using a Standard Operation Procedure adopted by the District." The person responsible for analyzing the data is not mentioned.

These failures reveal that the District's talk about the importance they place on the shallow management zones is nothing but talk. They know that people in Milam County fear what is going to happen to them when the big pumping of the Simsboro and Carrizo Aquifers starts since Milam County is over the shallow end of all the aquifers– so they talk a lot about how the "District is carefully watching the impact on the shallow areas."

But the end-results of the District's failures as discussed in this reply brief will be more than just "talk." Because the warning signs of precipitous drawdowns were not detected earlier by the District, Milam County's future is dimmer. And add to that the ominous implications of Threshold Level 2 already being reached for the Simsboro and Hooper shallow management zones although the Vista Ridge Project's big pumping won't even start until 2019.

Instead of the District's rules only suggesting more aquifer studies should be performed when Threshold Levels 1 and 2 are reached, the rules need to require cutbacks in pumping in order to protect Milam County. Waiting for Threshold Level 3 "...may be too little, too late" as stated in the TCEQ Office of Public Interest Counsel's brief (*Page 8*).

Because of the District's almost total dependence on the monitoring network to trigger the activation of rules linked to the threshold levels, the District has to have a credible monitoring network shepherded by someone assigned to analyze and think about the data – they have neither.

The Petition highlighted that a critical omission in the rules was that “the person responsible for tracking the different thresholds mentioned in Rule 16.4 and the person responsible for initiating action” were not identified (*Page 10*). This failure of the rules may have led to the present critical failures of the monitoring network.

These failures ultimately result in rules not being enforced because the triggering actions are missing – and this lack of compliance with the rules will prevent the DFCs from being achieved and will not protect our groundwater.

Concluding Notes

The District in their response brief used their monitoring network to redirect attention away from the Petition's legitimate concerns. That decision resulted in my reply brief including a study of the monitoring network which uncovered even more problems with the District's rules and provided enough evidence to question if the District as an institution is qualified to fulfill its legislative mandate to protect and conserve our aquifers. The District's culture of complacency is both unexplainable and unacceptable. The management of our groundwater is serious business.

Somewhere along the road since its creation, the District has lost sight of its mission. The District needs to be investigated and provided a roadmap for reinventing itself as an effective, competent, and responsive groundwater district, instead of the hubristic groundwater district into which it has evolved.

Without the Texas Commission on Environmental Quality approving the Petition for Inquiry, I believe that the aquifers in Milam and Burleson counties will be depleted to the point that future generations will not be able to live here.

As I stated in the Petition for Inquiry's introduction, “I hope that the Texas Commission on Environmental Quality will act to require the District to institute and enforce rules that will conserve and protect our groundwater for future generations.”

Appendices

NOTE: Section 16 of the District's rules.

**SECTION 16.
MANAGEMENT OF WATER AVAILABILITY AND PRODUCTION**

RULE 16.1. MANAGEMENT ZONES. Groundwater availability will be conserved, preserved and protected by well spacing, permit requirements, and/or limiting water drawdown levels within the Management Zones listed in Section 5 of the Management Plan. [Amended June 12, 2012]

RULE 16.2. GENERAL. All permits issued by the District that authorize the production of water shall be subject to the terms, conditions and provisions of this Section 16. All other terms, conditions and provisions of these rules shall be and remain in full force and effect. Any conflict between this Section 16 and any other Rule will be resolved by the Board upon a written request being made.

RULE 16.3. MONITORING OF GROUNDWATER. The District will monitor estimated total annual production, water quality, and the water levels. An analysis of the monitoring data will be reported at least once every three years. If, within a Management Zone, the drawdown based on monitored groundwater levels, or total estimated annual production, or projected average water level drawdowns, reach a threshold established in Rule 16.4, then, as determined appropriate by the Board, the District will give notice to well permittees in the affected Management Zone(s) as provided in Rule 16.4. The District will take action as found appropriate by the Board, based on the analysis of measured water levels, projected average water level drawdowns, permitted production, current and projected total estimated annual production and relevant hydrogeologic and water resource information including, but not limited to surface water availability and drought conditions, and review and evaluate the current and predicted water availability. The District may reduce both the maximum acre feet of water per acre of land for which the District may issue a permit and/or the volume of water authorized to be produced under any permit issued by the District for a Management Zone, as a result of the groundwater availability, total estimated annual production, or groundwater level drawdown within a Management Zone. The District may also adopt rule changes for a Management Zone if production in that Management Zone is shown to adversely impact groundwater conditions in another Management Zones. [Amended July 12, 2005] [Amended June 12, 2012]

RULE 16.4. ACTIONS BASED ON MONITORING RESULTS. Monitoring and threshold levels will be used to initiate appropriate responses designed to help achieve the DFCs, conserve and preserve groundwater availability and protect groundwater users. Three threshold levels are adopted to help guide these actions. Each threshold level provides for an increased level of response based on the change in production or water levels associated with a Management Zone. The threshold levels are: Level 1; Level 2; and Level 3. [Amended June 12, 2012]

1. Threshold Level 1. Threshold Level 1 will be reached, and additional study and investigation may be undertaken as appropriate, at such time as: [Amended June 12, 2012]

- a. Total estimated annual production is greater than 70% of the Modeled Available Groundwater (MAG) value listed in Section 8 of the Management Plan;
- b. An average groundwater drawdown, calculated from monitored water levels for an aquifer, is greater than 60% of the average groundwater drawdown adopted as a DFC for that aquifer in Section 7 of the Management Plan;
- c. An average groundwater drawdown, calculated from monitored water levels, for a Shallow Management Zone is greater than 60% of the threshold value for average drawdown in that Shallow Management Zone listed in Section 7 of the Management Plan; or
- d. Projected average water level drawdowns, calculated with a District approved methodology, indicate that a DFC for 2060 that is listed in Section 7 of the Management Plan will be exceeded within 15 years.

2. Threshold Level 2. Threshold Level 2 will be reached, and a review of the Management Plan, rules and regulations may be initiated, at such time as: [Amended June 12, 2012]

- a. Total estimated annual production is greater than 85% of the Modeled Available (MAG) value listed in Section 8 of the Management Plan;
- b. Average groundwater drawdown, calculated from monitored water levels, for an aquifer is greater than 80% of the average groundwater drawdown adopted as a DFC for that aquifer in Section 7 of the Management Plan; or
- c. An average groundwater drawdown, calculated from monitored water levels, for a Shallow Management Zone is greater than 80% of the threshold value for average drawdown in that Shallow Management Zones listed in Section 7 of the Management Plan;

3. Threshold Level 3. Threshold Level 3 will be reached, and the Board will consider amendments to the Management Plan rules and regulations at such time as an average groundwater drawdown, calculated from monitored water levels, for an aquifer is greater than 95% of an average groundwater drawdown adopted as a

DFC for that aquifer in Section 7 of the Management Plan. [Amended June 12, 2012]

4. The threshold levels will be administered and applied separately to each Management Zone. As part of the evaluations and determinations, the District will consider the pumping-induced impacts to groundwater resources that occur between or among management zones. The evaluation will determine if pumping or production in one management zone is contributing to adverse impacts to groundwater conditions in another management zone. [Amended June 12, 2012]

a. If Threshold Level 1 is exceeded, the District may consider performing studies to provide information on aquifer properties, aquifer recharge, aquifer and surface water interactions, and aquifer pumping. The results may be used to improve the models, tools, and methodologies used to analyze data and predict future groundwater levels and availability.

b. If Threshold Level 2 is exceeded, the District may re-evaluate the Management Plan and rules regarding management zones, recharge estimates, the collection and analysis of monitoring data, and proposed changes to DFCs for consideration in the joint planning process.

c. If Threshold Level 3 is exceeded, the District will conduct a public hearing to discuss the status of the aquifers and develop a Level 3 Response Action Work Plan focused on achieving the District's goals and objectives, including the DFCs. The work plan will be completed within 6 months after the first public hearing and will be made available to the public through the District's web site.

