To the Lone Star Groundwater Conservation District, Groundwater Management Area 14 Representatives, and the Texas Water Development Board:

This submission constitutes my public comment on the Proposed Desired Future Conditions (DFCs) for Groundwater Management Area (GMA) 14, submitted during the formal public comment period open from May 5, 2026, through August 11, 2026.

My name is Benjamin Slotnick, PhD. I am a Montgomery County resident and geologist, although I am not a State of Texas licensed hydrologist or hydrogeologist. I submit these comments as a consolidation and continuation of the technical concerns I have raised throughout the current GMA 14 groundwater planning and model-review process.

I want to begin by recognizing the substantial work that has gone into developing, calibrating, reviewing, and discussing the GMA 14 groundwater model. I also specifically appreciate the groundwater conservation districts and others who supported bringing Dr. Bill Hutchison into this process to provide an independent technical review. That was an important and constructive decision, and his initial work has already provided valuable additional insight into the model.

At this stage, my principal request is straightforward: Dr. Hutchison should be provided adequate time, access, and opportunity to complete the independent technical work he has begun before the model and the groundwater-availability conclusions underlying the proposed DFCs are treated as sufficiently resolved. His review should not be prematurely curtailed simply to satisfy an administrative or model-completion deadline.

There is only so much an independent expert can reasonably accomplish during a relatively quick review of a regional groundwater model of this size and complexity. Dr. Hutchison has already begun identifying potentially consequential questions involving vertical connectivity, water budgets, Catahoula-derived inflow, and other aspects of model behavior. Those findings should be followed to technical resolution.

Vertical Hydraulic Connectivity Remains My Central Technical Concern

My primary concern since January 2026 has been whether the model accurately represents vertical hydraulic connectivity among the Chicot, Evangeline, Jasper, and Catahoula aquifers, particularly whether simplification and averaging of the subsurface have made the modeled system artificially open in the vertical direction.

The Gulf Coast aquifer system is not simply a vertically connected stack of clean sand bodies. It is a highly heterogeneous, mud-dominated stratigraphic system containing sands interbedded with thick clay- and mud-rich intervals that create substantial resistance to vertical groundwater movement. Of particular importance here is the Burkeville confining unit and the broader confining stratigraphy separating the Catahoula from the overlying aquifer system.

The GMA 14 model appears to be calibrated. I have acknowledged that throughout this process. The more important question is whether it is calibrated for the correct physical reasons.

Calibration and conceptual correctness are not necessarily the same thing. A groundwater model can reproduce historical groundwater levels while achieving part of that calibration through compensating parameters or hydraulic processes that do not accurately represent the physical subsurface. That distinction becomes especially important when the model is then used to project groundwater behavior decades into the future.

When a highly heterogeneous stratigraphic section containing sands, clays, mudstones, and confining intervals is simplified into broad regional model layers and represented through averaged effective hydraulic properties, some of the actual vertical resistance created by the fine-grained stratigraphy can be lost. The numerical model can consequently become more hydraulically open vertically than the physical groundwater system.

Water and hydraulic pressure may then move numerically between model layers more readily than the actual geology permits. In effect, a groundwater system containing meaningful vertical confinement can begin behaving numerically more like a broadly interconnected reservoir.

If this is occurring, the implications extend directly to groundwater availability. Excessive vertical connectivity can provide artificial hydraulic support to pumped aquifers, reduce simulated drawdown, understate depletion within individual units, and make the regional aquifer system appear more resilient to sustained pumping than it actually is.

The Modeled Catahoula Contribution Is a Critical Example

Dr. Hutchison's initial independent review appears to have identified a particularly important example of the concern I have been raising.

As I understood his presentation, approximately one-quarter to one-third of modeled recharge or inflow supporting portions of the Jasper and Evangeline aquifers may ultimately be derived from the underlying Catahoula. I characterize that percentage as approximate because the important issue is not whether the precise value is 25%, 30%, or 33%; it is the magnitude of the modeled contribution and what it may reveal about the model's representation of the subsurface.

This finding is particularly important because of the Burkeville confining unit and associated mud-rich stratigraphy between the Catahoula and the overlying aquifer system.

The question is not whether absolutely zero leakage can ever occur through low-permeability material. The question is whether anything approaching the magnitude and timescale of hydraulic support represented in the model is physically realistic given the intervening confining geology.

