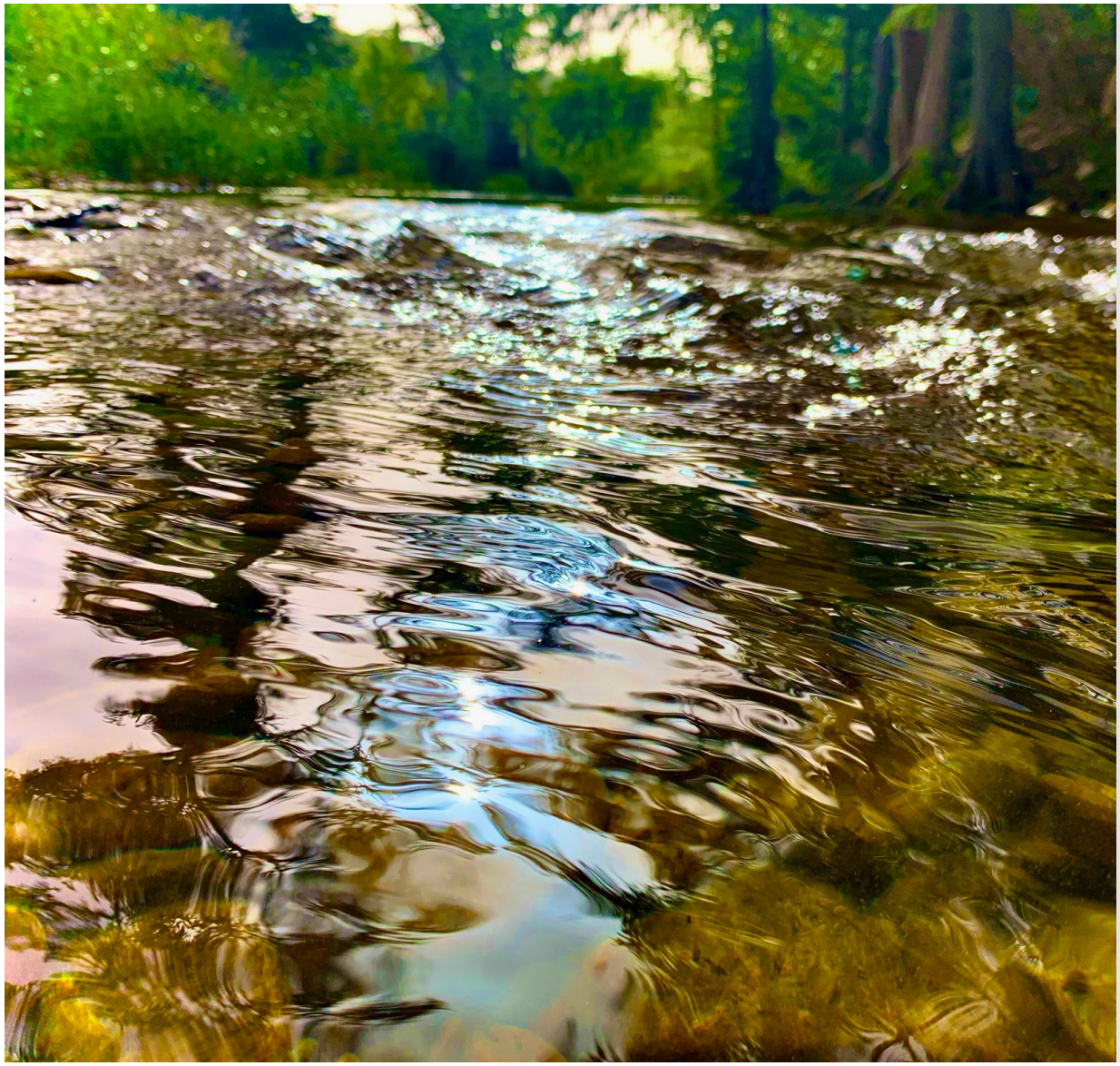


IMPROVING WATER PLANNING IN TEXAS

The Critical but Overlooked Link Between Desired Future Conditions and the State Water Plan

October 2023

Legislative History

SB 1 (1997) codified the state's preference for management of groundwater by local groundwater conservation districts (GCDs), while establishing regional and state water planning processes from a "bottom-up" approach.

