

## RESOLUTION FOR THE ADOPTION OF THE DESIRED FUTURE CONDITIONS FOR ALL AQUIFERS IN GROUNDWATER MANAGEMENT AREA 14

Whereas, pursuant to Section 35.004 of the Texas Water Code, the Texas Water Development Board ("TWDB") has designated groundwater management areas that, together, cover all major and minor aquifers in the state; and

Whereas, each groundwater management area was designated with the objective of providing the most suitable area for the management of groundwater resources; and

Whereas, through title 31, Section 356.23 of the Texas Administrative Code, the TWDB has designated the area encompassing all of Austin, Brazoria, Brazos, Chambers, Fort Bend, Galveston, Grimes, Hardin, Harris, Jasper, Jefferson, Liberty, Montgomery, Newton, Orange, Polk, San Jacinto, Tyler, Walker, Waller, and Washington counties as Groundwater Management Area No. 14 ("GMA 14"); and

Whereas, GMA 14 includes all or portions of areas subject to groundwater regulation by Bluebonnet Groundwater Conservation District (Grimes, Walker, Austin, and Waller Counties), Brazoria County Groundwater Conservation District, Brazos Valley Groundwater Conservation District (Brazos County), Lone Star Groundwater Conservation District (Montgomery County), Lower Trinity Groundwater Conservation District (Polk and San Jacinto Counties), and Southeast Texas Groundwater Conservation District (Hardin, Jasper, Newton, and Tyler Counties) (the "Member Districts"); and

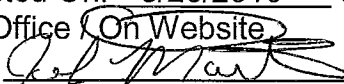
Whereas Fort Bend Subsidence District (Fort Bend County), Harris-Galveston Subsidence District (Galveston, Harris Counties), and other stakeholders within GMA 14 from Chambers County, Liberty County, and Washington County also contributed to the development of DFCs for GMA 14; and

Whereas, Section 36.108 of the Texas Water Code requires the Member Districts in GMA 14 to consider groundwater availability models and other data or information for the management area and establish a desired future condition ("DFC") for each relevant aquifer within GMA 14 by September 1, 2010; and

Whereas, the Member Districts within GMA 14 secured hydrogeologic and engineering consulting services to provide technical support in their efforts to establish requisite DFCs; and

Whereas, in developing the DFCs for the relevant aquifers within GMA 14, the Member Districts in GMA 14 considered their respective desired production volumes for the 2010-2060 planning horizon, the aquifer availability projections in the 2006 Region H Regional Water Plan, and the results of the Northern Gulf Coast Groundwater Availability Model (GAM) simulation that was performed using all relevant input parameters; and

Whereas, the Member Districts used this information to developed proposed DFCs for the portions of the northern segment of the Gulf Coast aquifer that occurs within the bounds of GMA 14; and

Posted On: 3/25/2010	at: 2:50 pm
At Office	<input checked="" type="checkbox"/> On Website
By: 	
Title: _____	General Manager

Whereas, the Members Districts submitted the GAM run for the Northern Gulf Coast Aquifer, along with a technical memo describing the GAM run, to TWDB; and

Whereas, TWDB conducted a review of the GMA 14 GAM run for the Northern Gulf Coast Aquifer in GAM Task 10-002; and

Whereas, TWDB developed an updated GAM Run 10-023 for the Northern Gulf Coast Aquifer and submitted it to GMA 14, including Scenario 3 which includes the original pumpage for counties with the exception of counties within Southeast Texas Groundwater Conservation District in which pumpage was adjusted to meet the previously developed drawdown conditions; and

Whereas, the Brazos G Regional Water Planning Group has produced an estimate of groundwater availability from the Yegua-Jackson Aquifer in Washington County based on aquifer recharge; and

Whereas, TWDB has prepared a report for GAM Task 10-012 for the Yegua-Jackson Aquifer based on groundwater production information published in the 2007 State Water Plan; and

Whereas, Bluebonnet Groundwater Conservation District has prepared and adopted a management plan recommending management conditions for the Carrizo-Wilcox, Brazos River Alluvium, Queen City, Sparta, and Yegua-Jackson aquifers; and

