

Groundwater Management Area 9

2022 DFC Joint Planning Cycle

March 22, 2021

GMA 9 2022 DFC Joint Planning Cycle

For Today's Meeting:

- Discuss and consider adopting proposed non-relevant aquifer classifications pursuant to Title 31, Texas Administrative Code § 356.31(b) and proposed desired future conditions pursuant to Texas Water Code § 36.108(d). (*Agenda Item 9*)
- Discuss and consider public comment process for desired future condition public hearings. (*Agenda Item 10*)

GMA 9 2022 DFC Joint Planning Cycle – Process/Schedule Update

GMA 9 Joint Planning Process Schedule – Revised 3/22/21

Task	Estimated Completion
GMA 9 meeting – Review project approach and timeline; present report on requirements of Texas Water Code § 36.108; and review previous GAM runs and DFCs and proposed non-relevant aquifer classifications.	November 18, 2019
GMA 9 meeting – Provide project update; discuss DFC statements; discuss possible non-relevant aquifer classifications; and present report regarding Texas Water Code §§ 36.108(d)(1) – 36.108(d)(5) and discuss first five of nine factors.	December 14, 2020
GMA 9 meeting – Provide project update; discuss possible proposed non-relevant aquifer classifications; discuss and identify DFCs to be proposed by GMA 9; and present report regarding Texas Water Code §§ 36.108(d)(6) – 36.108(d)(9) and discuss four remaining factors.	January 25, 2021
GMA 9 meeting – Consider action to approve proposed non-relevant aquifer classifications and adopt proposed DFCs ¹ , and to distribute both to the GCDs in GMA 9. <i>Action to approve proposed DFCs for distribution to GCDs must be by 2/3 vote of GMA 9.</i>	March 22, 2021
90-day public comment period on proposed non-relevant aquifers and DFCs – Hold public hearings and make available information used to develop these proposals including how nine factors are considered in developing proposed DFCs.	April 1 – June 30, 2021
GCDs compile public comments received during public comment period and prepare GCD summary reports.	August 2021
GMA 9 meeting – Review GCD public comment summaries and GCD suggestions to modify proposed revisions to DFCs, if applicable, based upon public comments.	September 2021
First GMA 9 Meeting – Review and discuss complete draft explanatory report.	October 2021
Second GMA 9 meeting – Consider action to adopt final DFCs ² , non-relevant aquifer classification proposals, and explanatory report. <i>Action to approve proposed DFCs must be resolution adopted by 2/3 vote of GMA 9.</i>	
Prepare and submit DFCs and explanatory report to TWDB and to each GCD. <i>Submission packet due to TWDB within 60 days of action to adopt DFCs.</i>	November 2021

¹ Texas Water Code § 36.108(d) deadline for GMA to adopt proposed DFCs is May 1, 2021

² Texas Water Code § 36.108 (d-3) deadline for GMA to adopt final DFCs is January 5, 2022

TWC § 36.108(d) Nine Factor Consideration

Feasibility of Achieving the DFC

DFC Feasibility Factor

Before adoption of DFCs, GCDs shall consider groundwater availability models and other data or information for the management area and consider nine factors including the feasibility of achieving the desired future conditions(TWC § 36.108(d)(8)).

Considerations

- TWC and TAC do not provide guidance on how GMAs and GCDs are to consider this factor.

TWC § 36.108(d) Nine Factor Consideration

Feasibility of Achieving the DFC

Is it feasible to achieve the DFC in the aquifer?

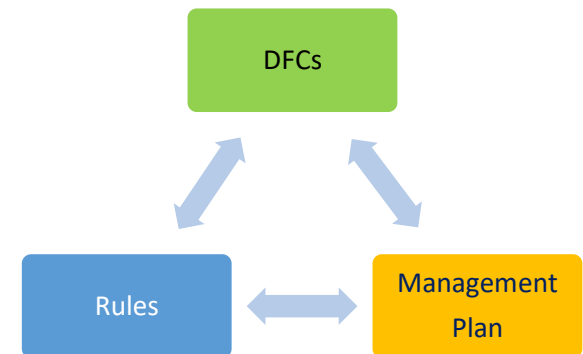
Groundwater Availability Models help ensure that DFCs are generally physically achievable in the aquifer and represent the best available science according to TWDB declaration.

DFCs compliance is determined by assessing actual aquifer conditions.

Is it feasible to achieve the DFC from a regulatory standpoint ?

Adopted Rules and Management Plans in each district help ensure that DFCs can be achieved.

DFCs are less likely to be achieved in areas without GCDs.



TWC § 36.108(d) Nine Factor Consideration

Feasibility of Achieving the DFC

DFC Feasibility Factor

- ✓ Chapter 36 gives GCDs authority to manage aquifers locally and jointly.
- ✓ GCDs continue to collect data and improve science and understanding of the aquifer.
- ✓ GCDs have monitoring plans to track status of aquifers compared to DFCs.
- ✓ GCDs set goals and objectives in TWDB-approved management plans.
- ✓ Based on the best available science (the approved Groundwater Availability Model or other quantitative tools), the DFCs are physically possible.
- ✓ Modeled Available Groundwater (MAGs) are estimated based on DFCs.
- ✓ MAGs are used as maximum groundwater supply for RWPG recommended strategies.
- ✓ GCDs have rule-making authority to meet DFCs.
- ✓ GCDs have authority to limit production and implement well spacing.
- ✓ GCDs have enforcement capabilities.
- ✓ GCDs are voting members on RWPGs.