Put more directly:

If the Burkeville and associated mud-rich stratigraphy are functioning as effective confining intervals, how can approximately one-quarter to one-third of the modeled support to portions of the Jasper and Evangeline ultimately be coming from the underlying Catahoula?

That requires a compelling physical explanation.

Is this modeled contribution supported by measured hydraulic gradients, field observations, aquifer-test information, leakage estimates, or other hydrogeologic evidence? Or is some substantial portion of it an artifact of how the subsurface has been simplified, parameterized, and vertically averaged in the model?

This is not a minor distinction.

If broad regional layering and averaged hydraulic properties have reduced the effective resistance of the intervening confining stratigraphy, the model may be creating vertical hydraulic pathways that are substantially more efficient than those present in the actual subsurface. The Catahoula can then numerically provide water or pressure support to the Jasper and Evangeline at a magnitude that the physical system may not be capable of transmitting.

If that is occurring, the modeled Catahoula contribution is not simply evidence of natural vertical exchange. It could represent, in whole or in part, a numerical artifact produced by simplification, averaging, parameterization, or inadequate representation of confining resistance.

The consequence is significant. The model could effectively create a source of hydraulic support that does not exist at anything approaching the same magnitude or timescale in the actual groundwater system. Under pumping stress, that support could reduce simulated drawdown, reduce apparent depletion, make pumping impacts appear less severe, and increase apparent groundwater availability.

That possibility needs to be resolved before the model is relied upon for long-term DFC decisions.

Calibration Does Not Resolve the Catahoula Question

This example also demonstrates why calibration alone cannot resolve the concern.

If the model has excessive vertical connectivity because of averaging or parameterization, Catahoula-derived water can become a compensating mechanism within the numerical model. Historical groundwater levels may still be reproduced because water is being allowed to move vertically through the model more readily than it can through the actual subsurface.

A good calibration statistic does not necessarily identify that problem.

The relevant question is therefore not simply whether the model reproduces historical groundwater levels. It is whether the model reproduces those observations through physically realistic hydraulic processes.

Dr. Hutchison's preliminary identification of a potentially large Catahoula contribution is important because it appears to provide a concrete model behavior consistent with the vertical-connectivity concern I raised before his independent review began.

That observation does not, by itself, prove that the entire model is incorrect. It does, however, provide a specific and consequential question that now needs to be resolved.

How will this issue be properly resolved now when it was not resolved earlier in the GMA 14 review process?

Earlier this year, I specifically requested sensitivity testing aimed at determining whether vertical transmissivity and cross-aquifer communication were being represented realistically. Dr. Hutchison's review has now identified model behavior that makes completing that analysis even more important.

Dr. Hutchison's Hydrograph Review Was Useful but Did Not Resolve Much Given the Time Constraints of his Review

Dr. Hutchison also performed a preliminary review of the model hydrographs. I found that review useful because it provided another independent examination of how the model compares with observed groundwater-level behavior.

However, that review did not resolve much with respect to the broader question I continue to raise: whether the model permits too much vertical hydraulic communication between aquifers.

Hydrographs are an important diagnostic, but by themselves they do not establish whether a model is reproducing groundwater levels for the correct physical reasons. A model can reasonably match observed groundwater-level trends while compensating through parameterization or excessive hydraulic connectivity elsewhere in the system.

For that reason, I view Dr. Hutchison's hydrograph review as useful supporting work, but not as resolution of the vertical-connectivity issue.

The more direct evidence lies in the model's water budgets, the potentially substantial Catahoula contribution to the Jasper and Evangeline, the hydraulic behavior of the Burkeville and other confining intervals, and the model's response when vertical hydraulic properties are varied.

Dr. Hutchison's preliminary hydrograph work should therefore be considered alongside those other diagnostics rather than treated as resolving the broader conceptual concern.

Sensitivity Testing Provides a Direct Way to Resolve the Question

The most direct way to evaluate this concern is through structured sensitivity testing of the model's vertical hydraulic properties.

Alternative scenarios should reduce effective vertical hydraulic conductivity and transmissivity across the Burkeville and other mud-rich confining intervals within reasonable geologic ranges and determine how the model responds.

