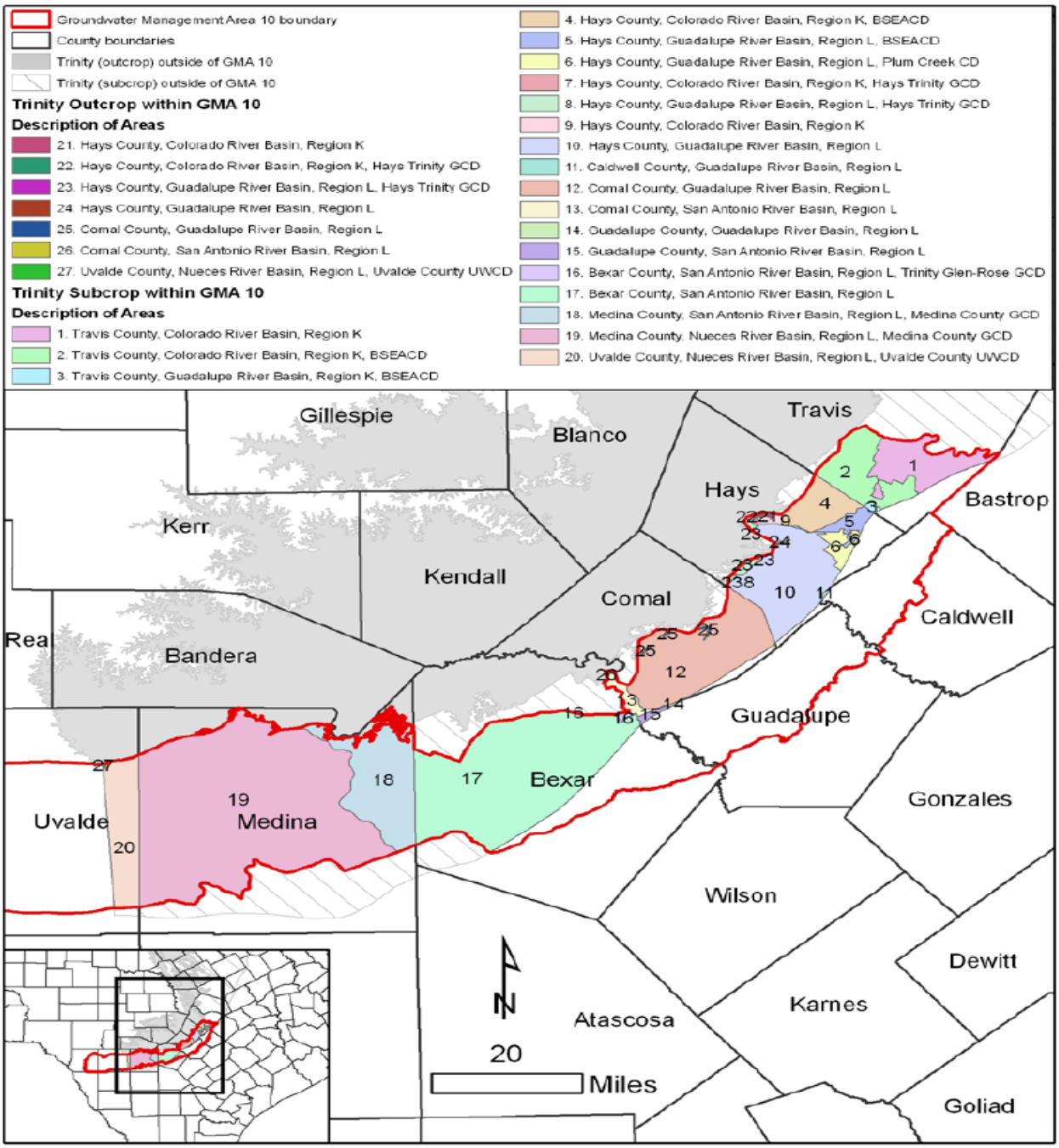
Proposal for designating the Trinity in GMA 10 as non-relevant for Bexar County:

GMA 10 members are proposing to classify the Trinity as non-relevant for the purposes of joint planning in Bexar County. This area of the Trinity is located within GMA 10, Bexar County as designated under Number 17 (Teal) on map 1.

Map 1. Location of Trinity within GMA 10.