i. The notice will include the cause for the notice, the fact that an additional review, evaluation and study is being made, and that a reduction of the maximum allowable production per acre and/or the permitted production may be approved following the review and evaluation. [Amended July 12, 2005]

ii. The general manager, in consultation with the district geohydrologist, will review and evaluate the permit applications pending, the permits issued and the records of the District, any estimates of total production by exempt wells, and increase the frequency or locations of water drawdown monitoring within the Management Zone. If the notice is due to the average drawdown based on monitored water levels then an evaluation of the reasons for the drawdown will be included in the review. [Amended July 12, 2005] [Amended June 12, 2012]

iii. The general manager will promptly report to the Board that notices have been, or are being, given and the event that required the notice to be given. The general manager will advise the Board of the plan for review and evaluation recommended under (b) and, if the plan will be implemented over a period of

more than one month, during the evaluation, review, study and any additional monitoring period, the general manager will keep the Board advised of the progress of the review and evaluation. Upon completion of the review, evaluation and any additional monitoring, the general manager and district geohydrologist will make a final report to the Board, together with their recommendation for action.

- iv. If the general manager, in consultation with the district geohydrologist, finds the evaluation, study, review and/or monitoring supports a recommendation that an adjustment of permitted production is recommended for a Management Zone or another Management Zone in which threshold level 3 was reached, the recommendation shall be consistent with the finding and provide supporting documentation for the limitation. [Added July 12, 2005] [Amended June 12, 2012]
- v. The general manager may, after consultation with the district geohydrologist and in combination with or in addition to the above, recommend any action or combination of actions set forth in Rule 16.4. [Amended June 12, 2012]

5. The terms, provisions and the actions provided for in this Rule 16.4 are in addition to and not in lieu of the terms, conditions and provisions of any other rule or provision of this Section 16. This rule does not limit the authority of the Board to act pursuant to any other rule. The Board shall have the discretion to take any action authorized by this Section 16. [Amended June 12, 2012]

RULE 16.5. REDUCTIONS REQUIRED BY REGULATORY ACTION. Notwithstanding any other term or provision of these rules, the Board may proportionately reduce the maximum amount of water that may be permitted per acre and volume of water authorized to be produced under any permit issued by the Board, and may adjust the thresholds established in Rule 16.4, as required by state law or by a regional plan or an area or regional agreement mandated by state law and which, by authority of state law, requires water availability or production to be limited or regulated based on water availability within a geographic area that includes land in more than one groundwater conservation district. In the event permitted production or water level drawdown will be reduced by reason of any such state law or regulation, the District will give notices as provided in Rule 16.4, hold one or more public hearings on the resulting limitations, and, to the extent permitted by state law, or the regional plan or agreement, implement any such reductions in a manner and over a period consistent with this Section 16. [Amended June 12, 2012]

RULE 16.6. ADJUSTING MAXIMUM PRODUCTION PERMITTED. The maximum groundwater production permitted per acre, the permitted production under any permit issued by the District, and the water drawdown level for a Management Zone may be adjusted as follows: [Amended July 12, 2005]

1. If the water drawdown level within a Management Zone, or in an adjacent zone in which the water drawdown level is impacted by production in such Management Zone, exceeds the water drawdown Threshold Level 3 in Rule 16.4, the maximum water production permitted per acre for the Management Zone and the water authorized to be produced under any permit

issued by the District for that zone may be reduced. The required reduction will be determined by the Board based on the evaluation and the evidence received by the Board. The production in one Management Zone may be reduced to the extent that production in that Management Zone is impacting water drawdown levels in another zone. [Amended July 12, 2005] [Amended June 12, 2012]

2. The maximum allowable production of 2 acre feet of groundwater per acre of land, provided in Rule 5.1.2, may be reduced, and the maximum allowable production may be established or reduced for any one, or more than one, Management Zone(s). [Amended July 12, 2005]
3. Production authorized under permits issued by the District for any Management Zone may be reduced on a schedule to, when considered together with future permits for which the authorized production per acre will be at the lower maximum allowable production per acre, generally over a period not to exceed 40 years, reduce groundwater production by an amount required to return the water level in the Management Zone to levels deemed acceptable by the Board based on evidence provided by the general manager, in consultation with the district geohydrologist. [Amended July 12, 2005] [Amended June 12, 2012]
4. The Board may adjust permitted production within a Management Zone, based upon the results of a review, evaluation, study, and monitoring, and any evidence presented at a public hearing, if it finds the adjustment is appropriate. [Amended July 12, 2005] [Amended June 12, 2012]

RULE 16.7. PERMIT LIMITATIONS AND REDUCTIONS. The maximum allowable production of water authorized by a permit may be limited, adjusted and reduced as follows:

1. If the maximum allowable production of 2 acre feet of groundwater per acre of contiguous land is reduced for a Management Zone, or if any such reduced maximum of allowable production is thereafter reduced again, a new permit may not be issued for the production of more water than is established under this Section 16 as the maximum allowable production of water per acre of land for the Management Zone; [Amended June 12, 2012]
2. Excluding production authorized by a historic use permit, and production authorized by wells exempt under Rule 7.10(1), the production of water authorized by any permit issued by the District for the production of water is subject to limitation, adjustment and reduction;
3. The volume of water authorized by permit to be produced in a Management Zone may be reduced by up to two percent per year with the reduction beginning twelve months after a decision by the Board that such reduction is reasonably required for the conservation and preservation of groundwater, or the protection of the aquifer or groundwater users, within the Management Zone; and [Amended June 12, 2012]
4. If the Board finds it is necessary to reduce the maximum allowable production per acre, or the permitted production for any Management Zone, more quickly than is provided in Rule 16.7(3), to preserve and conserve groundwater or protect groundwater users within a Management Zone, or to implement reductions required under Rule 16.5, the Board shall

establish a schedule for a phased reduction in the maximum allowable production or permitted production for the zone. [Amended July 12, 2005]

RULE 16.8. EXCEPTIONS. The following are exceptions to the rules set forth in this Section 16 for the limitation and reduction of production:

1. After a reduction of the maximum allowable permitted production per acre in a Management Zone, the maximum allowable production per acre of land for which a permit may be issued in the Management Zone shall not exceed the maximum allowable production per acre as modified or established under this Section 16; [Amended July 12, 2005]
2. Within the Trinity Zone groundwater availability will be preserved and conserved, and groundwater users will be protected, by well spacing and the maximum allowable production per acre provided in Rule 5.1.2;
3. The Queen City-Sparta and Yegua-Jackson Zones are recharge based zones with relatively low to moderate yield domestic and small municipal wells, and, in lieu of limiting water drawdown levels in this zone, during droughts permitted production may be temporarily reduced to protect groundwater users; and [Amended June 12, 2012]
4. The Board may, in addition to or in combination with any action authorized in this Section 16, take any action authorized in Section 17. [Added June 12, 2012]

RULE 16.9 NOTICE AND HEARINGS. A limitation, adjustment or reduction of the maximum allowable production of water per acre, or of the volume of water authorized to be produced under permits issued by the District, may be adopted by the Board at any time after written notice is given to the permit holders as provided in Rule 16.4 and a public hearing held, for which twenty days, or more, notice of such public hearing is published in one or more newspapers of general circulation in Milam County and Burleson County, Texas.

RULE 16.10. REHEARING. The owner or the operator of a well or well field for which permitted production is being reduced pursuant to this Section 16 may request a rehearing on a decision by the Board to reduce permitted production by more than ten percent in any five year period, or to make a reduction that exceeds two percent in any one year period. Except as otherwise specifically provided herein any such motion for rehearing must be in writing, state the nature of material additional evidence to be presented, and filed in the district office within thirty days after the date of the Board decision that is being appealed. Such rehearing request will not stay or abate the required reduction or production while the request is pending.