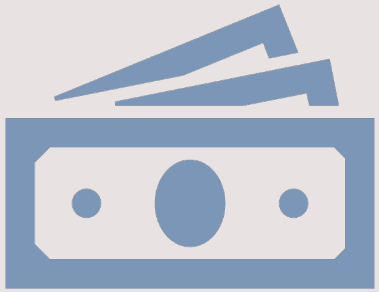
HB 1763 (2005) required GCDs over the same aquifer to participate in joint planning to develop Desired Future Conditions (DFCs)

SB 660 (2011) added nine elements for joint groundwater planning process consideration in development of DFCs to address a Sunset report concern: "…**evolving processes associated with groundwater affect the Board's ability to effectively conduct statewide water planning**… The idea behind joint planning is to get local groundwater districts to work cooperatively, using acceptable scientific information, to guide decisions about an aquifer's desired future condition."

Texas Water Code §36.108(d) – The Nine Elements

1. Aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another.
2. The water supply needs and water management strategies included in the state water plan.
3. Hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge.
4. Other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water.
5. The impact on subsidence.
6. Socioeconomic impacts reasonably expected to occur.
7. The impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Section 36.002.
8. The feasibility of achieving the desired future condition.
9. Any other information relevant to the specific desired future conditions.

What else happened in 2011 when SB 660 was enacted?



- The approved budget resulted in **significant reductions in available funding to the TWDB for groundwater** modeling and science.
- The Groundwater Availability Modeling Section was hit with about a 40 percent reduction in staffing, about a 50 percent reduction in modeling grants used to develop and improve models, and nearly a 60 percent reduction in its operating budget (such as travel).

Link between DFCs and State Water Planning

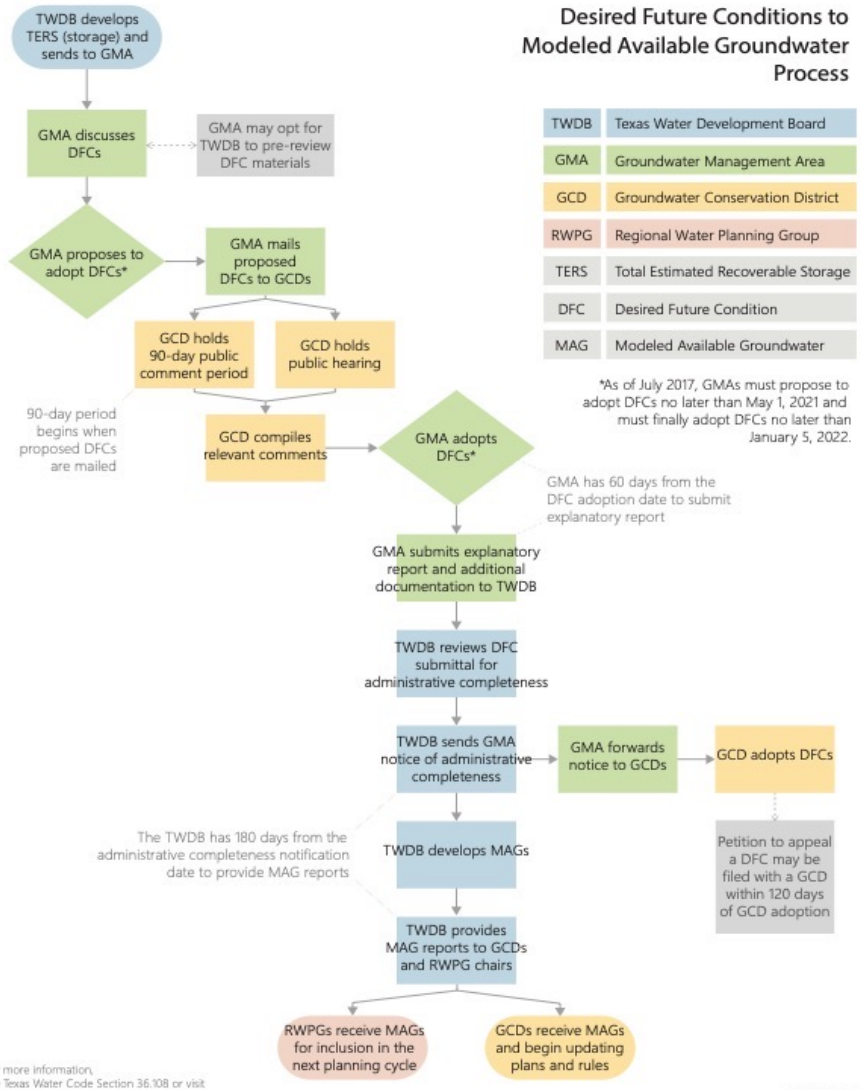
The long-term management goals or DFCs that GCDs adopt inform the availability of groundwater under the regional and ultimately the state water planning process.

The TWDB determines the boundaries of GMAs, which generally follow the hydrogeological boundaries of aquifers across Texas.

Together, GCDs within a GMA determine the desired future conditions for aquifers within their jurisdiction that are relevant to joint planning.