Requirements for proposing a non- relevant aquifer:

According to Texas Administrative Code 356.31(b) "The districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion 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. In such a case no desired future condition is required. The districts must submit the following documentation to the agency related to 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** as provided by the executive administrator, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and

(3) An explanation of **why** the aquifer or portion of the aquifer is non-relevant for joint planning purposes."

Aquifer Portion Description, Location and Map:

The following section describes the Trinity aquifer, as taken from the "*Explanatory Report for Proposed Desired Future Conditions of the Trinity Aquifer in Groundwater Management Area 10"* that was submitted in conjunction with the adopted DFCs(6/26/2017):

"The Trinity Aquifer consists of Cretaceous-age formations of varying viability as water sources. The upper Trinity Aquifer (comprising the upper Glen Rose Limestone) has low yields and poor water quality due to its evaporite beds. The middle Trinity Aquifer (comprising the lower Glen Rose Limestone, the Hensel Sand, and Cow Creek Limestone) is the most widely used portion of the aquifer. The lower Trinity Aquifer (comprising the Hosston Sand and Sligo Limestone) is as widely used due to its depth and water quality (SCTRWPG, 2010). The Trinity Aquifer outcrops very little within GMA 10 and exists as a confined aquifer underlying the Edwards (Balcones Fault Zone) Aquifer. It is currently used as a minor source of groundwater in Uvalde, Medina, Bexar, Comal, Guadalupe, Hays, and Travis counties, but is increasingly becoming a major source due to rapid development and increased water demands."

Aquifer Characteristics, Groundwater Demands, Current Groundwater Uses, Including Total Estimated Recoverable Storage (TERS):

The following describes the aquifer characteristics: recharge, lateral inflow, and the storage coefficient as described in *GAM RUN 16-033 MAG: MODELED AVAILABLE GROUNDWATER AQUIFERS IN GROUNDWATER MANAGEMENT AREA 10-July 20, 2018*

"*Recharge* *is assigned only to the outcrop areas. The average annual precipitation for outcrop map areas was determined from the Texas Climatic Atlas (Narasimhan and others, 2008), which is the average for years 1971 to 2000; the*

values range from 29 to 36 inches per year. The effective recharge rate is estimated to be 4 percent. The effective recharge calculation is the map area, in acres, multiplied by the estimated average annual precipitation, in feet, and the effective recharge rate, in percent."

*"**Lateral inflow** to the Trinity Aquifer in Groundwater Management Area 10 is estimated to be 46,018 acre-feet per year based on the average outflow across the Balcones Fault Zone results (Scenario 6) from GAM Task 10-005 (Hutchison, 2010). This volume was apportioned across each county by aquifer map areas. GAM Task 10-005 does not include inflows to Uvalde County, so a proportional amount based on inflow to Medina County was used to estimate the inflow to Uvalde County."*

*"**The storage coefficient** for the Trinity Aquifer subcrop is assumed to be 1 X 10^{-5} derived from aquifer tests of the Trinity Aquifer subcrop in Travis and Hays counties (Hunt and others, 2010). The storage coefficient for the Trinity Aquifer subcrop in the remaining counties is assumed to be 5 X 10^{-5} as derived from the calibrated groundwater availability model for the Hill Country portion of the Trinity Aquifer system in Texas (Jones and others, 2009). The average specific yield of the Trinity Aquifer outcrop is estimated to be 5 X 10^{-2} (Ashworth, 1983)."*

Groundwater Demands:

Table 1 contains the 2022 State Water Plan Information for the county of Bexar in GMA 10 containing the Trinity Aquifer. All values are in acre-ft/yr. Note that the Bexar County totals are not limited to the portion of each county in GMA 10.

Table 1. Bexar County Demand, Existing Supplies, Needs, and Strategy Supplies. Note: This table may include areas outside of GMA 10.

County		2020	2030	2040	2050	2060	2070
Bexar	Demands	344,053	370,868	395,122	420,879	446,877	471,297
	Existing Supplies	350,128	352,726	356,461	360,814	364,601	366,478
	Needs	12,387	27,016	47,872	68,266	90,218	112,499
	Strategy Supplies	47,631	186,674	265,999	294,951	371,856	404,066

Trinity Groundwater Use in Proposed Non-Relevant Area:

Currently there is known Trinity production within the proposed designated "non-relevant" Trinity area. However, there is no GCD to manage or monitor water use to maintain a DFC.