Whereas, during joint meetings noticed and conducted pursuant to Section 36.108(e) of the Texas Water Code, the Member Districts considered GAMs and other data and information relevant to the development of DFCs for GMA 14, including input and comments from stakeholders within GMA 14; and

Whereas, the Member Districts find that all notice requirements for a meeting, held this day, to take up and consider adoption of the DFCs proposed herein for GMA 14 have been, and are, satisfied; and

Whereas, the Member Districts find that the DFCs proposed herein for establishment are each merited and necessary for the effective and prudent management of groundwater resources within GMA 14, and have otherwise been developed in accordance with, and do satisfy the obligations imposed by, Chapter 36 of the Texas Water Code and all other applicable laws of the State of Texas.

Now, therefore, be it resolved by the Member Districts of GMA 14 that the following DFCs are each hereby established:

### Formations in Fort Bend, Galveston, and Harris Counties

The Groundwater Management Area (GMA) efforts to determine Desired Future Conditions (DFCs) is primarily an aquifer water-level based approach to describe the regional and local desires for the aquifer beneath them. The GMA process only requires Groundwater Conservation Districts (GCDs) to determine the DFCs for the entire GMA, regardless of whether each county is included within a GCD. The Fort Bend Subsidence District (FBSD) and the Harris-Galveston Subsidence District (HGSD), operating in Fort Bend County and Harris and Galveston Counties, respectively, regulate groundwater for the purpose of ending land surface subsidence within their jurisdiction. They are not GCDs and operate considerably different from the typical GCD. Therefore, in an official context these three counties are “unrepresented” but the GCDs within GMA-14 must still determine the DFC for these counties.

Both FBSD and HGSD have participated in an unofficial role to aid the GCDs within GMA-14 with their evaluation of Fort Bend, Galveston and Harris County information. The groundwater pumpage within these three counties even though regulated is still greater than the sum of all other counties within GMA-14. FBSD and HGSD recognize that the projected groundwater pumpage from these three counties will impact the decisions of GMA-14 throughout a large portion of the area. FBSD and HGSD have provided considerable historical and projected groundwater pumpage data and details of regulations to assist GMA-14 in incorporating these counties in the overall GMA-14 DFC. FBSD and HGSD cannot however, present DFCs for these three counties in terms of aquifer water-level changes over time. The FBSD and HGSD regulations do not specifically address water-levels nor do they designate a specific pumping limit, rather the regulations are based on limitations of groundwater as a percentage of total water demand. The percentage of groundwater to total water demand is decreased over time, as total water demand increases.

The goal of both FBSD and HGSD is to end land surface subsidence that is caused by man’s pumpage of groundwater. There is a clearly established link between the over-pumpage of groundwater and land surface subsidence. The DFC within the aquifer beneath Fort Bend, Galveston, and Harris Counties has no easily defined relationship to water-levels. The Desired Future Condition for FBSD and HGSD is the reduction and halting of the compaction of clay layers within the aquifer caused by the over-pumpage of groundwater. Stated more simply, the DFC for these three counties is that future land surface subsidence be avoided. That stated HGSD and FBSD have adopted regulations, most recently in 1999 and 2003 respectively that require the reduction of groundwater pumpage and the conversion to alternate water sources, while balancing with the realistic ability of the permittees to achieve compliance with these regulations.

Within HGSD, from central to southeastern Harris County and all of Galveston County (Regulatory Areas 1 and 2), virtually all permittees have achieved compliance with previous and current HGSD regulations. Subsidence has been halted and water-levels within the aquifer have risen dramatically in these areas. However, in northern and western areas of Harris County (Regulatory Area 3), the HGSD regulations have allowed groundwater pumpage to continue until the required reductions in 2010, 2020, and 2030. With these scheduled reductions in groundwater pumpage, subsidence will slow dramatically and even be halted with water-levels stabilizing and in later years rising.

Within FBSD, from central to northern and eastern Fort Bend County (Regulatory Area A), the regulations call for reductions of groundwater pumpage in 2013/2015, and 2025. Similar to HGSD's Regulatory Area 3, subsidence within FBSD Regulatory Area A will slow dramatically and even be halted with water-levels stabilizing and in later years rising.