Abengoa Water
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Austin, 78746 TX
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ABENGOA WATER

November 23, 2013

VERY
IMPORTANT

Philip C. Campos, Jr. CPA
Director - Contracting
San Antonio Water System
2800 U.S. Hwy 281 North, Ste. 171
San Antonio, TX 78212

Re: Request for Clarification, Vista Ridge Regional Supply Project, Solicitation No: P-11-003-DS Request for Competitive Sealed Proposal (RFCSP) Regarding the Provision and Delivery of Alternative Water Supplies

Mr. Campos,

As requested, please find enclosed Abengoa's response to SAWS' additional questions presented in your letter dated November 11, 2013. Thank you for your continued interest in Abengoa's proposal for the Vista Ridge Regional Supply Project.

Please feel free to contact me by email or at 512.306.0843 if you have any further questions.

Sincerely,

Michael Irlbeck


Director of Business Development
Abengoa Water USA

Encl

"

ABENGOA WATER

Vista Ridge Regional Supply Project Request for Clarification

1. How will Abengoa ensure the total calcium content is adequate to meet SAWS water quality requirement of 100 ppm or more of calcium as CaCO₃ to blend with existing sources?

As requested, Abengoa will attain the SAWS' water quality requirement of 100 ppm of calcium as CaCO₃ by adding lime and adjusting pH with CO₂. Based on simulations using RTW software, a quicklime dosage of 50 mg/L (as pure) and CO₂ dosage of 99 mg/L (as pure) will be required to obtain the required calcium concentration of 100 mg/L as CaCO₃ for the full 50,000 acre-feet per year. The final pH would be 7.30 with a LSI of 0.20 at a saturation pH of 7.4. This treatment solution has now been made part of Abengoa's project solution and the cost associated with such treatment is addressed in the response to Question 6.

2. What is the price of power for the BlueWater 130 Pipeline project?

The Cross County Water Supply Corporation (CCWSC) has an annual contract with Bluebonnet Electric Cooperative to supply power to the 130 Pipeline project. The project currently averages delivery of about 1 MGD and uses an average of approximately 235,000 kWh per month. The current Large Power rate being charged to CCWSC by Bluebonnet is \$0.09 per kWh. Bluebonnet has indicated that, as the 130 project is expanded to full capacity (20 MGD) in coming years, it is expected that a lower power rate will be available as power demand increases.

By comparison, the projected monthly power use by the Vista Ridge Project will average approximately 12,840,000 kWh per month over the 30-year contract period. Such a large, base-load power demand should be eligible for a discounted rate in the range provided in Abengoa's original proposal. Power for the Vista Ridge Project will be supplied by multiple providers, and Abengoa looks forward to working with these providers and SAWS to obtain the most favorable rates.

3. Please clarify whether a change in the Desired Future Conditions (DFC) and Managed Available Groundwater (MAG) would be a regulatory water supply change or failure of the aquifer to supply contracted water quantity.

Abengoa would consider potential changes in the DFC or MAG as regulatory changes rather than failures of the aquifer itself.

ABENGOA WATER

We believe that the Abengoa team's excess leasehold position would prevent or mitigate many types of adverse impacts on the Vista Ridge project from changes in the DFC or MAG. For example, if the DFC were to be modified to allow a lower amount of drawdown for the Carrizo-Wilcox Aquifer in Bureson County and the Post Oak Savannah Groundwater Conservation District (POSGCD) were to respond by lowering the correlative groundwater production right of each parcel to 1.5 acre-feet per acre, the excess leasehold position could be used to meet all demands of the Vista Ridge project.

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Even so, were the impact of such changes to not be fully mitigated by the Abengoa team's excess leasehold position, we believe that Groundwater Management Area 12 and the Texas Legislature would recognize and protect the substantial, investment-backed expectations of Abengoa and the community of San Antonio.

Bingo!

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Additionally, although unlikely to be needed, the courts would provide a substantial backstop to the long-term success of the Vista Ridge Project. As the Texas Supreme Court recently affirmed, groundwater in Texas is private property. BlueWater has already invested tens of millions of dollars in POSGCD fees; landowner bonus and royalty payments; infrastructure costs in developing its groundwater rights; permitting water from POSGCD; and building infrastructure for the 130 Project. Even greater sums are necessary for development of the Vista Ridge Project, and so the project would involve substantial investment-backed expectations in development and use of vested private property rights for development of a public good; namely, a reliable groundwater supply for the citizens and businesses of San Antonio. The Texas Constitution provides important enforceable limits on any regulatory change that would detrimentally impact the private property rights in the Vista Ridge Project.

4. What assurances could you make to SAWS that these "excess" leases would be maintained exclusively for SAWS use if need be?

As part of its original proposal, the Abengoa team has committed exclusive use of 25,000 leased and permitted acres to support the Vista Ridge Project. At a permitting rate of 2 acre-feet per acre, this acreage provides 50,000 acre-feet per year of fully permitted water.

In order to provide SAWS with coverage for potential future changes in groundwater district rules and regulations that may reduce the amount of water for the Vista Ridge Project, the Abengoa team is willing to commit to the Vista Ridge Project a portion of its excess leasehold position equal to 100% of the contract amount; i.e., an additional 25,000 leased acres. The Abengoa team is open to negotiating a reasonably appropriate fee for the commitment of this additional leased acreage.

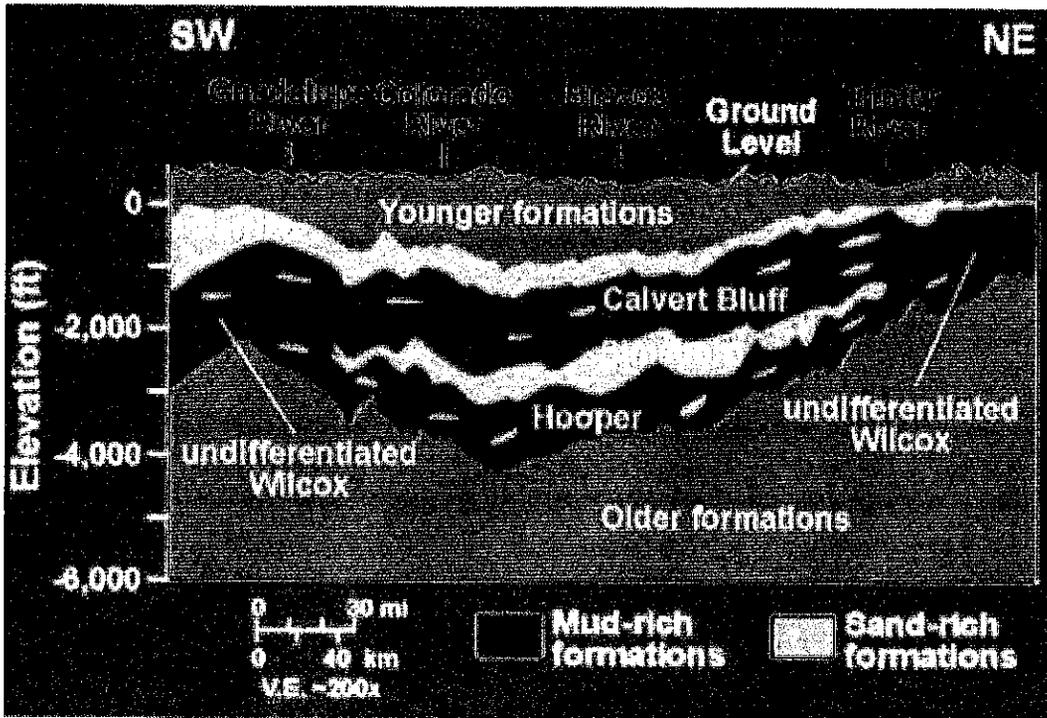
NOTE - THE NEXT ^{FIFTEEN} ~~TWO~~ PAGES
OF ABENGOA'S REVISED
TO SAWS WERE REJECTED.