The TWDB uses the DFC to provide the modeled available groundwater (MAG) for the aquifer– the amount of groundwater that can be pumped and achieve the DFC – to GCDs and regional water planning groups.

Desired Future Conditions to Modeled Available Groundwater Process



Impacts on Water Planning

Despite Texas having a regulatory structure to manage groundwater, groundwater levels are declining in many aquifers across the state. According to a study conducted by the Texas Water Development Board, "[t]otal water-level declines in the state's aquifers since 1900 range from less than 50 feet to more than 1,000 feet.

The DFC process, which was meant to find a balance between the production and conservation of groundwater, has not resulted in groundwater levels being preserved.

Essentially, this means that "Texas plans to unsustainably produce groundwater from more aquifers in the future," and this will have profound consequences on water planning in Texas as additional unmet needs will be created.

Flaws in DFC Process

- A Lack of Refined, Local Models and Data
- Unbalanced Socio-Economic Analysis
- No Sustainable Yield Analysis
- One-Way Property Rights Analysis

A Lack of Refined Models and Data

- Consideration of local impacts is an inherent and important part of DFC development
- However, the GAMs were never designed to be utilized by GCDs for this type of local analysis
- Funding cuts to the GAM program have made it difficult for TWDB to update and refine GAMs for GCDs to utilize them for this purpose
- Real consideration of surface water-groundwater interactions is difficult for GCDs to make, as they lack highly refined models and local data needed to understand these interactions in a specific river basin.

Flaws in Modeling and Data – A view from the GMA perspective

GMA 3: modeling needs to be updated to better understand contributions to water levels from other water producing zones.

GMA 12: GAMS are not suitable for developing a quantitative relationship between pumping and groundwater-surface water exchange without refinement in their representation of changing surface water levels over time and subsequent validation using measured field data.

GMA 12 - groundwater availability models used to set the GMA 12 DFCs are suitable for developing some qualitative relationships between pumping and groundwater-surface water exchange. However, the GAMs are not suitable for developing quantitative relationship between pumping and groundwater- surface water exchange without refinement in their representation of changing surface water levels over time and subsequent validation using measured field data.

GMA 13: As discussed during GMA 13 meetings on November 8, 2019 and February 7, 2020, not all pumping inputs are realized in the final model outputs due to the model limitations.

Unbalanced Socio-Economic Analysis

- This consideration is important. It recognizes that because a DFC is ultimately connected to groundwater availability, it will have an economic impact on a community.
- Many GCDs rely exclusively on the socioeconomic analysis that TWDB provides to regional water planning groups to consider the socioeconomic impact of a DFC; however, this analysis was not designed to be used for groundwater planning
- This analysis does not include the socioeconomic impacts associated with declining aquifer levels from groundwater pumping and drought, which can result in local socioeconomic consequences, such as impacts to groundwater wells or recharge to rivers and streams.

A View from GMAs Regarding Socioeconomic Analysis

GMA 8: *While TWDB assessments are useful to understand the importance of meeting projected water needs, analyses do not evaluate socioeconomic impacts of proposed DFCs at the GMA level and a similar analysis does not exist.*

GMA 9: *This process, however, does not evaluate the socioeconomic impacts of the proposed DFCs at the GMA DFC joint-planning level. Because a similar quantitative tool does not exist to assess the socioeconomic impacts of the proposed DFCs, these discussions during the DFC joint-planning are qualitative considerations"*

GMA 15*: The TWDB prepared information for use by all regional water planning groups for the 2021 regional water plans, including Regions K, L, N, and P, the four regional water planning groups that cover some portion of GMA 15. However, these analyses* ***do not*** *evaluate socioeconomic impacts of DFCs at the GMA level.*

Property Rights – A One Way View

- Consideration is an extremely difficult one for GCDs to make and currently, for most GMA's is entirely a qualitative analysis.
- Without a quantitative analysis of how proposed DFCs will impact groundwater levels and in turn, the rights of landowners to conserve groundwater, GMAs are likely unintentionally, placing greater emphasis on the right to produce groundwater.
- As the Texas Supreme Court discussed in *Day*, "riparian rights are usufructuary, giving an owner only a right of use, not complete ownership;" therefore, "the non-use of appropriated waters is equivalent to waste." In contrast, "non-use of groundwater conserves the resource," and "[t]o forfeit a landowner's right to groundwater for non-use would encourage waste." Day at 842.
- One-way consideration of property rights has negative implications for water planning in Texas as it may lead to DFCs and MAGs that over prescribe the availability of groundwater for planning purposes.