TWC § 36.108(d) Nine Factor Consideration

Other Relevant Information

Other information relevant to DFCs consideration and adoption

Before adoption of DFCs, GCDs consider groundwater availability models and other data or information for the management area and consider nine factors including other information relevant to the specific desired future conditions (Texas Water Code § 36.108(d)(9)).

Other considerations

- ❖ GMA 9 does not identify any GCD-specific and/or local issues that may impact the Edwards Group of the Edwards-Trinity Plateau Aquifer DFC, the Ellenburger-San Saba Aquifer, and the Hickory Aquifer DFCs.
- ❖ Potential large-scale pumping in GMA 9 in the Trinity Aquifer.
- ❖ Drawdown in the Middle Trinity Aquifer in southwestern Travis County.

Other Considerations (continued)

- ❖ Differences in Trinity Aquifer hydrogeology
 - Aquifer does not function uniformly across extent of GMA 9.
 - Update to Hill Country Trinity GAM needs to include these differences to develop multiple, achievable DFCs.
- ❖ Targeted and specific exemptions that may affect Trinity MAG
 - TGRGCD enabling statute exempts some existing public water supply wells – normally non-exempt under Chapter 36.
 - HTGCD enabling statute exempts agricultural use wells – normally non-exempt under Chapter 36.
- ❖ Excessive growth in Travis, Hays, and Comal County causing an increased demand on groundwater in those high growth areas. Increased demand leads to lowering of local water levels in those counties, which causes a subsequent “cone of depression” and increase of groundwater flow from upgradient Blanco County, which then results in (1) a decline in Blanco County groundwater resources, and (2) a corresponding negative impact on groundwater and property rights of Blanco County well and property owners.

Proposed Non-Relevant Aquifers

Texas Administrative Code Chapter 356.31

- According to the TAC, a GMA may propose to classify an aquifer/portion of an aquifer as non-relevant.
- GCDs must submit the following:
 - A description, location, and or map of the aquifer;
 - A summary of aquifer characteristics, demands, current use including TERS that support conclusions that DFCs in adjacent or hydraulically connected hydraulically relevant aquifer(s) will not be affected;
 - An explanation of why the aquifer or portion of the aquifer is non-relevant for joint planning purposes.

Proposed Non-Relevant Aquifers



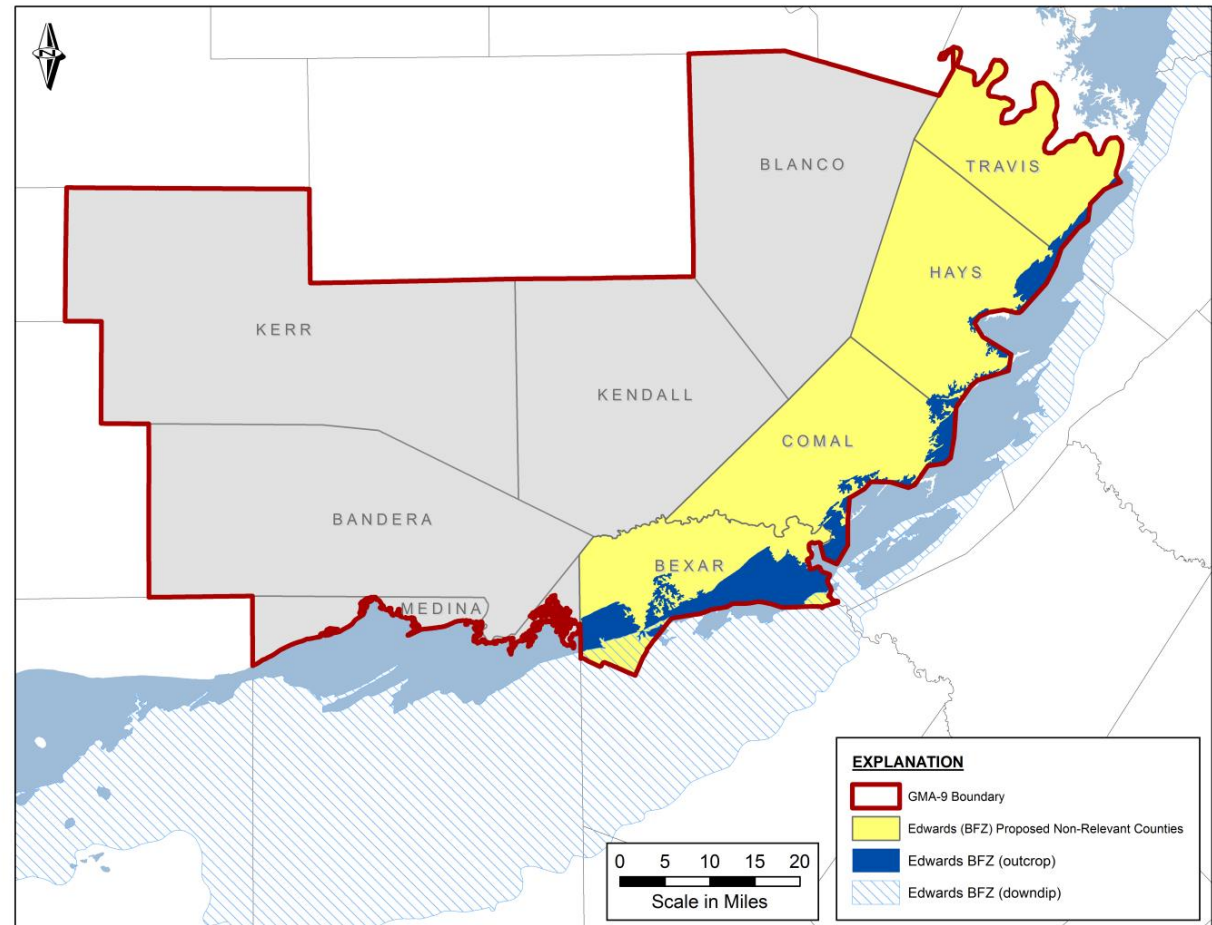
GMA 9 Proposed Non-Relevant Aquifer Classifications (Major and Minor Aquifers)