In both HGSD and FBSD, because of the percentage based approach to regulations, groundwater pumpage will increase until scheduled reductions in milestone years (ex: 2010, 2013/2015, 2020, 2025, and 2030). In between milestone years, groundwater pumpage will increase with the assumed increase in total water demand from an assumed increase in population. In order to demonstrate the DFC of these three counties using water-level changes, the area of previous groundwater-to-alternative water conversions must be separated from future conversions AND each annual time step must be depicted. If a further separation in to layers of the aquifer is necessary, then it is quite apparent that describing the DFC in terms of water-levels is far too complicated and error prone.

The HGSD and FBSD have submitted to GMA-14 their current regulations and projected groundwater pumpages through the year 2030. This data has been divided into the grid cells/layers relative to the Northern Gulf Coast Groundwater Availability Model (NGCGAM) and utilized by the GCDs in the development of their DFCs. For the years beyond 2030, assumptions were made to address groundwater pumping limits.

Groundwater pumpage within GMA-14 from Fort Bend, Galveston, and Harris Counties is regulated by FBSD and HGSD, non GCD governmental agencies (the only GMA with this occurrence) and the missions of HGSD and FBSD are vastly different from GCDs and do not fit well with a water-level designed DFC process). The groundwater pumpage projections developed in recognition of the HGSD and FBSD regulatory plans have been utilized without adjustment by GMA14 in the DFC process. Therefore, the DFCs adopted by GMA-14 are consistent with the HGSD and FBSD regulatory plans.

**Formations of the Gulf Coast Aquifer*****Austin County (BGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 17 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 10 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 11 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 20 feet after 52 years.

***Brazoria County (BCGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 45 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 40 feet after 52 years.

***Brazos County (BVGCD)***

- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 7 feet after 52 years.

***Chambers County***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 43 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 36 feet after 52 years.

***Grimes County (BGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 0 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 5 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 10 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 28 feet after 52 years.

***Hardin County (STGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 17 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 27 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 23 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 37 feet after 52 years.

***Jasper County (STGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 10 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 23 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 24 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 21 feet after 52 years.

***Jefferson County***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 25 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 26 feet after 52 years.

***Liberty County***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 32 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 37 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 28 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 64 feet after 52 years.

***Montgomery County (LSGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 3 feet after 8 years.

- From estimated year 2016 conditions, the average draw down of the Chicot aquifer should not exceed approximately 6 feet after 44 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 13 feet after 8 years.
- From estimated year 2016 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 25 feet after 44 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 10 feet after 8 years.
- From estimated year 2016 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 23 feet after 44 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 61 feet after 8 years.
- From estimated year 2016 conditions, the average draw down of the Jasper aquifer should not exceed approximately –38 feet after 44 years.

#### ***Newton County (STGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 9 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 20 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 22 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 18 feet after 52 years.

#### ***Orange County***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 14 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 19 feet after 52 years.

#### ***Polk County (LTGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 4 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 4 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 20 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 41 feet after 52 years.

***San Jacinto County (LTGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 5 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 7 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 18 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 72 feet after 52 years.

***Tyler County (STGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 3 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 16 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 19 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 33 feet after 52 years.

***Walker County (BGCD)***

- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 10 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 5 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 33 feet after 52 years.

***Waller County (BGCD)***

- From estimated year 2008 conditions, the average draw down of the Chicot aquifer should not exceed approximately 7 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 8 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 9 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 25 feet after 52 years.

***Washington County***

- From estimated year 2008 conditions, the average draw down of the Evangeline aquifer should not exceed approximately 1 foot after 52 years.
- From estimated year 2008 conditions, the average draw down of the Burkeville confining unit should not exceed approximately 17 feet after 52 years.
- From estimated year 2008 conditions, the average draw down of the Jasper aquifer should not exceed approximately 20 feet after 52 years.

**Carrizo Sand Aquifer**

***Grimes County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Carrizo Sand Aquifer should not exceed approximately 52.8 feet average draw down across the area of occurrence of the aquifer.

***Walker County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Carrizo Sand Aquifer should not exceed approximately 45.7 feet average draw down across the area of occurrence of the aquifer.

**Queen City Aquifer**

***Grimes County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Queen City Aquifer should not exceed approximately 16.8 feet average draw down across the area of occurrence of the aquifer.