At a minimum, that testing should determine:

1. How much of the modeled Catahoula contribution to the Jasper and Evangeline remains as vertical resistance increases;
2. How the individual aquifer water budgets and vertical leakage fluxes change;
3. Whether projected drawdown in the Jasper and Evangeline increases;
4. Whether the model's cross-aquifer hydraulic behavior changes materially;
5. How the proposed DFC results change; and
6. Whether the resulting estimate of groundwater availability changes materially.

This provides a direct test of the concern.

If substantial Catahoula support persists when the confining geology is represented through reasonable alternative vertical hydraulic properties, and that support can be reconciled with measured hydraulic gradients and independent hydrogeologic evidence, documenting that result would strengthen confidence in the model.

If, however, the Catahoula contribution substantially decreases when vertical resistance is increased to better represent the confining stratigraphy, and projected drawdown correspondingly increases, that would indicate that the model's original groundwater-availability projections are materially dependent upon its representation of vertical connectivity.

Either result is valuable.

What is not satisfactory is leaving the question unresolved.

Dr. Hutchison Should Be Given Time to Finish the Work

This is why the timing of the independent review matters.

There is an important distinction between giving an independent expert enough time to identify potentially consequential model behavior and giving that expert enough time to determine its significance.

Dr. Hutchison has already begun examining the Catahoula contribution, water-budget relationships, hydrographs, vertical connectivity, and other aspects of a complex regional groundwater model. There is only so much depth that can reasonably be achieved across each of these subjects during a limited review period.

The fact that an independent reviewer could begin examining the model and identify something as potentially consequential as approximately one-quarter to one-third of modeled support to portions of the Jasper and Evangeline potentially coming from the underlying Catahoula is a reason to continue the review, not conclude it.

Dr. Hutchison should have sufficient time, access, and opportunity to determine whether that modeled contribution is physically defensible or instead reflects excessive vertical connectivity created by the model's representation of the subsurface.

If additional weeks or months are required, that is a relatively small investment compared with the decades of groundwater-management decisions that may rely upon this model.

I was encouraged when the participating groundwater conservation districts brought Dr. Hutchison into this process. Now that his independent review has begun identifying substantive questions, he should be allowed to follow those questions wherever the technical analysis leads.

The independent review should reach technical completion, not merely calendar completion.

Post-2019 Water Levels Provide an Independent Test of the Model

I also want to clarify my previous comments regarding post-2019 groundwater-level data.

Earlier in this process, I expressed concern that the model relied heavily on information ending around 2019 even though groundwater conditions in portions of Montgomery County have changed materially since then.

I recognize that post-2019 observations do not necessarily need to be incorporated into the model's original calibration. In fact, because these observations fall outside the calibration period, they provide an especially useful opportunity for independent model validation.

The model should be tested against actual post-2019 groundwater-level behavior and, where appropriate, pumping conditions through hindcasting, forward validation, or scenario analysis.

The question is straightforward: Can the model reasonably reproduce groundwater behavior that it was not calibrated to match?

If it can, confidence in the model's predictive capability increases. If it cannot, the discrepancies may help identify assumptions or physical processes requiring further investigation.

Either outcome provides useful information about the model's ability to predict future conditions.

Reliable Water Supply Requires a Physically Reliable Model

I agree with the elected officials, groundwater districts, municipalities, and other stakeholders who have emphasized the importance of ensuring adequate and dependable water supplies for Montgomery County and surrounding communities. Continued growth requires reliable water resources.

My comments are not an argument against growth or against producing the groundwater necessary to support our communities.

They are an argument for making sure the amount of groundwater we believe can be produced is based on a physically defensible model.

Groundwater availability depends upon withdrawals, recharge, storage, and hydraulic exchange throughout the aquifer system. Increasing a production target does not itself create additional groundwater. It changes how much groundwater the planning process assumes can be produced while remaining within the adopted management framework.

I understand the policy rationale surrounding discussions of production approaching approximately 200,000 acre-feet per year and the use of a 70% drawdown framework. But any production target is only as defensible as the model used to estimate its consequences.

If the model correctly represents vertical hydraulic resistance, storage, recharge, aquifer interaction, and pumping response, additional testing should reinforce its conclusions.

If, however, the actual confining stratigraphy substantially restricts hydraulic communication from the Catahoula while the numerical model allows the Catahoula to provide a major portion of the modeled support to the Jasper and Evangeline, then the model may be creating apparent groundwater availability through numerical connectivity that the physical system does not possess.

