

Questions and Answers for Marathon Aquifer GAM
Stakeholder Advisory Forum 1
January 14, 2025
Marathon Elementary School
Marathon, Texas

1. Is water from the Marathon Aquifer being used outside of the aquifer footprint?

The vast majority of water from the Marathon Aquifer is used here in Marathon. The Marathon Aquifer is a self-contained area and water is not being sold outside of the area.

2. Is the Marathon Aquifer confined?

No, not all of the aquifer area is confined because the Marathon Aquifer consists of multiple geologic units. Portions of the aquifer are confined, though it is mostly an unconfined aquifer.

3. How do you determine the groundwater flow direction?

Groundwater flows from high water-level elevation areas to low water-level elevation areas. We interpolated water levels from well data and then drew the groundwater flow directions perpendicular to the water-level elevation contours.

4. Are the groundwater elevation contours just representing the Marathon limestone units?

No, the water-level elevation contours represent the shallowest saturated geologic unit that wells with water level data are completed in, so the map represents the interpreted water table across multiple geologic units.

5. For the water-level elevations, is this water on the ground?

No, this water is underground.

6. Is water flowing horizontally from an aquifer to an aquitard to another aquifer?

Yes, there appears to be enough fracturing in these geologic units to allow for water to flow between them.

7. Where is the precipitation data from?

The precipitation data was collected from local weather stations like the one in Marathon. These values are then interpolated between stations to cover the entire model footprint. This approach

is not perfect since precipitation is often variable across any area from any given precipitation event, however we have to work with the data we have.

8. Is recharge for the Marathon Aquifer mostly from precipitation?

Yes.

9. Would spring flow return to the aquifer, or where does it go?

It is possible that some spring flow could recharge (return to) the aquifer, but it is more likely that most or all of the spring flow is lost to evaporation and evapotranspiration to plants in the vicinity of the spring.

10. Who is paying for this model?

The Texas Water Development Board is funding this modeling project as part of their Groundwater Modeling program effort to model all designated major and minor aquifers in the state of Texas.

11. For the transient model, will the results be presented on a finer timescale, such as annually or monthly?

Yes, results will be presented using annual periods (called stress periods). In the model, there will be multiple time-steps per stress period.

12. Many of the domestic wells around town have been capped, but you see vegetation around these wells. Do we know anything about these or their history on why they are capped?

Many of these capped domestic wells are not deep and are completed in the alluvium, which is a shallow geologic unit. Saturation in the alluvium can fluctuate significantly depending on precipitation, and if it doesn't rain for a few years the well might go dry. These wells might have been capped for this reason, although the water may return in time. Wells drilled deeper than the alluvium are not as sensitive to the occurrence of precipitation.

13. How far do you recommend drilling to go beyond the alluvium?

Below at least 200 feet would be suggested, but it should be looked at on a case-by-case basis.

14. Why are we doing this model? Would this open us up to water producers who would then sell our water to other places?

No, these studies are to better understand the aquifer system and are required by legislative statutes put in place years ago. All major and minor aquifers must have an associated GAM, and although this is the smallest aquifer in Texas, we have to fulfill the requirement. Permits to

export water from the Marathon Aquifer would have to be approved by the Brewster County Groundwater Conservation District (GCD). Brewster County GCD could use this model to set strict desired future conditions that would not allow for producers or water providers to export water from the aquifer. This model could provide the scientific justification for GCD decisions.

15. What is the model grid size?

The model grid size is currently expected to be 1/8 mile by 1/8 mile, or about 2,000 feet square.

16. Are there any hydrocarbons here?

No, not here.

17. What places, cities, and town are located within the aquifer footprint?

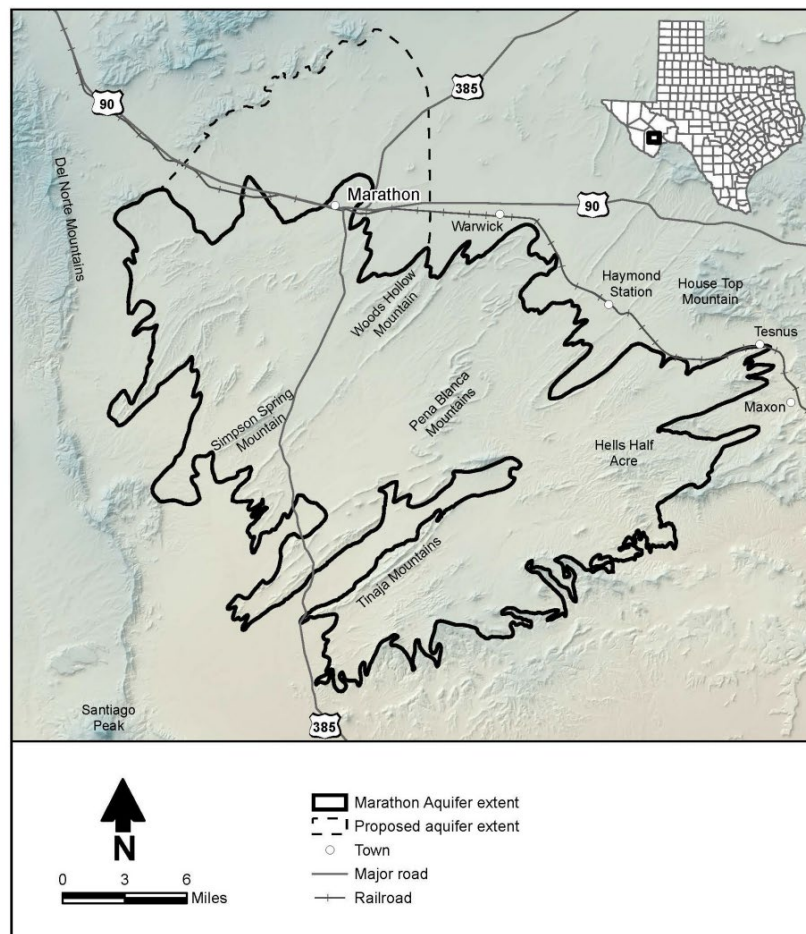


Figure 1-1 from the conceptual model report (Blandford and others, 2022).

18. Where do the water use numbers come from?

Water users are required to report water use to the Texas Water Development Board. The water use numbers in this presentation were collected from the Texas Water Development Board Water Use Survey database.

19. How was the aquifer boundary determined?

The aquifer boundary mostly follows the Marathon Limestone and alluvium extents within the Marathon Basin mapped by the United States Geological Survey. However, we know it is likely not a definitive/hard boundary at some places, and the Conceptual Model study suggested extending the northern boundary of the Marathon Aquifer.