Trinity Groundwater use for Bexar County:

The total groundwater pumpage values by county from the Trinity Aquifer in acre-ft/yr are shown in the table 2 below. Note that the pumping estimates may include areas of the Trinity Aquifer outside of GMA 10. These values were derived from this website https://www.twdb.texas.gov/waterplanning/waterusesurvey/historical-pumpage.asp

Table 2. Groundwater Pumpage values. Includes areas outside of GMA 10.

County	Bexar
2000	7,964
2001	18,289
2002	177,663
2003	10,735
2004	27,898
2005	16,791
2006	26,420
2007	2,232
2008	180,448
2009	462,352
2010	30,830
2011	11,710
2012	13,005
2013	193,643
2014	10,651
2015	29,908
2016	18,096
2017	21,302
2018	192,112
2019	12,615

Total Estimated Recoverable Storage:

The Total Estimated Recoverable Storage (TERS) is defined as a porosity-adjusted volume of groundwater that might be recovered from the aquifer assuming 25 percent or 75 percent recovery. The numbers should be considered as a very simplistic approach to estimating an upper limit volume of available groundwater on a volumetric basis only. The TERS numbers are based on porosity-adjusted volumetric calculations of projected geologic formations without detailed local subsurface data. The TERS is an estimate of total "water-in-place," but there are many other factors that must be considered in assessing groundwater availability and DFCs. The TERS for the proposed Non-Relevant Trinity aquifer is shown in tables 3 & 4 below.

Table 3. TOTAL ESTIMATED RECOVERABLE STORAGE BY GROUNDWATER CONSERVATION DISTRICT FOR THE TRINITY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 10. GROUNDWATER CONSERVATION DISTRICT TOTAL ESTIMATES ARE ROUNDED WITHIN ONE PERCENT OF THE TOTAL

Groundwater Conservation District	*Total Storage (acre-feet)*	*25 percent of Total Storage (acre-feet)*	*75 percent of Total Storage (acre-feet)*
No District	9,400,000	2,350,000	7,050,000

Table 4. TOTAL ESTIMATED RECOVERABLE STORAGE BY COUNTY FOR THE TRINITY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 10. GROUNDWATER CONSERVATION DISTRICT TOTAL ESTIMATES ARE ROUNDED WITHIN ONE PERCENT OF THE TOTAL

County	*Total Storage (acre-feet)*	*25 percent of Total Storage (acre-feet)*	*75 percent of Total Storage (acre-feet)*
Bexar	5,500,000	1,375,000	4,125,000