A View from GMA's Regarding Property Rights Consideration

GMA 2 was one of the few GMAs that utilized a socioeconomic analysis to assist with the property rights consideration. This analysis, however, was limited to understanding how restrictions on pumping would negatively impact farmers' ability to produce, rather than how declining aquifer levels over time impact the property rights of all landowners over the aquifer, including those who may not want to produce.

Some GMAs strove to find a balance between "the highest practicable level of groundwater production and the conservation and preservation of groundwater and prevention of waste and subsidence," and argued that by achieving this balance, the property rights of landowners were considered. *GMA 7 & 12: The desired future conditions adopted … are consistent with protecting property rights of landowners who are currently pumping groundwater and landowners who have chosen to conserve groundwater by not pumping.*

No Sustainable Yield Analysis

- DFCs "must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater and control of subsidence in the management area."
- DFC process does not, however, require GCDs to evaluate how a proposed DFC will impact the sustainability of aquifers, which is important to achieving the balance required by statute.
- DFC process does require GCDs to consider the Total Estimated Recoverable Storage (TERS) of an aquifer.
- TERS does not include factors that would cause a GCD to implement regulations to conserve groundwater, or in other words, limit production from an aquifer.
- This results in an evaluation that is skewed toward production of groundwater rather than sustainability.
- To truly understand the impacts of a proposed DFC, GCDs need to know how much groundwater can be pumped from an aquifer without causing groundwater declines.

Closing Comments

GCDs are charged by statute to develop DFCs (TWC §36.108). As part of that process, GCDs are required to consider nine factors enumerated by statute. How well or poorly these considerations are incorporated in the development of the DFCs by the various GCDs can and does lead to poorly developed DFCs.

TWDB is forced to accept the DFCs adopted by the GCDs. The TWDB lacks authority to actively verify the strength of the DFC process, which can allow poorly developed DFCs to inform the planning process. Currently, the TWDB is limited to an administratively complete review of the submitted DFC documentation. A technical review by the TWDB of the underlying assumptions, data and science is currently not allowed nor taking place.

Poorly defined and supported DFCs lead to inaccurate MAG development by the TWDB.

Poorly developed DFCs and associated MAGs inaccurately inform groundwater management regulatory decisions and management plans.

Closing Comments

Poorly developed DFCs and MAGs inaccurately inform the TWDB's required review and approval of GCD management plans.

Poorly developed DFCs and MAG inaccurately inform funding considerations by the TWDB, specifically with respect to funding water strategies that could inadvertently create new unmet needs. This only serves to increase funding needed for additional water management strategies, thereby increasing the state's costs, which ultimately may get passed on to all Texans.

Ultimately, MAG development, water management and planning strategies, and funding water projects can be based on inaccurate DFCs over which the TWDB lacks authority. This jeopardizes the property rights of groundwater users and increases the cost of water planning to the state.

Recommendations

- The Legislature should appropriate additional funding to TWDB to develop more data and to update and refine Groundwater Availability Models. Additionally, TWDB should identify limitations in these models that today are being relied on to provide answers for which the models were never developed to address.
- Protection of surface water flows and existing surface water rights should be a much more integral component of groundwater availability discussions in the GMA process.
- The TWDB and the TCEQ should develop standard protocols that guide the incorporation of surface and groundwater resource data into the surface Water Availability Modeling (WAM) and Groundwater Availability Modeling (GAM) analyses. The agencies should also ensure that these and other water resource modeling tools accurately reflect the interconnectivity of the resources to the greatest degree possible given currently available data.
- With assistance from the legislature, the TWDB and the TCEQ should prioritize state funding for developing better science in areas with a strong degree of surface and groundwater interaction, including conducting streamflow gain-loss studies where adequate data is lacking and increasing long-term monitoring of springflows.

Recommendations

- More extensive narrative, modeling, quantitative analysis, and supporting documentation should be provided in explanatory reports as to how proposed DFCs will protect existing private property interests in groundwater in place within the GMA including the interest and desire to conserve the groundwater currently owned in place.
- The state should provide regional water planning groups with a socioeconomic analysis that evaluates impacts related to aquifer depletion or to put in another way, the socioeconomic benefits of managing water resources sustainably. This type of analysis would provide more balance to the planning process. Similarly, this type of analysis can help to incentivize the proper valuation and impacts to the area of origin, and in particular, to landowners impacted by groundwater development that affects an existing user's right to access and utilize their water.
- The Legislature should clarify and strengthen the authority that the TWDB has in conducting a meaningful review of the GCDs considerations of the 9 statutorily mandated criteria set forth in TWC §36.108 as it relates to the development of the DFCs.
- The Legislature should require the TWDB to model the sustainable yield of aquifers and require GMA to consider this volume when adopting DFCs.