PROPOSED NON-RELEVANT AQUIFER CLASSIFICATION	Applicable Areas Within GMA 9 (All or portions of the following counties)
Edwards Aquifer (Balcones Fault Zone)	Bexar, Comal, Hays, and Travis counties
Edwards Group of Edwards-Trinity (Plateau)	Blanco and Kerr counties
Ellenburger-San Saba	Blanco and Kerr counties
Hickory	Blanco, Hays, Kerr, and Travis counties
Marble Falls	Blanco County

Proposed Non-Relevant Aquifers – Edwards Aquifer (BFZ): Bexar, Comal, Hays, and Travis Counties

Aquifer Characteristics:

- Limestone karst aquifer
- 200-600 feet thick
- Presence of sinkholes, sinking streams, caves, large springs, and highly productive water wells
- Responds quickly to rainfall, drought, and pumping



Proposed Non-Relevant Aquifers – Edwards Aquifer (BFZ): Bexar, Comal, Hays, and Travis Counties

Demands

- The City of San Antonio obtains the majority of its water supply from the aquifer.

Current Uses

- Non-exempt wells are used for municipal, industrial, or irrigation purposes.
- Exempt wells are used for livestock and domestic purposes.

Total Estimated Recoverable Storage Amounts within GMA 9

- The TERS volume estimates calculated by the TWDB (Jones and Bradley 2013) for the Edwards Aquifer (BFZ) have not been updated.

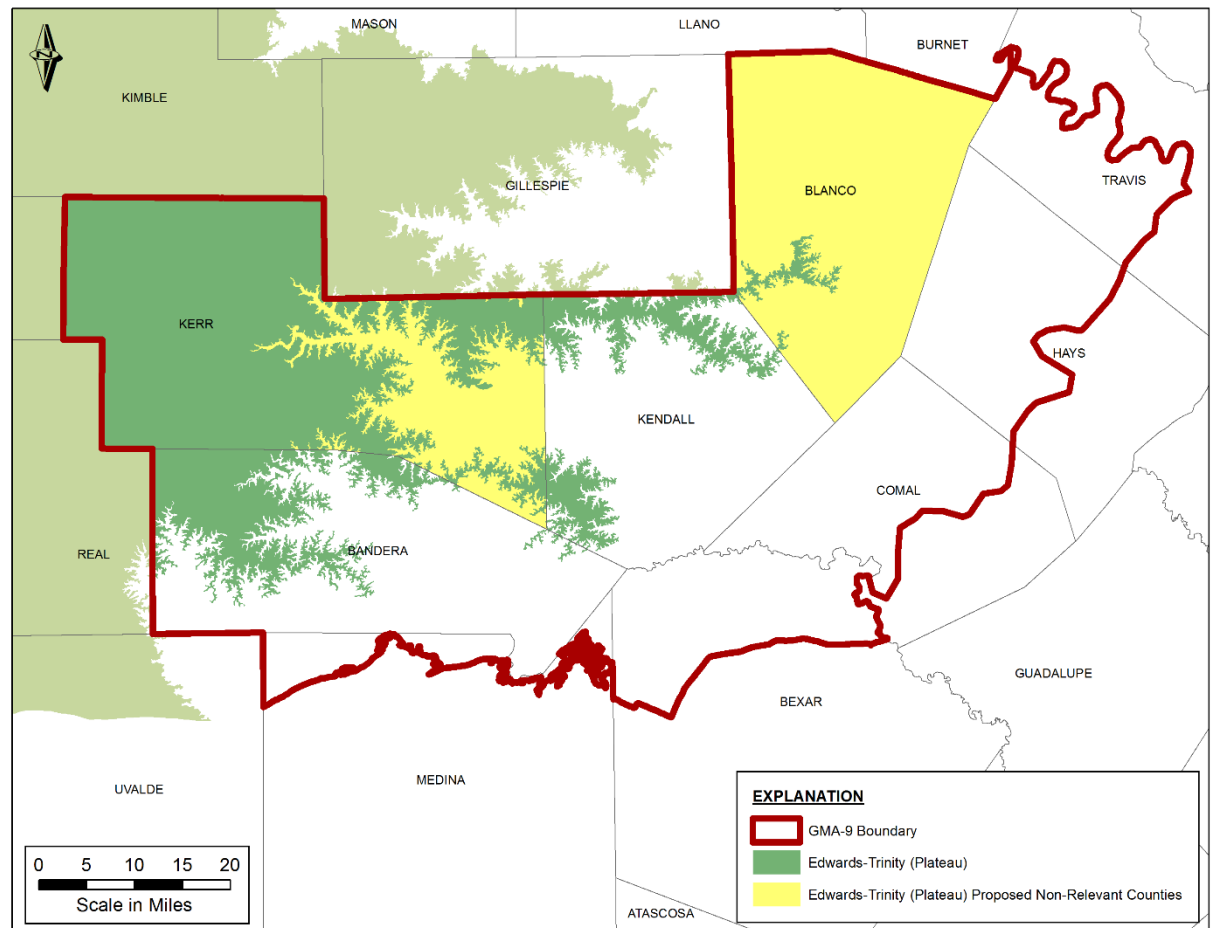
An explanation as to why the Edwards Aquifer (BFZ) is non-relevant

