The State of Groundwater Management Area 12

The members of Groundwater Management Area 12 (GMA 12) write to update the public and the Legislature of the progress made and process used in establishing Desired Future Conditions (DFCs) for the shared aquifers beneath all or part of fourteen Central Texas counties. Those counties include: Bastrop, Brazos, Burleson, Falls, Fayette, Freestone, Lee, Leon, Limestone, Madison, Milam, Navarro, Robertson, and Williamson. The five member Groundwater Conservation Districts (GCDs) within GMA 12 are: Brazos Valley, Fayette County, Lost Pines, Mid-East Texas, and Post Oak Savannah.

Established & Charged to Regionally Managed Aquifers

Senate Bill 1, passed during the 76th Legislative Session in 1997, established GMAs and charged them to "jointly plan and regionally manage the groundwater resources." GMA 12 manages seven deeper confined aquifers and one shallow unconfined river alluvium aquifer.

The confined aquifers occur between two layers of much lower permeability material, normally clay and have artesian pressure, causing the water level in a well screening the aquifer to rise above the low permeability stratum at the top of the aquifer. In ascending order, the confined aquifers occurring in all five GMA 12 member districts are the Hooper, Simsboro, Calvert Bluff, Carrizo (all commonly known as the Carrizo-Wilcox Group), Queen City, Sparta, and Yegua-Jackson. They all increase in depth as they dip downward toward the Gulf Coast. Because of the large area encompassed by GMA 12, not all of the aquifers are relevant within each of the GCDs in GMA 12. The one unconfined aquifer, the Brazos River Alluvium, is shared and cooperatively managed by Brazos Valley and Post Oak Savannah GCDs. The water level in a well screening an unconfined aquifer does not rise above the top of the aquifer. With an unconfined aquifer, the water pumped by a well comes directly from water stored in the aquifer in proximity to the well. With a confined aquifer, the pumping of a well reduces the artesian pressure near the well and at distance and causes water to flow to the well from some distance away. A very small amount of water in storage is removed with pumping in proximity to the well.

House Bill 1763, passed during the 79th Legislative Session in 2003, required GCDs to establish DFCs for each managed aquifer that are "feasible and compatible with the other districts." DFCs span a 50-year planning horizon and must be reviewed at least once every five years. Each GCD's Board of Directors establishes DFCs for their district, which must then be approved by 2/3 of the members of the GMA. Representatives of GMA 12 are tasked with also "adopting a GMA-wide DFC for each aquifer." GCDs are legislatively mandated to execute cooperative management of the aquifers, without exceeding the DFCs.

It is important to understand that this process is done transparently and solicits public input at every level. GMA 12 has enjoyed a vibrant DFC process with robust discussion and input from

environmental groups, water marketers, agricultural interests, industrial interests, public suppliers, and individual well owners.

Use of Best Science

GMA members are exhorted to use "best science" while formulating DFCs. During 2018, the groundwater availability model (GAM) for six of the seven confined aquifers in GMA 12 was recently updated. The Yegua-Jackson, a minor aquifer, was not included in the GAM update. The updated GAM was a financial partnership between the Texas Water Development Board (TWDB), GMA 12 members, Lower Colorado River Authority, Brazos River Authority, Environmental Stewardship, and the Colorado/Lavaca Rivers & Matagorda/Lavaca Bays Basin & Bay Area Stakeholders Committee at an approximate cost of $750,000. This cooperative group felt strongly that best science be employed when planning for future groundwater supplies and stream flow.

DFCs Are Data Driven

The DFCs for the GMA 12 confined aquifers are expressed as a reduction of artesian head or pressure over the 50-year period. In order to measure progress and avoid a violation of the DFCs, districts employ an extensive network of water level monitoring wells strategically located to best determine the extent of artesian head reduction. The data collection is done using a strict protocol thereby creating a trustworthy system/data base.

