

How will the Texas Water Development Board Support Development of Desired Future Conditions Statements and Review Desired Future Conditions Submittals?

Texas Water Code § 36.108 requires groundwater conservation districts to submit desired future conditions of groundwater resources in their groundwater management area to the executive administrator of the Texas Water Development Board (TWDB). The TWDB revised the Texas Administrative Code Chapter 356 groundwater management rules to reflect statutory changes made during the 82nd Legislature. As part of the joint planning efforts related to proposing desired future conditions, districts in a groundwater management area need to consider several items. These include aquifer uses or conditions, water supply needs and water management strategies in the state water plan, and hydrological conditions including the total estimated recoverable storage as provided by the TWDB.

What is total estimated recoverable storage, and how will it be estimated?

Total estimated recoverable storage is the total amount of water that can be feasibly extracted from the aquifer. We will use the appropriate groundwater availability model (or best available tool) to develop the recoverable storage estimates and provide the estimates to the groundwater conservation districts in each groundwater management area.

Total estimated recoverable storage will be estimated for the portion of the aquifer within the official lateral aquifer boundaries as published in TWDB Report No. 380 (Aquifers of Texas). To estimate the volume of confined aquifers, we will take the defined surface and subsurface area of the aquifer and project this area vertically downward to intersect the upper and lower limits of the aquifer layer. The estimate may also include the volume of confining units depending on the configuration of the model layers and the level of hydrostratigraphic detail that is incorporated in the model layers. The model layer architecture may be different than the aquifer vertical stratigraphic boundaries. Where differences exist the estimate will reflect the model layer architecture. Total estimated recoverable storage values may include a mixture of water quality types, including fresh, brackish, and saline groundwater. The available data and the scope of the groundwater availability models do not permit the differentiation of different water quality types.

We will provide districts in each groundwater management area with an explanation of the methods, assumptions, and conditions used in the development of their total estimated recoverable storage value(s).

What is a “relevant” aquifer? Can desired future conditions be adopted for an aquifer that is not a relevant aquifer?

Relevant aquifers are the major and minor aquifers identified in TWDB Report No. 380 unless designated otherwise by districts in a groundwater management area (see next section). Districts may also propose desired future conditions for other aquifers, geologic strata, and groundwater resources that are not major or minor aquifers, thereby making them relevant for joint planning purposes. The groundwater management area coordinator should submit a request to the TWDB to calculate the total estimated recoverable storage. The name of the aquifer or any subdivision should be clearly identified. Establishing a desired future condition for an aquifer, geologic strata, or groundwater resource that is not currently a major or minor aquifer does not mean that it will be officially designated as a major or minor aquifer in the future. Once an aquifer is relevant for joint planning purposes, the requirements of Texas Water Code § 36.108 (d) will be applicable in proposing desired future conditions for adoption.

How is an aquifer designated as “non-relevant?”

Districts in a groundwater management area may classify all or portions of a relevant aquifer as non-relevant if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition. The districts must submit the following documentation to the TWDB for the portion of the relevant aquifer proposed to be classified as non-relevant:

- 1) A description, location, and/or map of the aquifer or portion of the aquifer.

- 2) A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifers will not be affected.
- 3) An explanation of why the aquifer or portion of the aquifer is non-relevant for joint planning purposes.

How will TWDB staff identify the boundaries of aquifers? What if there is a difference between the boundary of the aquifer as identified in TWDB Report No. 380 (Aquifers of Texas) and the modeled boundary of the aquifer?

The boundaries of the major and minor aquifers are defined in TWDB Report No. 380. These are the boundaries TWDB will use as a guide for developing estimates of total recoverable storage and modeled available groundwater. The modeled area of an aquifer may be different from the aquifer area identified in TWDB Report No. 380. This is because the model boundary is a discrete representation of a continuous physical surface. In some cases, a minimum thickness was used in the models, typically where the aquifer is less than around 100 feet thick. This was done to help stabilize the model and improve model convergence. In addition, the down-dip boundaries of aquifers are typically defined based on water quality data (often the estimated extent of water up to 3,000 milligrams per liter total dissolved solids) whereas the modeled down-dip boundary usually extends deeper into geologic formations with poorer quality waters. The groundwater availability model reports will provide details on the model boundary limits and how they are defined. In dipping aquifers, we will use the same assumptions for estimated modeled available groundwater as were discussed above for estimated total recoverable storage (for example, project the surficial aquifer boundary vertically downward to intersect the upper and lower limits of the aquifer layer) unless the desired future condition resolution states otherwise. Some estimates of modeled available groundwater for relevant aquifers will use a combination of analytical and numerical model approaches.

How should the desired future condition statement be expressed? What planning horizon will be considered in estimating the modeled available groundwater?

The desired future conditions statement is a quantitative description of the groundwater resources in a management area at one or more specified future times. We suggest that the desired future conditions statement include the following elements.

Identify the aquifer: The statement should identify the "relevant" aquifer(s) as identified in TWDB Report 380. If portions of the aquifers are declared as non-relevant then this needs to be described, as well as if the boundary desired extends beyond the boundaries noted in TWDB Report 380. As noted above, other aquifers, geologic strata, and groundwater resources that are not major or minor aquifers that are considered a relevant aquifer should be clearly identified. In addition, districts may prepare desired future conditions statements for subdivisions of aquifers and may also prepare statements that address conditions in specified geographic areas. If a district wants to establish a desired future condition for a portion of a relevant aquifer that is outside the official aquifer boundary, then the desired future conditions resolution should explicitly state this.

Identify the baseline: Desired future conditions statements are often expressed in terms of an acceptable change in conditions, such as water-level declines in an aquifer within a defined area at some point in the future. These statements should define the baseline condition (for example, water levels in a selected year) from which these changes (for example, drawdowns) are anticipated. This baseline year must be sometime in the past and should not be the current year or sometime in the future. Most groundwater availability models are based on average annual conditions and were calibrated using water level measurements from the winter months.

Identify the time: The modeled available groundwater values that are derived from the desired future conditions statements will be used by regional water planning groups to support statewide water planning. The planning groups express their planning efforts in 10-year increments extending at least 50 years in the future. To ensure consistency with the state water planning efforts, we suggest that a desired future conditions statement apply to at least a 50-year planning horizon that corresponds with the regional water planning groups' planning cycle. If a desired future condition statement does not fully encompass the planning period, the modeled available groundwater values for the end of the statement will be used for the unspecified planning period.

May districts in a groundwater management area provide groundwater model files to the TWDB? How will they be processed?

Districts may want us to calculate modeled available groundwater values using model files used by the districts during joint planning efforts. To assist districts in the preparation and submittal of model files, we have published “How to Submit a Groundwater Availability Model Run or Aquifer Assessment for the Development of Modeled Available Groundwater” that is available on the TWDB website (http://www.twdb.texas.gov/groundwater/docs/Guidelines_Submit_Model_Runs_for_DFCs_October_2012.pdf). We will work with the districts to replicate the desired future conditions and the modeled available groundwater values as much as practicable and within schedule constraints. However, if there are significant problems in duplicating the work, we may need to use a different approach with different results to generate the modeled available groundwater values.

For information on how and where to submit desired future conditions statements, please refer to the document “How to submit desired future conditions to the Texas Water Development Board” on the TWDB website (<http://www.twdb.texas.gov/publications/shells/HowtoSubmitDFC.pdf>).