- The Edwards Aquifer is under the regulatory and management jurisdiction of the EAA and the BSEACD.
- Protective aquifer conditions and potential pumping amounts were set for the entirety of the Edwards Aquifer (BFZ) (San Antonio segment and EAA-regulated) and can only be amended through legislative actions.
- The EAA Act serves as the current DFCs and the de facto MAG amount.
- The portion of the Edwards Aquifer located in the BSEACD contains a very small amount of water. The BSEACD rules only allow exempt wells to be drilled in this portion of the Edwards Aquifer.

Proposed Non-Relevant Aquifers – Edwards Group of the Edwards-Trinity (Plateau) Aquifer: Blanco and Kerr Counties

Aquifer Characteristics:

- Thin layers of limestone and dolomite
- More porous than the Trinity Aquifer
- Yields are low



Proposed Non-Relevant Aquifers – Edwards Group of the Edwards-Trinity (Plateau) Aquifer: Blanco and Kerr Counties

Current Uses

Edwards Group of Edwards-Trinity (Plateau) Aquifer Estimated 2018 Groundwater Use (by GMA 9 County)

GMA 9 County	Type of Use and Estimated Use Amount for 2018 (in ac-ft)						
	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock	Totals
Bandera	49	0	0	0	0	66	115
Blanco	0	0	0	0	0	2	2
Hays	0	0	0	0	0	3	3
Kendall	44	0	0	0	0	19	63
Kerr	767	0	0	0	64	138	969
Totals	860	0	0	0	64	228	1,152

Source: TWDB Water Use Survey Team, Historical Groundwater Pumping Estimates

Proposed Non-Relevant Aquifers – Edwards Group of the Edwards-Trinity (Plateau) Aquifer: Blanco and Kerr Counties

Demands

- The small amount of water that is produced from this aquifer is generally used for domestic and livestock purposes.
- As of 2008, the BPGCD did not identify any non-exempt wells.

Total Estimated Recoverable Storage Amounts within GMA 9

- The TERS volume estimates calculated by the TWDB (Jones and Bradley 2013) for the Edwards Group of the Edwards-Trinity (Plateau) Aquifer have not been updated.

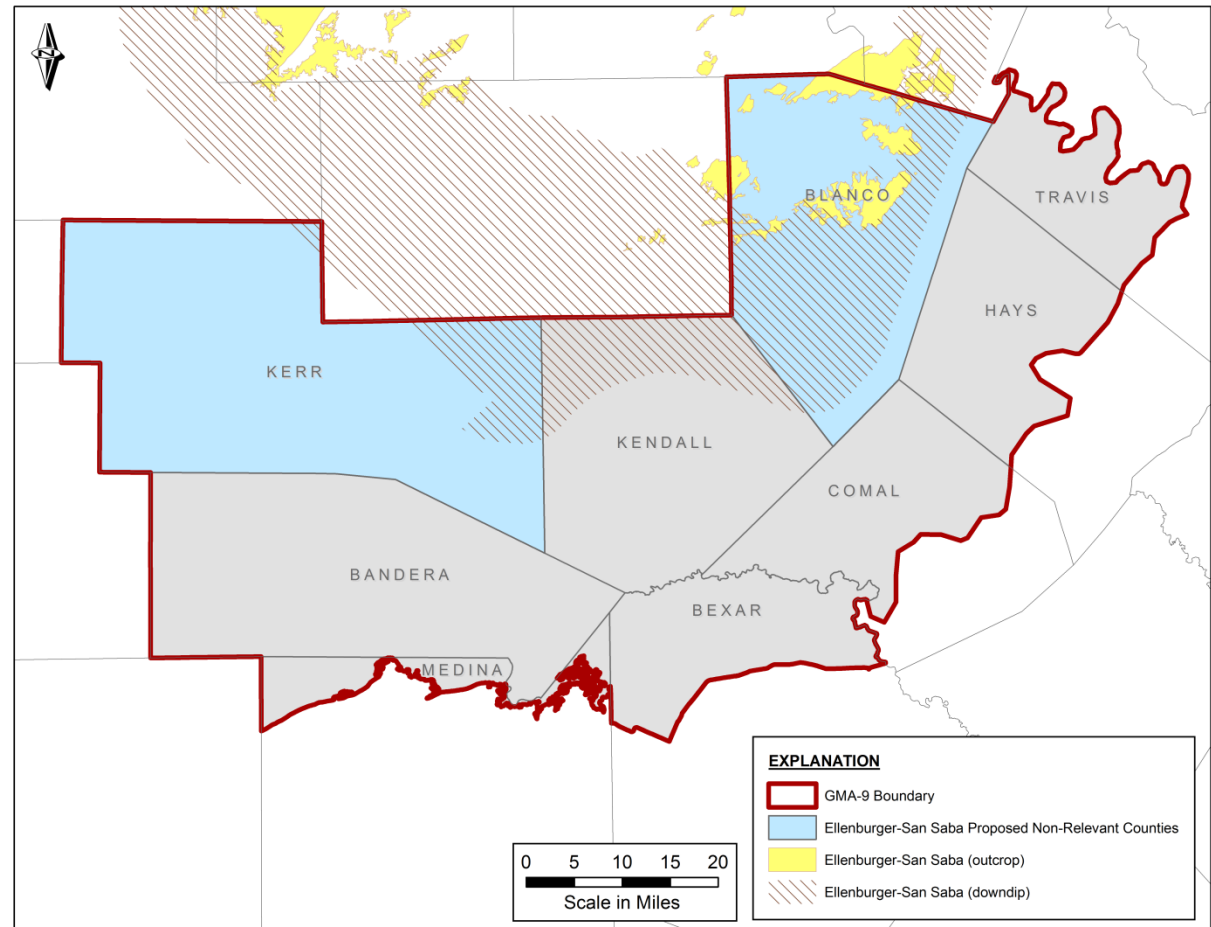
An explanation as to why the Edwards Group of the Edwards-Trinity (Plateau) is non-relevant