Case No.	Case Name	Case Description	Case Value	Case Type	Case Date
25	5917409	City of Rockdale (Belton)			
26	5917103	Ralph Summers - Mary Jane Boyd	76.8	Tape	2/18/2015
33	5909901	Richard Frock	114	E-line	2/18/2015
59	5911402	Harold Lange	152.8	Tape	2/18/2015
73	5910907	Willard Karmagay	131.8	E-line	2/18/2015
77	5919108	Charles Hoppa	102.5	Tape	2/28/2015
84	5919302	James Ayers	41.6	eline	2/20/2015
99	5925508	Larry Sexton			
107	5925102	Nosck Family Partnership, Ltd.	120.0	eline	3/6/2015
110	5917713	L.B. Kubliak			
121	5917714	City of Rockdale (Texas)	144.2	tape	3/31/2015
138	5917718	City of Rockdale (Tracy)	147	tape	3/31/2015
170	5924914	Rockdale ISD	128.7	eline	3/31/2015
221	5909605	Marlow WSC	135	E-line	2/18/2015
223	5902705	North Milam WSC	39.4	eline	4/9/2015
234	5902309	Wendy Breck	42.3	E-line	2/19/2015
236	5902907	Phillip & Vicki Harris	127	Tape	2/18/2015
256	5902901	North Milam WSC			
268	5882101	Wayne Diver	5.9	eline	3/26/2015
300	5927719	R. B. Wilkins			
341	5927605	Rudy Steck	98.5	eline	2/20/2015
433	5920410	Milano WSC- Rita Test	29.4	eline	3/25/2015
434	5920409	L. C. Hall, Sr.			
457	5919502	Milano WSC - Well 4	281.7	Tape	3/25/2015
510	5927204	Dale Hill	27.2	eline	2/20/2015
579	5937611	Camilla J. Godfrey	32.8	eline	2/24/2015
596	5937329	Finley Company			
638	5937101	Snook well #1			
681	5938802	Lyons Water Supply	130.5	tape	3/13/2015
698	5943608	Birch Creek Recreation			
787	5938701	Barnes Services, Inc.	18.4	eline	2/20/2015
791	5935208	Juanito Arndson	74.4	tape	2/18/2015
859	5920456	Marion Malazzo	17.1	tape	2/20/2015
860	5929457	Marion Malazzo	16	eline	2/20/2015
877	5928619	Tunis Water Supply			
934	5928601	P. G. Haines	23.4	eline	2/20/2014
855	5928702	Sarah Engleman	89.1	tape	2/20/2015
943	5934100	Nathan Ausley	135.3	eline	3/24/2015
1023	5929537	Texas A & M University			
1061	5934807	Deeraville Water Supply Corporation 2	111.8	tape	4/7/2015
1062	5918101	Milano WSC - Well # 1			
1063	5918104	Milano WSC - Well # 2	272.2	tape	3/25/2015
1064	5918908	Milano WSC - Well # 3	303.6	tape	3/25/2015
1066	5918705	Milano WSC - Buer Well			
1082	5911705	Gause Water Supply # 1	168.0	tape	4/8/2015
1110	5924611	Southwest Milam Water Supply Corp.	145.4	tape	3/31/2015
1117	5917712	City of Rockdale (runway)	147.5	tape	3/31/2015
1118	5917711	City of Rockdale (airport)	154.3	eline	3/31/2015
1166	5929410	Holland Porter			
1197	5934107	Nathan C. Ausley	98.7	Tape	3/24/2015
1573	5934601	Deeraville Water Supply Corporation 1	70.7	tape	4/7/2015
1575	5927718	Deeraville Water Supply Corporation 4	171.9	tape	4/7/2015
1883	5932704	Martin Hobbs	94.2	tape	3/30/2015
2132	5925409	Glynn Phillips	180.4	tape	3/26/2015
2191	5917710	L.B. Kubliak			
2423	5902904	Gary & Deryl Emola			
6145	5927611	Alvin J. Kutach	111.7	tape	2/20/2015
6243	5925502	Birdie Kristoff	77.7	tape	4/7/2015
6305	5882008	Charles Lee McDaniel	24.7	eline	3/26/2015
6586	5927300	Francis Joseph Landry, Jr.	115.3	Sonic	2/10/2015
6621	5926402	Frederick A. Jackson	274.9	Tape	3/24/2015
6910	5926403	Charles & Jacquelin Stone Revocable Living Trust			
7864	5924612	Richard H. Griffith	55.1	tape	3/26/2015
7900	5924610	Southwest Milam Water Supply Corp.	143.7	tape	3/31/2015
7774	5910705	Jay Wise	153	Sonic	2/19/2015
7792	5925103	Nosck Family Partnership, Ltd.	120	eline	3/6/2015
7905		Heirs of Mary Anne Oliver			
8172		Norbert B. Zoschke	108.2	tape	3/30/2015
8239	5928804	Providence Baptist Church	28.1	eline	2/20/2015
8388	5943304	Wayne Edwards			
8415	5929433	Porter FLP			
8451	5925408	Antonio E. Cento	96.1	eline	3/6/2015
8658	5910705	Randal C. Leo	166.7	sonic	2/19/2015
8767	5934108	Terry Ausley	105.6	trans	3/23/2015
8935	5901904	Donald R. Scherman	47.9	Tape	2/18/2015
9064		Royalty Pecan Farms			
9095	5910707	Randal C. Leo	156.5	sonic	2/19/2015
9104	5928342	David L. Hodges	78.9	eline	2/20/2015
9157	5938009	Burleson County Pct. 4			
9166	5918108	Post Oak Savannah			
9187	5918109	Post Oak Savannah			
9215		Linda Garrison			
9230		David Pawlowski			
9327		Naomi White	86	Tape	2/18/2015

LIST OF 19 MONITORING WELLS WHOSE SOURCE AQUIFER IDENTITIES DIFFER BETWEEN DISTRICT AND TWDB DATA FILES

(TWDB well identification numbers are in parentheses)

<u>Well ID Numbers</u>	<u>Source Aquifer – District</u>	<u>Source Aquifer – TWDB</u>
25 (5917409)	Simsboro	Hooper
59 (5911402)	Carrizo	Calvert Bluff
77 (5919103)	Carrizo	Calvert Bluff
99 (5925508)	Carrizo	Calvert Bluff
223 (5902706)	Hooper	Wilcox
236 (5902307)	Simsboro	Wilcox
256 (5902901)	Simsboro	Wilcox
268 (5832101)	Simsboro	Hooper
433 (5920410)	Carrizo	Simsboro
457 (5919502)	Simsboro	Carrizo/Simsboro
638 (5937101)	Sparta	Queen City
1062 (5918101)	Simsboro	Calvert Bluff
1063 (5918104)	Simsboro	Calvert Bluff
1064 (5918908)	Simsboro	Carrizo/Simsboro
1066 (5918705)	Carrizo	Simsboro
1575 (5927718)	Carrizo	Carrizo/Calvert Bluff
6243 (5925502)	Calvert Bluff	Carrizo/Calvert Bluff
7774 (5910705)	Simsboro	Calvert Bluff
7793 (5925103)	Simsboro	Wilcox



A slide displaying the relative locations of the Carrizo, Calvert Bluff, Simsboro, and Hooper Aquifers presented to the District's directors.

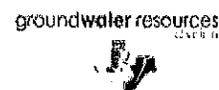
The TWDB records identifying source aquifers for each of the monitoring wells on the preceding list are below.

I only included the part of the records identifying the source aquifer – the complete recording data records were not copied.

The records are dated 1 July 2015.