Desired Future Conditions Differ between Districts

The effects of pumping confined aquifers such as those in the Carrizo-Wilcox group can vary widely across the GMA and between districts. There are myriad reasons explaining the variances:

- Confined aquifers respond most to localized pumping with the artesian head decline significantly closer to the pumping center, and decreasing with greater distance from the pumping center.
- Location and amount of groundwater pumping drive the artesian head reduction across the GMA.
- The ability of an aquifer to transmit water, referred to as transmissivity, directly relates to the productivity of the aquifer. The transmissivity not only varies across the GMA, but can exhibit wide variations within a district, resulting in differences in aquifer response to pumping and thus groundwater availability.
- Geologic faults (sealing and non-sealing) are present in parts of GMA 12, and can have an impact on water movement and the ultimate resulting DFCs.
- Nine factors are statutorily prerequisite for consideration when setting DFCs. All are considered and of those, environmental impact, socio-economic impact, prevention of subsidence, and "other relevant information" are weighed district-by-district, as mandated by statute.

- DFCs can be influenced by groundwater/surface water interaction. Some river basins are more hydraulically connected to groundwater than others, directly affecting a DFC.
- Balancing highest practicable use and conservation, preservation, protection, recharging, and prevention of waste and subsidence can be different within the GMA, depending on numerous factors.
- If DFCs were required to be the same for each district, it could mean the modeled available groundwater (MAGs) for each district would be different and not necessarily appropriate for the aquifer conditions.
- If MAGs were the same for each district, it would require the DFCs be different in each district due to differing aquifer conditions.

Deliberative Results/Aquifers Managed to the DFC

As discussed above, GMA 12 members allow the groundwater models developed by the TWDB to calculate the MAG for each district within its jurisdiction. Member districts manage the aquifers based on the DFC, not the MAG. GMA 12 members are tasked with providing realistic pumping scenarios (actual historic pumping) and forecasting likely and reasonable future groundwater pumping amounts and locations, all under the watchful eye of the public, and other GMA representatives. Thorough debate and probing questions are asked and discussed in posted public meetings. This process is employed to insure thoughtful and deliberative results. This process occurs while considering the highest practical level of groundwater production balanced with the conservation, preservation, protection, recharging, prevention of waste of groundwater and control of subsidence. Consensus occurs only after GMA members are satisfied that data for GAM input and resulting pumping effects are acceptable.

State Water Plan & GMA Joint Planning Interrelated

The State Water Plan (SWP) is the template upon which GMA 12 planning is built. Both are reviewed, updated and revised every five years, and cover a 50-year planning horizon. The MAGs developed through joint DFC planning are integral to the SWP process. The SWP is premised on "what does the future hold and how do we get there?" The GMA process is premised on "what is the reasonable availability of groundwater when considering the nine factors and how will that fit into the SWP?"

The SWP is developed by 16 local Regional Water Planning Groups (RWPGs) across the state and are tasked with planning for unmet water needs over the next 50-year horizon. RWPGs identify these unmet needs by soliciting input from basin stakeholders. In other words, how much water are the stakeholders going to need to meet drought of record use? The GMAs consider projected groundwater demands within and outside the GMA based on stakeholder input.

Once needs are identified, RWPGs develop strategies to meet the needs, determining where the water will be developed. In the GMA 12 process, current and forecasted future pumping obtained through stakeholder involvement is input into the GAM, producing DFCs and resulting MAGs.

The ability of stakeholders to develop groundwater strategies to meet the guidelines of the SWP is dependent on the GMA MAGs, calculated by the TWDB.

Successful Planning Results

GMA 12 has successfully traversed two planning cycles in 2010 and 2016, and is currently in the third round of joint planning. Each round of planning required submission of DFCs to the TWDB for their review and determination of feasibility. Feasibility was affirmed by the TWDB in each planning round.

Chapter 36 requires rigorous transparency, public involvement and input, and provides an avenue for DFCs to be challenged. GMA 12 received a challenge to the adopted DFCs during the 2010 planning cycle and prevailed when reviewed and adjudicated by the TWDB. The member districts' diligence and deference to public involvement in GMA 12 has resulted in harmonious and positive results.

GMA 12 Commitment

We, the members of GMA 12, pledge to continue serving the groundwater community transparently, honestly, with open minds, always upholding our duty to conserve, preserve, and protect the aquifers, while allowing property owners the ability to access and beneficially use their valuable resource.

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Alan M. Day – Brazos Valley GCD

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David Van Dressar – Fayette County GCD

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