- Not a significant source of groundwater in Blanco and Kerr counties; pumping that occurs is likely for exempt uses in rural areas.
- Will not affect other users, proximal GCDs, or others jointly planning for the Edwards Group within GMA 9 or in other GMAs.
- For HGCD (Kerr County) , 1) the Edwards Group is considered <10% county groundwater use; 2) HGCD rules prohibit non-exempt well drilling in Edwards Group; 3) any pumping is exempt and primarily for domestic and livestock use.

Proposed Non-Relevant Aquifers – Ellenburger-San Saba Aquifer: Blanco and Kerr Countes

Aquifer Characteristics:

- Limestone and dolomite aquifer
- 0 to 1,000 feet range in thickness
- Average yield from all types of wells is about 65 gpm



Proposed Non-Relevant Aquifers – Ellenburger-San Saba Aquifer: Blanco and Kerr Counties

Ellenburger-San Saba Aquifer 2018 Groundwater Use (by GMA 9 County)

GMA 9 County	Type of Use and Estimated Use Amounts for 2018 (in ac-ft)						
	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock	Totals
Blanco	175	0	0	0	1,367	87	1,629
Totals	175	0	0	0	1,367	87	1,629

Source: TWDB Water Use Survey Team, Historical Groundwater Pumping Estimates

Total Estimated Recoverable Storage Amounts within GMA 9

- The TERS volume estimates calculated by the TWDB (Jones and Bradley 2013) for the Ellenburger-San Saba Aquifer have not been updated.

Proposed Non-Relevant Aquifers – Ellenburger-San Saba Aquifer: Blanco and Kerr Counties

Demands

- Municipal demands make up the largest proportion of groundwater use from the Ellenburger-San Saba, followed by irrigation and livestock.
- Johnson City uses water from the aquifer, and the City of San Saba uses water from San Saba Springs, which is believed to be derived from the Ellenburger-San Saba Aquifer.

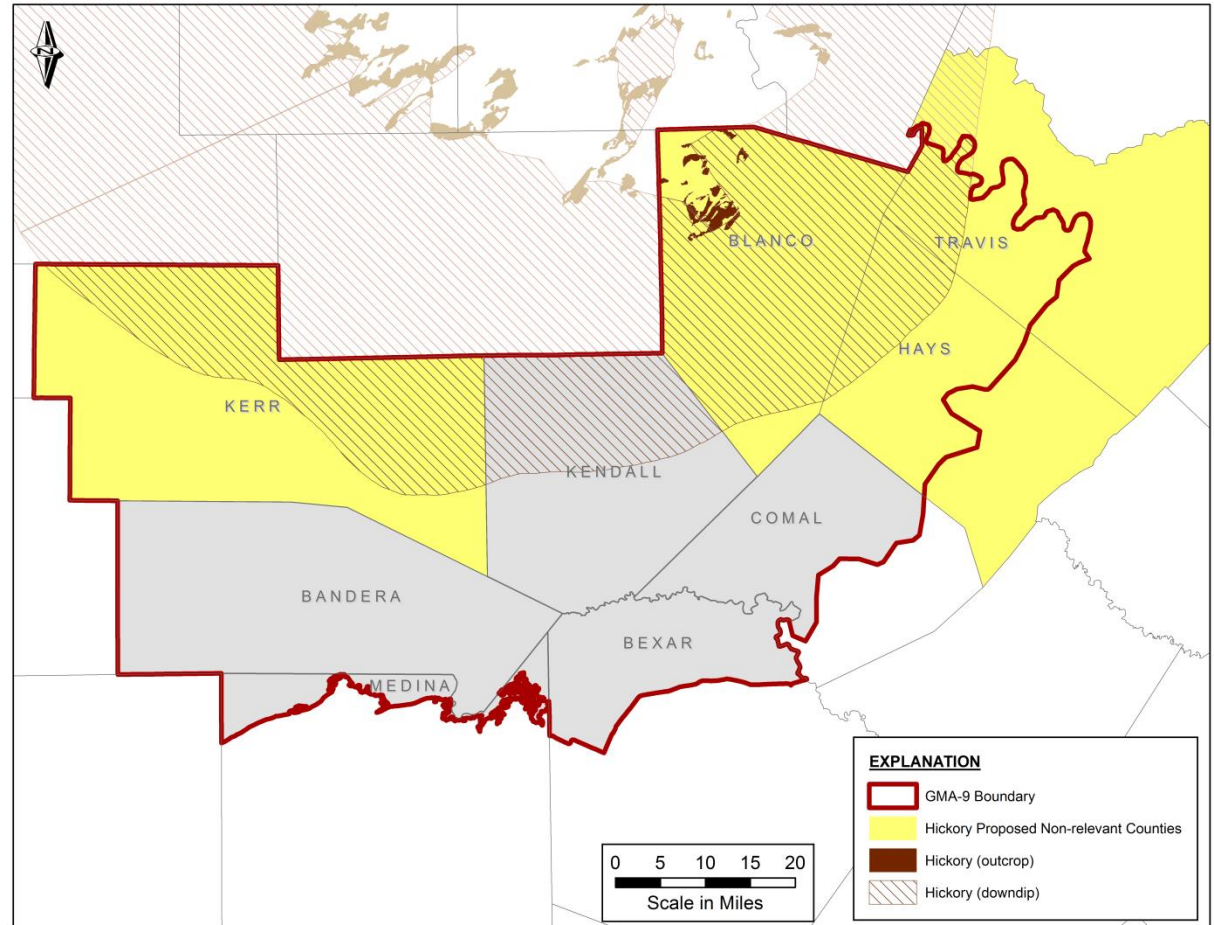
An explanation as to why the Ellenburger-San Saba is non-relevant