**Texas Water Development Board
Groundwater Database Reports**



**Water Level Publication Report
County: Milam**

Water Level Measurements in Feet Above or Below (-) Land Surface

State Well Number	P/N	Date	Water Level	Change	Water Elevation	Meas. #	Agency	Method	Remark
5832101 (Aquifer: 124HOOP Well Depth: 60)									
P		1 / 11 / 1967	-19		464	01	07		7
P		9 / 13 / 1979	-7	12	476	01	01		1
P		4 / 14 / 1981	-9.66	-2.66	473.34	01	01		1
P		3 / 26 / 1982	-9.13	0.53	473.87	01	01		1
P		11 / 18 / 1982	-10.05	-0.92	472.95	01	01		1
P		11 / 11 / 1983	-10.9	-0.85	472.1	01	01		1

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5902307 (Aquifer: 124WLCX Well Depth: 450)									
P		11 / 30 / 1978	-116.13		301.87	01	01		1
P		3 / 20 / 1980	-115.36	0.77	302.64	01	01		1
P		4 / 15 / 1981	-117.27	-1.91	300.73	01	01		1
P		5 / 21 / 1981	-115.51	1.76	302.49	01	01		1
P		6 / 18 / 1981	-114.33	1.18	303.67	01	01		1
P		7 / 17 / 1981	-116.32	-1.99	301.68	01	01		1
P		8 / 18 / 1981	-117.3	-0.98	300.7	01	01		1
P		9 / 18 / 1981	-115.2	2.1	302.8	01	01		1
P		10 / 19 / 1981	-114.7	0.5	303.3	01	01		1
P		11 / 18 / 1981	-114.34	0.36	303.66	01	01		1
P		12 / 17 / 1981	-114.7	-0.36	303.3	01	01		1
P		1 / 21 / 1982	-114.45	0.25	303.55	01	01		1
P		2 / 17 / 1982	-114.13	0.32	303.87	01	01		1

5902706 (Aquifer: 124WLCX Well Depth: 315)

P	10/23/1976	-36		323	01	07	7	
N	3/20/1980				01	01		61
P	4/15/1981	-35.73		323.27	01	01	1	
P	3/26/1982	-38.13	-2.4	320.87	01	01	1	
P	11/17/1982	-37.9	0.23	321.1	01	01	1	
P	11/10/1983	-120.45	-82.6	238.55	01	01	1	02
P	11/12/1984	-41.15	79.3	317.85	01	01	1	
P	11/5/1985	-38.2	2.95	320.8	01	01	1	
P	12/8/1986	-36.18	2.02	322.82	01	01	1	
N	11/17/1987				01	01		61
P	1/18/1989	-41.92		317.08	01	01	1	
P	11/13/1989	-51.18	-9.26	307.82	01	01	1	04
P	11/13/1990	-61.34	-10.2	297.66	01	01	1	04
P	11/5/1991	-42.9	18.44	316.1	01	01	1	

5902901 (Aquifer: 124WLCX Well Depth: 318)

P	11/21/1967	-115		228	01	07	7	
P	9/12/1979	-90.95	24.05	252.05	01	01	1	
P	3/20/1980	-90.46	0.49	252.54	01	01	1	

5910705 (Aquifer: 124CABF Well Depth: 560)

P	8/17/2009	-128.53		311.47	01	04	1	
P	1/22/2010	-143.4	-14.9	296.6	01	06	0	
P	1/25/2011	-144.2	-0.8	295.8	01	06	0	
P	5/18/2011	-144.62	-0.42	295.38	01	04	1	04
P	2/15/2012	-148.8	-4.18	291.2	01	06	7	

5911402 (Aquifer: 124CABF Well Depth: 323)

P	4/ 5 /1978	-158		268	01	07	7
P	9/ 12/1979	-130.5	27.5	295.5	01	01	1
P	3/ 20/1980	-130.14	0.36	295.86	01	01	1
P	4/ 20/1981	-130.95	-0.81	295.95	01	01	1
P	11/ 17/1982	-132.91	-1.96	293.09	01	01	1
P	11/ 10/1983	-132.62	0.29	293.38	01	01	1
P	11/ 13/1984	-134.05	-1.43	291.95	01	01	1
P	11/ 5 /1985	-134.6	-0.55	291.4	01	01	1

5917409 (Aquifer: 124HOOP Well Depth: 391)

P	5/ 0 /1980	-120		384	01	07	7
P	2/ 0 /2007	-133.09	-13.1	370.91	01	06	2
P	3/ 1 /2008	-133.37	-0.28	370.63	01	06	2
P	2/ 28/2009	-134.02	-0.65	369.98	01	06	7
P	3/ 14/2012	-166.2	-32.2	337.8	01	06	7
P	1/ 17/2013	-167.2	-1	336.8	01	06	9
P	3/ 25/2014	-167.2		336.8	01	06	4

Min -167.2 Max -120 Avg -145.869

5918101 (Aquifer: 124CABF Well Depth: 790)

P	6/ 29/1965	-242		318	01	12	7
P	3/ 1 /2008	-326	-84	234	01	06	2
P	2/ 28/2009	-300.61	25.39	259.39	01	06	7
P	2/ 21/2012	-292.5	8.11	267.5	01	06	7
P	2/ 20/2013	-282.6	9.9	277.4	01	06	0
P	2/ 24/2014	-285	-2.4	275	01	06	0

Min -326 Max -242 Avg -285.118

5918104 (Aquifer: 124CABF Well Depth: 800)

P	1/31/1974	-206.6		343.4	01	12	7
P	11/9/1990	-180.49	28.11	369.51	01	01	1
N	6/11/2002				01	01	42
P	5/2/2006	-294		256	01	08	3 02
P	3/1/2008	-279.09	14.91	270.91	01	06	2
P	2/28/2009	-283.71	-4.62	266.29	01	06	7
P	2/2/2010	-318	-34.3	232	01	06	3
P	3/16/2011	-270	48	280	01	06	1
P	2/21/2012	-267.2	2.8	282.8	01	06	7
P	2/20/2013	-269.6	-2.3	280.5	01	06	0
P	2/24/2014	-271.4	-1.9	278.6	01	06	1

Min -318 Max -180.49 Avg -263.999

5918705 (Aquifer: 124SMBR Well Depth: 800)

P	3/1/2008	-221.6		328.4	01	06	2
P	2/28/2009	-221	0.6	329	01	06	7
P	2/2/2010	-220.3	0.7	329.7	01	06	0
P	2/22/2012	-218.8	1.5	331.2	01	06	7
P	2/20/2013	-219.3	-0.5	330.7	01	06	0
P	2/24/2014	-219.8	-0.5	330.2	01	06	0

Min -221.6 Max -218.8 Avg -220.133

5918908 (Aquifer: 124CZSB Well Depth: 1687)

P	7/9/1987	-320		190	01	06	7
P	8/30/2000	-404	-84	106	01	01	3
P	2/0/2007	-362.16	41.84	147.84	01	06	2
P	3/1/2008	-343.78	18.38	166.22	01	06	2
P	2/28/2009	-359.85	-16.1	150.15	01	06	7
P	2/2/2010	-286.4	73.45	223.6	01	06	0
P	2/4/2012	-297.6	-11.2	212.4	01	06	7
P	2/20/2013	-297.8	-0.2	212.2	01	06	0
P	2/24/2014	-300.4	-2.6	209.6	01	06	0

Min -404 Max -286.4 Avg -330.221

5919103 (Aquifer: 124CABF Well Depth: 522)

P	9/11/1979	-116.8		314.2	01	01	1
P	3/20/1980	-119	-2.2	312	01	01	1
P	4/14/1981	-119.2	-0.2	311.8	01	01	1
P	11/18/1982	-119.72	-0.52	311.28	01	01	1
P	11/10/1983	-119.6	0.22	311.5	01	01	1
P	11/13/1984	-121.32	-1.82	309.68	01	01	1
P	11/5/1985	-120.8	0.52	310.2	01	01	1
P	12/16/1986	-121.1	-0.3	309.9	01	01	1
P	11/17/1987	-122.12	-1.02	308.88	01	01	1
P	1/18/1989	-123.6	-1.48	307.4	01	01	1
-