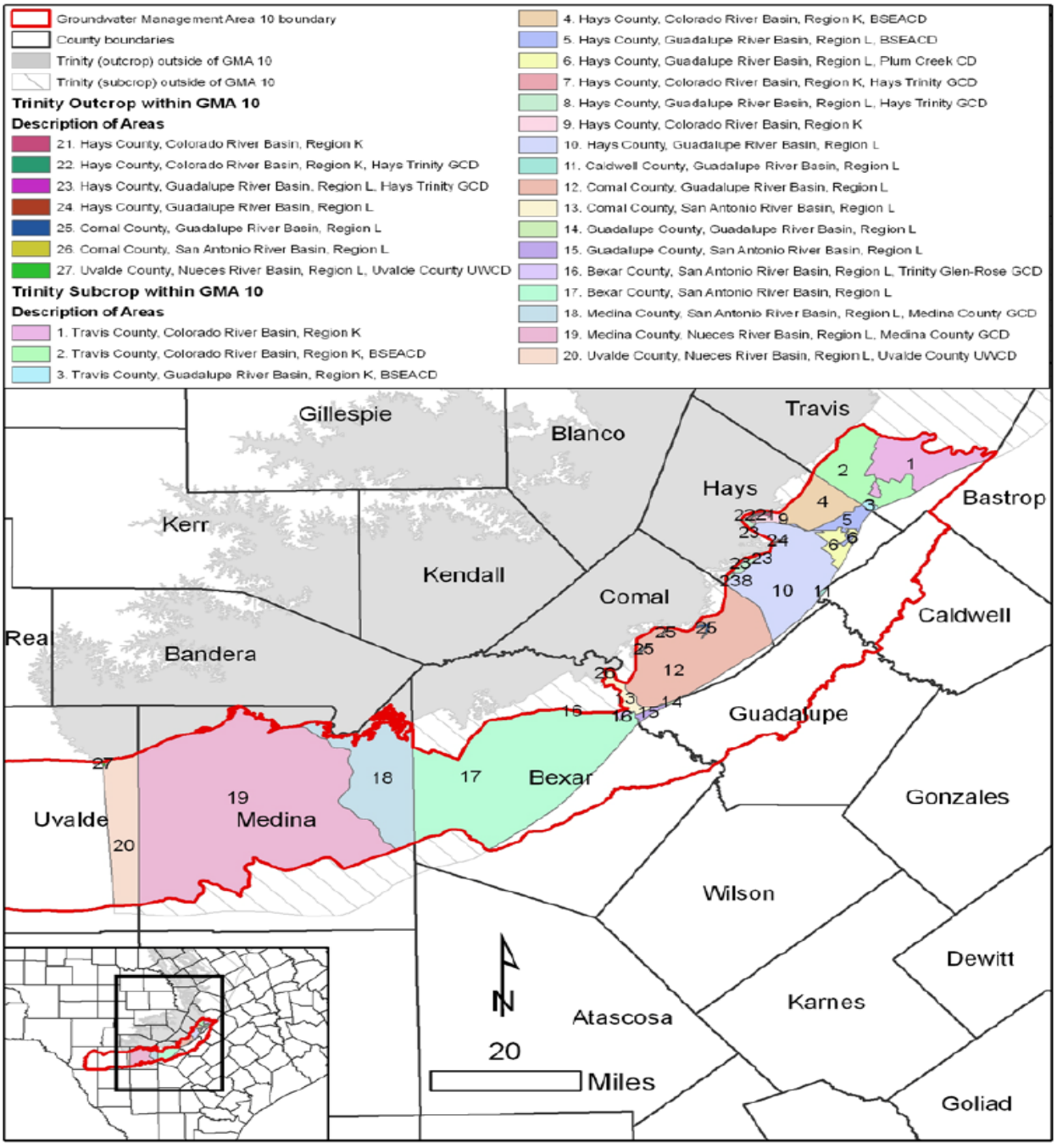
Rationale for proposing the Trinity as Non-relevant in Bexar County:
The following is an explanation of why GMA 10 is proposing to classify the Trinity as non-relevant for the purposes of joint planning in the portion of Bexar within GMA 10:

- The designation of the portions of the Trinity as non-relevant within Bexar County will have no effect on joint planning efforts for this resource.
- This proposed classification does not impact any GCDs authority to manage the Trinity Aquifer throughout the rest of GMA 10. Nor does it impact other districts outside of GMA 10 as this aquifer remains within those GCDs' jurisdictional boundaries and continues to be subject to their enabling statutes, rules, management plans, and programs.
- Currently there is known Trinity production within the proposed designated "non-relevant" Trinity area. However, there is no GCD to manage or monitor water use to maintain a DFC.
- There are no issued Trinity production permits within the proposed non-relevant area.
- The modeled available groundwater for this area is only 999 acre-feet as stated by GR 16-033 MAG.
- The language contained in water code Chapter 36.108(d-2) states ".. The desired future condition …. must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, recharging, and prevention of waste of groundwater". Because there isn't any known monitoring of Trinity aquifer use, nor any issued permits, nor a groundwater conservation district in this area, this balancing requirement by default has been satisfied.