- There is limited production from the Ellenburger-San Saba in Kerr County.
- Largest permitted well system in Blanco County is owned by Johnson City and is already TCEQ and BPGCD regulated.
- Other than a few small-volume permitted wells in Blanco County, production is from exempt domestic and/or livestock watering wells.
- Geological and hydrogeological characteristics ensure that production from the Ellenburger-San Saba Aquifer does not affect other GCDs within GMA 9.
- Classifying the Ellenburger-San Saba Aquifer as non-relevant in Blanco and Kerr counties will have no significant impact on surrounding entities or the joint planning process.

Proposed Non-Relevant Aquifers – Hickory Aquifer: Blanco, Hays, Kerr, and Travis Counties

Aquifer Characteristics:

- Sandstone aquifer
- Production occurs in the outcrop area
- Highest yields typically found in the Llano uplift



Proposed Non-Relevant Aquifers – Hickory Aquifer: Blanco, Hays, Kerr, and Travis Counties

Current Uses

Hickory Aquifer 2018 Groundwater Use (by GMA 9 County)							
GMA 9 County	Type of Use and Estimated Use Amounts for 2018 (in ac-ft)						
				Steam Electric Power			
	Municipal	Manufacturing	Mining		Irrigation	Livestock	Totals
Blanco	53	0	0	0	273	33	359
Totals	53	0	0	0	273	33	359

Source: TWDB Water Use Survey Team, Historical Groundwater Pumping Estimates

Total Estimated Recoverable Storage Amounts within GMA 9

- The TERS volume estimates calculated by the TWDB (Jones and Bradley 2013) for the Hickory Aquifer have not been updated.

Proposed Non-Relevant Aquifers – Hickory Aquifer: Blanco, Hays, Kerr, and Travis Counties

Demands

- Irrigation makes up the largest proportion of groundwater use from the Hickory.
- The cities of Brady, Mason, and Fredericksburg (outside of GMA 9) use groundwater for municipal purposes.
- In western Hays county, groundwater is primarily for residential use and livestock use; there is little agriculture or commercial use. Rural demand is met by wells producing from the Lower Glen Rose and the Cow Creek formations.

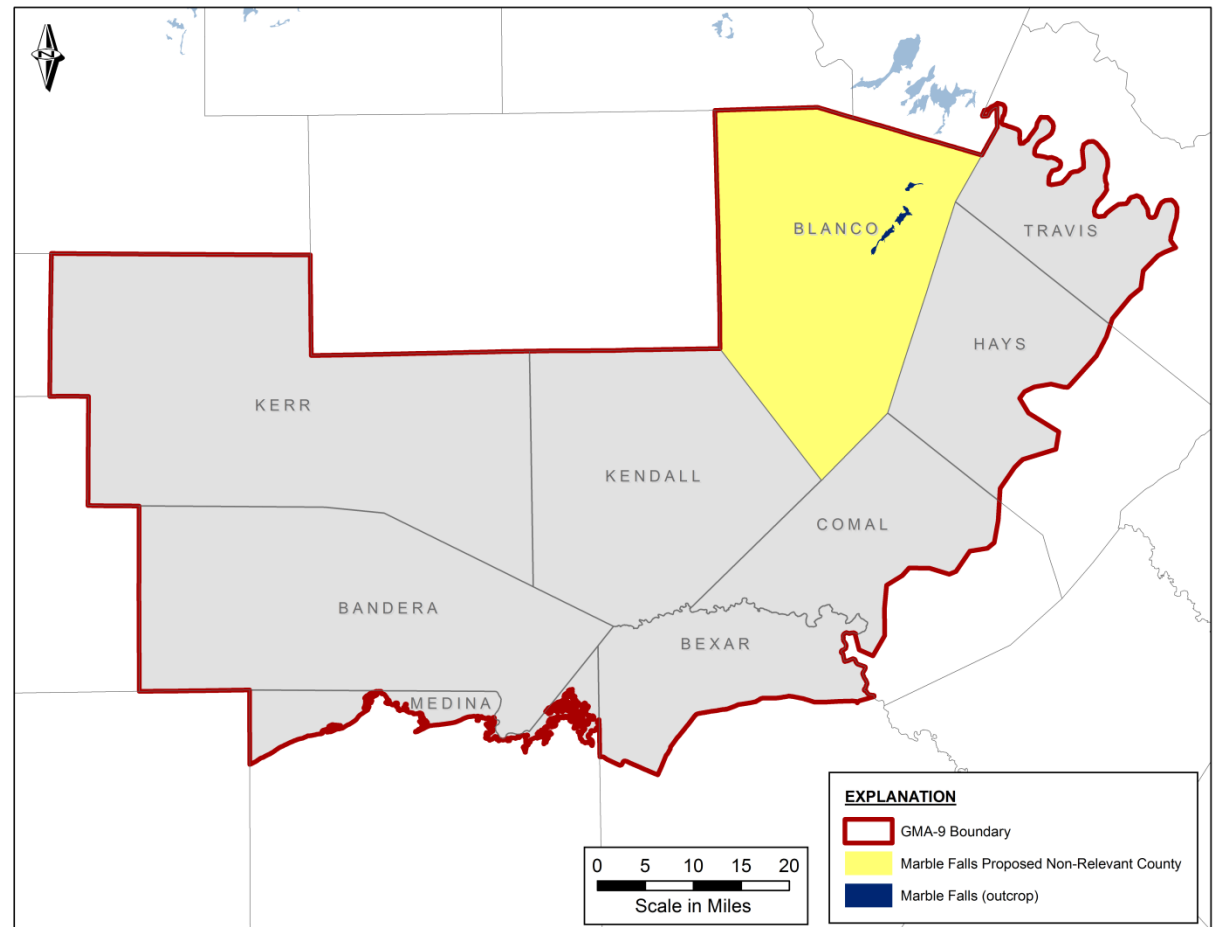
An explanation as to why the Hickory is non-relevant