5919502 (Aquifer: 124CZSB Well Depth: 2018)

P	5/28/1990	-220		243	01	06	7
P	8/30/2000	-291	-71	172	01	01	3
P	2/0/2007	-310.64	-19.6	152.36	01	06	2
P	3/1/2008	-312.95	-2.31	150.05	01	06	2
P	2/2/2010	-263.5	49.45	199.5	01	06	7
P	2/22/2012	-280.9	-17.4	182.1	01	06	7
P	2/20/2013	-280	0.9	183	01	06	0
P	2/24/2014	-281.5	-1.5	181.5	01	06	0

Min -312.95 Max -220 Avg -280.061

5920410 (Aquifer: 124SMBR Well Depth: 800)

P	3/1/2008	-19.6		330.4	01	06	2
P	2/28/2009	-22.4	-2.8	327.6	01	06	7
P	2/2/2010	-22.4		327.6	01	06	0
P	2/22/2012	-25.8	-3.4	324.2	01	06	7
P	2/20/2013	-25.4	0.4	324.6	01	06	2
P	2/24/2014	-25.6	-0.2	324.4	01	06	2

Min -25.8 Max -19.6 Avg -23.5333

5925103 (Aquifer: 124WLCX Well Depth: 420)							
P	1 / 25 / 2010	-126		285	01	06	7
P	1 / 28 / 2011	-124.5	1.5	286.5	01	06	7
P	2 / 17 / 2012	-129.5	-5	281.5	01	06	7
P	3 / 1 / 2013	-121.5	8	289.5	01	06	0
P	2 / 20 / 2014	-123.2	-1.7	287.8	01	06	0
<hr/>							
Min	-129.5	Max	-121.5	Avg	-124.94		

5925502 (Aquifer: 124CZCB Well Depth: 614)							
P	5 / 8 / 1968	-53		372	01	01	1
P	9 / 12 / 1977	-52.73	0.27	372.27	01	01	1
P	3 / 17 / 1978	-53.78	-1.05	371.22	01	01	1
P	3 / 12 / 1979	-55.36	-1.58	369.64	01	01	1 04
P	3 / 19 / 1980	-53.46	1.9	371.54	01	01	1
P	4 / 28 / 1981	-54.44	-0.95	370.59	01	01	1
P	3 / 22 / 1982	-54.64	-0.23	370.36	01	01	1
P	11 / 16 / 1982	-55.07	-0.43	369.93	01	01	1
P	11 / 16 / 1983	-55.45	-0.38	369.55	01	01	1

5925508 (Aquifer: 124CABF Well Depth: 520)							
P	9 / 23 / 1973	-90		321	01	07	7
P	3 / 21 / 1980	-34.37	55.63	376.63	01	01	1
P	4 / 14 / 1981	-35.35	-0.98	375.65	01	01	1
P	3 / 26 / 1982	-35.28	0.07	375.72	01	01	1
P	11 / 18 / 1982	-35.57	-0.29	375.43	01	01	1
P	11 / 11 / 1983	-35.5	0.07	375.5	01	01	1
P	11 / 12 / 1984	-36.12	-0.62	374.88	01	01	1
P	11 / 5 / 1985	-36.62	-0.5	374.38	01	01	1
P	12 / 16 / 1986	-36.53	0.09	374.47	01	01	1
P	11 / 17 / 1987	-36.71	-0.18	374.29	01	01	1
P	1 / 19 / 1989	-40.33	-3.62	370.67	01	01	1

5927718 (*Aquifer: 124CZCB* *Well Depth: 1300*)

P	12/31/1990	-166		284	01	07	7
P	8/28/2000	-201.02	-35.0	248.98	01	01	2
P	9/13/2000	-199.95	1.07	250.05	01	01	1
P	3/11/2010	-162.7	37.25	287.3	01	06	0
P	3/23/2011	-168.2	-5.5	281.8	01	06	9
P	3/6/2013	-170.2	-2	279.8	01	06	0
N	5/15/2014				01	06	61
Min		-201.02	Max	-162.7	Avg	-178.012	

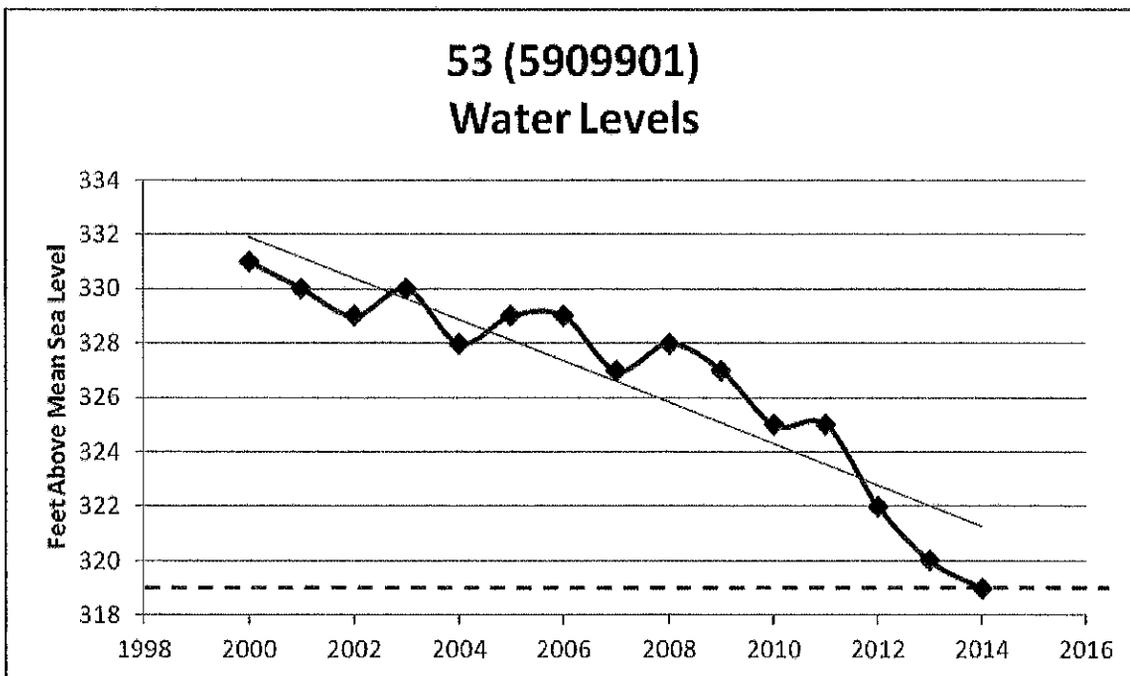
5937101 (*Aquifer: 124QNCT* *Well Depth: 1620*)

P	3/2/2011	-23.9		215.1	01	06	1
P	2/16/2012	-24.3	-0.4	214.7	01	06	7
P	3/7/2013	-26.6	-2.3	212.4	01	06	9
P	2/18/2014	-28.3	-1.7	210.7	01	06	4
Min		-28.3	Max	-23.9	Avg	-25.775	