***Walker County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Queen City Aquifer should not exceed approximately 21.0 feet average draw down across the area of occurrence of the aquifer.

### **Sparta Aquifer**

#### ***Grimes County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Sparta Aquifer should not exceed approximately 14 feet average draw down across the area of occurrence of the aquifer.

#### ***Walker County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the Sparta Aquifer should not exceed approximately 19.5 feet average draw down across the area of occurrence of the aquifer.

### **Yegua-Jackson Aquifer**

#### ***Grimes County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the unconfined portion of the Yegua should not exceed approximately 10 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the confined portion of the Yegua should not exceed approximately 15 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the brackish confined portion of the Yegua should not exceed approximately 20 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the unconfined portion of the Jackson should not exceed approximately 10 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the confined portion of the Jackson should not exceed approximately 15 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the brackish confined portion of the Jackson should not exceed approximately 20 feet average draw down across the area of occurrence of the aquifer.

***Jasper County (STGCD)***

- The portion of the Yegua-Jackson occurring in Jasper County is declared non-relevant.

***Newton County (STGCD)***

- The portion of the Yegua-Jackson occurring in Newton County is declared non-relevant.

***Polk County (LTGCD)***

- From estimated 2010 conditions, the average drawdown of the Yegua-Jackson should not exceed approximately 2 feet average draw down across the area of occurrence of the aquifer.

***Tyler County (STGCD)***

- The portion of the Yegua-Jackson occurring in Tyler County is declared non-relevant.

***Walker County (BGCD)***

- From estimated 2010 conditions, the average drawdown of the unconfined portion of the Yegua should not exceed approximately 10 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the confined portion of the Yegua should not exceed approximately 15 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the brackish confined portion of the Yegua should not exceed approximately 20 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the unconfined portion of the Jackson should not exceed approximately 10 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the confined portion of the Jackson should not exceed approximately 15 feet average draw down across the area of occurrence of the aquifer.
- From estimated 2010 conditions, the average drawdown of the brackish confined portion of the Jackson should not exceed approximately 20 feet average draw down across the area of occurrence of the aquifer.

***Washington County***

- From estimated 2010 conditions, no additional drawdown of the Yegua Jackson across the area of occurrence of the aquifer.

**River Alluvium Aquifers**

***Austin County (BGCD)***

- From estimated 2010 conditions, the saturated thickness of the Brazos River Alluvium should be maintained at 90 percent.
- From estimated 2010 conditions, the saturated thickness of the San Bernard River Alluvium should be maintained at 90 percent.

***Brazos County (BVGCD)***

- The Brazos River Alluvium Aquifer is viewed as not relevant to the joint planning process of GMA 14.

***Grimes County (BGCD)***

- From estimated 2010 conditions, the saturated thickness of the Brazos River Alluvium should be maintained at 90 percent.
- From estimated 2010 conditions, the saturated thickness of the Navasota River Alluvium should be maintained at 90 percent.

***Walker County (BGCD)***

- From estimated 2010 conditions, the saturated thickness of the San Jacinto River Alluvium should be maintained at 90 percent.
- From estimated 2010 conditions, the saturated thickness of the Trinity River Alluvium should be maintained at 90 percent.

***Waller County (BGCD)***

- From estimated 2010 conditions, the saturated thickness of the Brazos River Alluvium should be maintained at 90 percent.

***Washington County***

- From estimated 2010 conditions, the saturated thickness of the Brazos River Alluvium should be maintained at 90 percent.

And it is so ordered and passed this 25th day of August, 2010.

Signed Lloyd A Behm  
Mr. Lloyd Behm                      Bluebonnet Groundwater Conservation District

Signed Kent Burkett  
Mr. Kent Burkett                      Brazoria County Groundwater Conservation District

Signed Ralph Crum  
Mr. Ralph Crum                      Brazos Valley Groundwater Conservation District

Signed Kathy Jones  
Ms. Kathy Jones                      Lone Star Groundwater Conservation District

Signed Bill Jacobs  
Mr. Bill Jacobs                      Lower Trinity Groundwater Conservation District

Signed John Martin  
Mr. John Martin                      Southeast Texas Groundwater Conservation District