- There is very limited use in Hays and Kerr counties, generally considered less economically viable or likely to be developed in these counties due to its significant depth.
- Only northwestern Blanco County has manageable quantities of Hickory groundwater production.
- Almost all Blanco County Hickory Aquifer wells are for exempt use.
- Hays County has no known Paleozoic rock water production and HTGCD did not include the Hickory Aquifer in planning.
- Given water quality uncertainty in portions of Blanco, Hays, Kerr, and Travis counties, non-relevant classification is not expected to impact this or other aquifers in this round of planning.

Proposed Non-Relevant Aquifers – Marble Falls Aquifer: Blanco County

Aquifer Characteristics:

- Finely-grained, thinly to thickly bedded limestone with imbedded shale
- Capable of producing small to moderate quantities of water
- Yield typically is less than 100 gpm



Proposed Non-Relevant Aquifers – Marble Falls Aquifer: Blanco County

Current Uses

Marble Falls Aquifer 2018 Groundwater Use (by GMA 9 County)

GMA 9 County	Type of Use and Estimated Use Amounts for 2018 (in ac-ft)						
	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock	Totals
Blanco	6	0	0	0	0	2	8
Totals	6	0	0	0	0	2	8

Source: TWDB Water Use Survey Team, Historical Groundwater Pumping Estimates

Total Estimated Recoverable Storage Amounts within GMA 9

- The TERS volume estimates calculated by the TWDB (Jones and Bradley 2013) for the Marble Falls Aquifer have not been updated.

Proposed Non-Relevant Aquifers – Marble Falls Aquifer: Blanco County

Demands

- Municipal, agricultural, and industrial use account for groundwater use from the Marble Falls Aquifer.
- The TWDB has seen no significant water level declines in wells.

An explanation as to why the Marble Falls is non-relevant

- Fewer than a dozen Marble Fall Aquifer well in Blanco County, and all are exempt.
- Small volume of Marble Falls production does not affect other GMA 9 GCDs.
- Classifying the Marble Falls as non-relevant in Blanco County, and all other counties in GMA 9, will have no significant impact on current water users, other GCDs, or the joint planning process.
- BPGCD has jurisdiction over the Marble Falls and will continue to manage the aquifer.

Proposed Desired Future Conditions

GMA 9 Proposed Desired Future Conditions (Major and Minor Aquifers)

<u>MAJOR OR MINOR AQUIFER</u>	<u>PROPOSED DESIRED FUTURE CONDITION*</u>
Trinity	Allow for an increase in average drawdown of approximately 30 feet through 2060 (throughout GMA 9) consistent with “Scenario 6” in TWDB GAM Task 10-005
Edwards Group of the Edwards-Trinity (Plateau)	Allow for no net increase in average drawdown in Bandera and Kendall counties through 2080
Ellenburger-San Saba	Allow for an increase in average drawdown of no more than 7 feet in Kendall County through 2080
Hickory	Allow for an increase in average drawdown of no more than 7 feet in Kendall County through 2080

* Allow for DFC variance of up to five percent when comparing DFCs to average drawdown calculations from model files.

Proposed Desired Future Conditions

Trinity and Edwards Group of Edwards-Trinity (Plateau) Aquifer DFC Statements – *Policy and Technical Justifications*

- ❖ For detailed discussion refer to GMA 9 2016 Explanatory Report.
- ❖ DFCs long-term targets (50-year time period).
- ❖ Severe drought, extreme wet conditions and average weather conditions have occurred since DFCs initially adopted. This data and information, along with the updated Hill Country Trinity GAM will be critical in assessing the DFCs in the next round of joint planning.
- ❖ Groundwater Availability Model Justifications
 - GAM Task 10-005 used to evaluate relationship between pumping versus drawdown, spring, and base flow and outflow in Trinity Aquifer
 - Committee selected Scenario 6 (about 92,000 acre-feet/year pumping) to balance competing water demands and determined DFC meets the "Balance Test"
 - 2010 – 2060: Trinity Aquifer: 93,052 – 90,503 acre-feet/year
 - MAG estimates extracted from previous GAM run 08-90 meets DFC for Edwards-Trinity Plateau Aquifer and allows for no net increase in average drawdown in Kendall and Bandera counties.
 - Committee selected DFC to balance MAG quantity to allow for some additional demand and reasonably protect spring flow and base flows to creeks and rivers.
 - 2010 – 2070: Edwards Group of Edwards-Trinity Plateau Aquifer: 2,208 acre-feet/year.