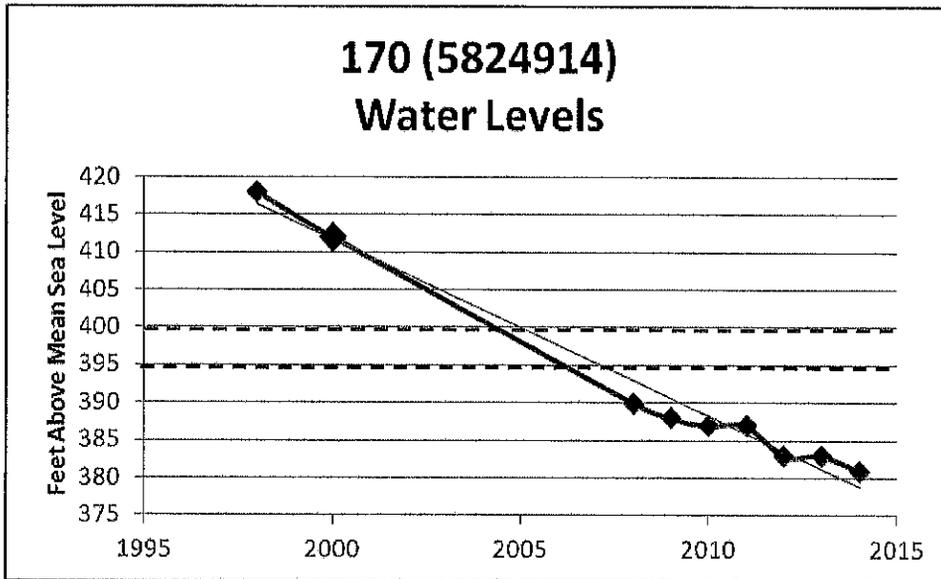
GRAPHS OF THE WATER LEVELS OF MONITORING WELLS IN THE SIMSBORO SHALLOW MANAGEMENT ZONE + SUPPORTING TWDB RAW DATA

General notes:

1. The threshold value is a 20-foot drawdown from 2000 to 2059
2. Threshold Level 1 is reached when the drawdown reaches 60% of the threshold value – indicated as discontinuous blue line in the graphs.
3. Threshold Level 2 is reached when the drawdown reaches 80% of the threshold value – indicated as discontinuous red line in the graphs.
4. Water level measurement points are identified with blue diamonds.
5. The red diamond signifies a 2000 baseline measurement derived by extrapolation from the two nearest measurements.
6. The continuous red line is a linear trend line.
7. Monitoring wells are identified by District and TWDB (in parentheses) identification numbers.
8. Snips of the TWDB data used to develop the graphs are presented following the graphs.
9. A comment about my ability to perform graphical analyses: My entire professional career was as a medical research scientist – my Ph.D. was awarded by The Johns Hopkins University and I served as a tenured faculty member at The University of Texas Southwestern Medical School at Dallas for fifteen years. My research required advanced statistical analyses of large amounts of experimental data. The graphical analyses reported below are straight-forward and require no statistics to support the conclusions.
10. A registered hydrogeologist also confirmed my interpretation of the below graphical analyses.

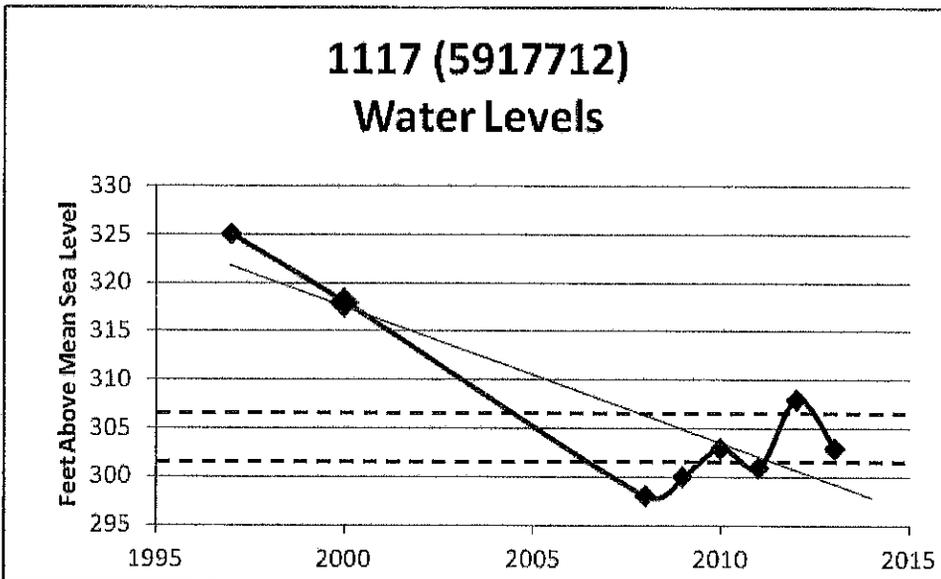


Threshold Level 1 = -----



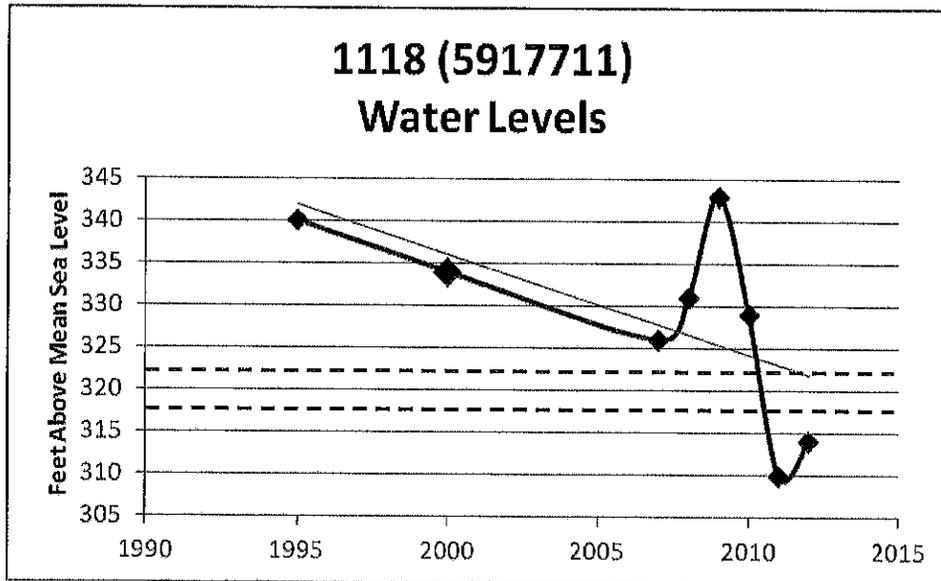
Threshold Level 1 = -----

Threshold Level 2 = -----



Threshold Level 1 = -----

Threshold Level 2 = -----



Threshold Level 1 = -----

Threshold Level 2 = -----

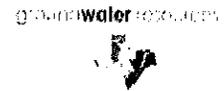
THE TWDB RAW DATA USED TO DEVELOP THE GRAPHS ARE BELOW

The records are dated 1 July 2015

NOTE: The source aquifer is identified for each well (SMBR = Simsboro)



**Texas Water Development Board
Groundwater Database Reports**



**Water Level Publication Report
County: Milam**

Water Level Measurements in Feet Above or Below (-) Land Surface

State Well Number	P/N	Date	Water Level	Change	Water Elevation	Mens. #	Agency	Method	Remark
5000001			<i>(Aquifer: 124SMBR Well Depth: 169)</i>						
P		11 / 29 / 1960	-88.52		343.48	01	04	1	
P		8 / 11 / 1979	-91.3	-2.78	340.7	01	01	1	
P		3 / 21 / 1980	-90.02	1.28	341.98	01	01	1	
P		4 / 20 / 1981	-95.3	-5.28	336.7	01	01	1	
P		3 / 25 / 1982	-90.8	4.5	341.2	01	01	1	
P		11 / 17 / 1982	-91.99	-1.19	340.01	01	01	1	
P		11 / 10 / 1983	-91.76	0.23	340.24	01	01	1	
P		11 / 12 / 1984	-93	-1.24	339	01	01	1	
P		11 / 5 / 1985	-97.55	-4.55	334.45	01	01	1	
P		12 / 8 / 1986	-94.09	3.46	337.91	01	01	1	
P		11 / 17 / 1987	-95.08	-0.99	336.92	01	01	1	
P		1 / 18 / 1989	-95.45	-0.37	336.55	01	01	1	
P		11 / 9 / 1989	-96.6	-1.15	335.4	01	01	1	
P		11 / 13 / 1990	-102.3	-5.7	329.7	01	01	1	
P		11 / 5 / 1991	-98.3	4	333.7	01	01	1	
P		11 / 16 / 1992	-97.25	1.05	334.75	01	01	1	
P		1 / 27 / 1994	-99.2	-1.95	332.8	01	01	1	
P		12 / 7 / 1994	-101.39	-2.19	330.61	01	01	1	
P		1 / 19 / 1996	-98	3.39	334	01	01	1	
P		11 / 8 / 1996	-98.37	-0.37	333.63	01	01	1	
P		1 / 15 / 1998	-99.4	-1.03	332.6	01	01	1	
P		1 / 7 / 1999	-102.7	-3.3	329.3	01	01	1	
P		1 / 12 / 2000	-100.2	2.5	331.8	01	01	1	20
P		9 / 14 / 2000	-101.37	-1.17	330.63	01	01	1	
P		1 / 23 / 2001	-101.7	-0.33	330.3	01	01	1	