In that circumstance, even a seemingly conservative drawdown framework could produce an overly optimistic real-world result.

Requested Actions Before the Proposed DFCs Are Finalized

For these reasons, I respectfully request that Lone Star GCD, the other participating groundwater conservation districts, GMA 14 representatives, and the Texas Water Development Board support completion of the independent technical review before these principal uncertainties are treated as resolved.

Specifically, I request that:

1. Dr. Bill Hutchison be provided adequate additional time, access, and opportunity to complete his independent technical review, including follow-up analyses arising from the issues he has already identified.
2. The modeled Catahoula contribution to the Jasper and Evangeline be specifically investigated and resolved, including the approximate one-quarter to one-third contribution identified during Dr. Hutchison's preliminary review, the hydraulic pathways responsible for that result, and the hydrogeologic evidence supporting its magnitude.
3. The hydraulic effectiveness of the Burkeville and associated mud-rich confining stratigraphy be explicitly tested, including whether the model's representation of those units provides realistic resistance to vertical flow.
4. Vertical hydraulic connectivity be subjected to explicit sensitivity testing, including reasonable alternative assumptions for vertical hydraulic conductivity, vertical transmissivity, anisotropy, and confining-unit properties.

5. Those sensitivity scenarios determine how increased vertical resistance affects Catahoula-derived support, aquifer water budgets, vertical leakage, projected drawdown, proposed DFC outcomes, and groundwater availability.
6. Dr. Hutchison's preliminary hydrograph review be considered alongside the broader vertical-connectivity analysis, recognizing that it was useful but did not resolve whether the model's cross-aquifer hydraulic communication is physically realistic.
7. Post-2019 groundwater-level observations be used as an independent validation dataset, including hindcast, forward-validation, or other technically appropriate testing.
8. The results of these analyses be transparently documented and made available for technical and public review before consequential long-term groundwater-planning decisions based upon the model and proposed DFCs are finalized.

Conclusion

These comments are not intended as an attack on Lone Star GCD, GMA 14, the model developers, or the substantial modeling effort that has already occurred. They are a request to finish the technical process that has now begun.

Earlier this year, I raised a specific concern that simplification and averaging of a highly heterogeneous, mud-dominated subsurface could make the model too hydraulically open vertically. I requested sensitivity testing to determine whether that concern was valid.

Since then, participating groundwater conservation districts took the constructive step of bringing Dr. Bill Hutchison into the process as an independent expert. I appreciate that decision.

His preliminary review appears to have identified a potentially concrete expression of the same concern: a substantial modeled contribution from the underlying Catahoula to portions of the Jasper and Evangeline despite the intervening confining stratigraphy.

His hydrograph review was also useful, although it did not resolve much regarding this central issue.

The Catahoula finding, however, deserves to be followed through.

If the actual confining stratigraphy substantially restricts hydraulic communication from the Catahoula, but the numerical model allows the Catahoula to provide a major portion of the modeled support to the Jasper and Evangeline, then the model may be creating groundwater availability through numerical connectivity that the physical groundwater system does not possess.

That possibility goes directly to projected drawdown, groundwater availability, and the reliability of the proposed DFCs.

It should be tested, not assumed away.

If additional analysis validates the existing model behavior, it will strengthen the model and confidence in the proposed DFCs. If the analysis identifies a material problem, it is far better to understand and correct it now than after long-term groundwater-production decisions have been made.

The purpose of independent technical review should be to identify and resolve precisely these types of questions. Once potentially consequential model behavior has been identified, the review should not end simply because the original schedule has reached its deadline.

GMA 14 is making decisions that may influence groundwater production and aquifer conditions for decades. Against that timeframe, providing an independent expert additional time to fully investigate a potentially fundamental model issue is a small investment.

The fact that potentially consequential questions are emerging from a limited independent review is a reason to investigate further, not a reason to stop.

The deadline for completing the model should not become the reason a potentially fundamental problem in the model's representation of the subsurface remains unresolved.

Please allow Dr. Hutchison's independent review to reach technical completion, not merely calendar completion, before this model and the proposed DFCs become the foundation for consequential long-term groundwater-management decisions.

Thank you for your consideration.

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Montgomery County Resident