Proposed Desired Future Conditions

Trinity and Edwards Group of Edward-Trinity (Plateau) Aquifer DFC Statements – *Policy and Technical Justifications (continued)*

- ❖ 2016 – 2020: GCDs assessed water level changes and information on DFCs.
 - Data Assessment – “Groundwater Management Area 9: Proposed DFC Monitoring Methodology.” Fieseler and Hunt. November 2019 – Trinity Aquifer only
 - Hill Country Trinity GAM Update – by 2027
- ❖ Practical and cost-efficient methodology to review/refine new DFCs with sufficient/relevant data.
- ❖ GCDs Management Plans, as required, address these DFCs.

Proposed Desired Future Conditions

Ellenburger-San Saba and Hickory Aquifer DFC Statements – *Technical Justifications*

- ❖ For detailed discussion refer to GMA 9 2016 Explanatory Report.
- ❖ DFCs long-term targets (50-year time period).
- ❖ Data Assessment Justifications.
 - Initial years after DFC adoption; assess water level changes; gather and review other data and information such as comparing actual groundwater use to MAGs.
- ❖ Groundwater Availability Model Justifications.
 - Assess DFC over time, re-evaluate during next planning round, and consider new model runs.
 - DFCs set to manage potential groundwater production with conservation and preservation of these aquifers in Kendall County.
 - GAM Run 16-023 MAG: Modeled Available Groundwater for GMA 9 relevant minor aquifers (2010 – 2070):
 - Ellenburger-San Saba Aquifer: 75 acre-feet/year (Kendall County only),
 - Hickory Aquifer: 140 acre-feet/year (Kendall County only).

Proposed Desired Future Conditions

Aquifer Uses or
Conditions

December 14, 2020

Supply Needs
and Management
Strategies

December 14, 2020

Hydrological
Conditions

December 14, 2020

Environmental
Impacts

December 14, 2020

Subsidence
Impacts

December 14, 2020

Socioeconomic
Impacts

January 25, 2021

Private Property
Rights

January 25, 2021

DFC Feasibility

March 22, 2021

Other Relevant
Information

January 25 and March 22, 2021

Proposed Non-Relevant Aquifers



GMA 9 Proposed Non-Relevant Aquifer Classifications (Major and Minor Aquifers)	
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Hickory	Blanco, Hays, Kerr, and Travis counties
Marble Falls	Blanco County

Proposed Desired Future Conditions

GMA 9 Proposed Desired Future Conditions (Major and Minor Aquifers)

<u>MAJOR OR MINOR AQUIFER</u>	<u>PROPOSED DESIRED FUTURE CONDITION*</u>
Trinity	Allow for an increase in average drawdown of approximately 30 feet through 2060 (throughout GMA 9) consistent with “Scenario 6” in TWDB GAM Task 10-005
Edwards Group of the Edwards-Trinity (Plateau)	Allow for no net increase in average drawdown in Bandera and Kendall counties through 2080
Ellenburger-San Saba	Allow for an increase in average drawdown of no more than 7 Feet in Kendall County through 2080
Hickory	Allow for an increase in average drawdown of no more than 7 feet in Kendall County through 2080

* Allow for DFC variance of up to five percent when comparing DFCs to average drawdown calculations from model files.

GMA Action to Adopt Proposed DFCs (and Non-Relevant Aquifers)

Texas Water Code §§ 36.108 (d) and (d-2):

- DFCs proposed for adoption relevant aquifers within GMA after considering technical and other data, and the nine factors.
- DFCs must provide balance between highest practicable level of groundwater production, and conservation, preservation, protection, recharging, and prevention of waste of groundwater and control of subsidence in GMA.
- DCFs proposed under TWC §36.108 (d) must be approved by two-thirds vote of all GCD representatives for distribution to GCDs in GMA.

GMA 9 2022 DFC Joint Planning Cycle – Next Steps

GMA 9 Proposed Desired Future Conditions and Non-Relevant Aquifer Classifications 90-Day Public Comment/Public Hearing Process and Timeline March 22, 2021

Date	Description
April 1, 2021	Notices of Adopted Proposed Desired Future Conditions and Non-Relevant Aquifer Classifications Mailed to Ten GCDs.
April 1, 2021	90-Day Public Comment Period Begins.
April 1, 2021 – June 30, 2021	GCDs Hold Public Hearings Per Notice Requirements in Texas Water Code §§ 36.108 (d-2), 36.063, and 36.101 (d).
June 30, 2021	90-Day Public Comment Period Ends.
August 2021	GCDs Prepare Public Comment Summary Reports.
September 2021	GMA 9 Meets to Consider GCD Public Comment Summary Reports.
October 2021	Consultant Incorporates Public Comment Summary Reports into ER and Finalizes Draft Report.

GMA 9 2022 DFC Joint Planning Cycle – Next Steps

For 90-Day Public Comment Period:

- Letter to GCDs with formal notification of March 22, 2021 action to adopt proposed DFCs and non-relevant aquifer classifications.
- Public comment form.
- Sample GCD public hearing information for agenda meeting notice.
- Consultant to provide Sharefile link to documents for 90-day public comment period.