P	1/15/2002	-102.72	-1.02	329.28	01	01	1
P	1/27/2003	-102.05	0.67	329.95	01	01	1
P	2/20/2004	-103.89	-1.84	328.11	01	01	1
P	1/12/2005	-102.7	1.19	329.3	01	01	1
P	1/19/2006	-103.23	-0.53	328.77	01	01	1
P	2/0/2007	-104.6	-1.37	327.4	01	06	2
P	3/1/2008	-104.2	0.4	327.8	01	06	2
P	2/28/2009	-105.2	-1	326.8	01	06	7
P	1/27/2010	-106.9	-1.7	325.1	01	06	7
P	1/25/2011	-107.5	-0.6	324.5	01	06	7
P	2/17/2012	-109.9	-2.4	322.1	01	06	7
P	1/16/2013	-112.1	-2.2	319.9	01	06	9
P	3/13/2014	-113	-0.9	319	01	06	2

5017714 (Aquifer: 124SMBR Well Depth: 380)

P	8/20/2001	-121		351	01	07	7
P	2/0/2007	-128.5	-7.5	343.5	01	06	2
P	3/1/2008	-127.5	1	344.5	01	06	2
P	2/28/2009	-129.7	-2.2	342.3	01	06	7
P	2/9/2010	-130.1	-0.4	341.9	01	06	7
P	2/7/2011	-130.5	-0.4	341.5	01	06	7
P	3/4/2013	-138.3	-7.8	333.7	01	06	1
N	2/20/2014				01	06	61

5017713 (Aquifer: 124SMBR Well Depth: 408)

P	8/19/1998	-115		370	01	07	7
P	2/0/2007	-139.79	-24.8	345.21	01	06	2
P	3/1/2008	-136.73	3.06	348.27	01	06	2
P	2/28/2009	-140.03	-3.3	344.97	01	06	7
P	2/9/2010	-139.53	0.5	345.47	01	06	7
P	2/7/2011	-140.73	-1.2	344.27	01	06	7

P	3/4/2013	-147.23	-6.5	337.77	01	06	2
P	3/25/2014	-145.63	1.6	339.37	01	06	2

5824977 (Aquifer: 124SMBR Well Depth: 295)

P	5/14/1998	-90.3		417.7	01	07	7
P	3/1/2008	-118.4	-28.1	389.6	01	06	2
P	2/28/2009	-119.7	-1.3	388.3	01	06	7
P	2/3/2010	-120.8	-1.1	387.2	01	06	7
P	2/7/2011	-121.4	-0.6	386.6	01	06	7
P	3/13/2012	-124.6	-3.2	383.4	01	06	7
P	2/15/2013	-124.6		383.4	01	06	0
P	2/27/2014	-127.2	-2.6	380.8	01	06	0

5917712 (Aquifer: 124SMBR Well Depth: 475)

P	4/24/1997	-127		325	01	07	7
P	3/1/2008	-153.8	-26.8	298.2	01	06	2
P	2/28/2009	-151.85	1.95	300.15	01	06	7
P	1/26/2010	-148.85	3	303.15	01	06	7
P	2/7/2011	-150.65	-1.8	301.35	01	06	7
P	3/23/2012	-144.45	6.2	307.55	01	06	7
P	3/1/2013	-149.35	-4.9	302.65	01	06	0
N	2/28/2014				01	06	61

5917711 (Aquifer: 124SMBR Well Depth: 463)

P	4/20/1995	-125		340	01	07	7
N	6/11/2002				01	01	42
N	5/2/2006				01	01	41
P	2/0/2007	-139.3		325.7	01	06	2
P	3/1/2008	-134	5.3	331	01	06	2
P	2/28/2009	-122.3	11.7	342.7	01	06	7
P	1/25/2010	-135.7	-13.4	329.3	01	06	0
P	2/7/2011	-155.3	-19.6	309.7	01	06	7
P	3/21/2012	-151	4.3	314	01	06	7
N	2/28/2014				01	06	61

NOTES FOR OTHER SHALLOW MANAGEMENT ZONES

CARRIZO SHALLOW MANAGEMENT ZONE (20-foot threshold value)

- 59 (5911402) - Listed as Calvert Bluff well by TWDB
- 77 (5919103)- Listed as Calvert Bluff well by TWDB
- 99 (5925508)- Listed as Calvert Bluff well by TWDB
- 433 (5920410) – Listed as Simsboro well by TWDB
- 1066 (5918705) – Listed as Simsboro well by TWDB
- 1575 (5927718) – Listed as Carrizo/Calvert Bluff well by TWDB
- 9167 (5918109) – Too few recordings for analysis - dropped 21 feet since 2012
- Not enough data to decide if threshold value exceeded

CALVERT BLUFF SHALLOW MANAGEMENT ZONE (20-foot threshold value)

- Only two wells with sufficient recording points for analysis
- 6243 (5925502) - One of the two wells with sufficient recording points was identified as a Carrizo/Calvert Bluff well by TWDB – dropped 10 feet (2000-2014)
- 73 (5910907) – 28-foot drop (2000-2014)
- Not enough data to decide if threshold value exceeded

HOOPER SHALLOW MANAGEMENT ZONE (20-foot threshold value)

- 26 (5917103) – 8-foot drop (2000-2014)
- 221 (590605) - 20-foot drop (2008–2014)
- 223 (5902706) – Listed as Wilcox well by TWDB
- 1110 (5824611) – 30-foot drop (2003-2014)
- 7506 (5824610) – 17-foot drop (2000-2014)
- 8935 (5901904) – 17-foot drop (2002-2014)
- Average = 18-foot drop = Exceeds Threshold Level 2

QUEEN CITY SHALLOW MANAGEMENT ZONE (10-foot threshold value)

- 84 (5919302) – 7-foot drop (2000-2014)
- 308 (5927716) – 6-foot drop (2000-2014)
- 518 (5927204) - 5-foot drop (2000-2014)
- 434 (5920409) – this well’s level has been statistically the same since 1969 perhaps due to close proximity to Brazos River – dropped from analysis – 1-foot increase (2000-2014)
- 1197 (5934107) – Not enough records for analysis (only since 2010 – no change)
- 1573 (5934601) – Not enough records for analysis (one record at 1977 at 328 feet and then starts again at 2010 at 315 feet)
- Used the first three wells on the list to decide Threshold Level 1 has been exceeded

SPARTA SHALLOW MANAGEMENT ZONE

- No monitoring wells in this zone

Table 7-3 Threshold values for Average Drawdown for the Shallow Management Zones

Aquifer	Average Drawdown (ft) that Occurs between January 2000 and December 2059 in the Shallow Management Zone
Sparta	10
Queen City	10
Carrizo	20
Upper Wilcox (Calvert Bluff Fm)	20
Middle Wilcox (Simsboro Fm)	20
Lower Wilcox (Hooper Fm)	20
Yegua-Jackson	15

Threshold Level 1 = 60% of threshold value

Threshold Level 2 = 80% of threshold value