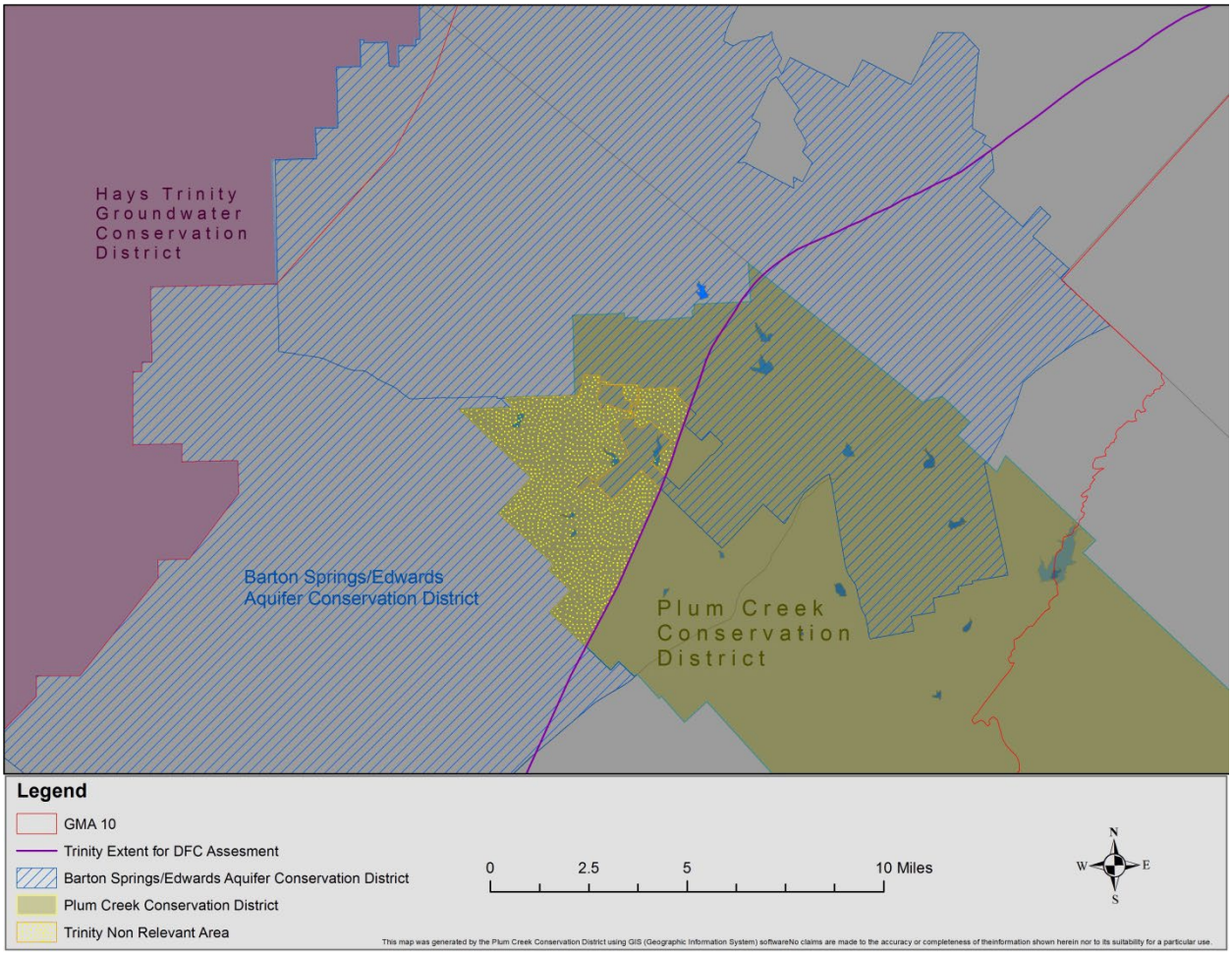
In summary, GMA 10 determined that the aquifer characteristics, groundwater demands, and current groundwater uses for that portion of the Trinity located in Bexar County do not warrant adopting a DFC. Therefore, GMA 10 is proposing that this aquifer located within the boundaries of Bexar County, specifically, be classified as non-relevant for joint planning purposes.

Proposal of designating portions of the Trinity in GMA 10 as non-relevant:

GMA 10 members are proposing to classify certain areas of the Trinity as non-relevant for the purposes of joint planning. These areas of the Trinity are located within GMA 10, Hays County and Plum Creek Conservation District as those areas designated under Number 6 (Yellow) on map 1. Additionally these areas are shown on map 2. This area is approximately 11,042 acres.



MAP 1



MAP 2

Requirements for proposing a non- relevant aquifer:

According to Texas Administrative Code 356.31(b) " The districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion 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. In such a case no desired future condition is required. The districts must submit the following documentation to the agency related to 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** as provided by the executive administrator, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and

(3) An explanation of **why** the aquifer or portion of the aquifer is non-relevant for joint planning purposes."

Aquifer Portion Description, Location and Map:

The following section describes the Trinity aquifer, as taken from the "*Explanatory Report for Proposed Desired Future Conditions of the Trinity Aquifer in Groundwater Management Area 10*" that was submitted in conjunction with the adopted DFCs(6/26/2017):

"The Trinity Aquifer consists of Cretaceous-age formations of varying viability as water sources. The upper Trinity Aquifer (comprising the upper Glen Rose Limestone) has low yields and poor water quality due to its evaporite beds. The middle Trinity Aquifer (comprising the lower Glen Rose Limestone, the Hensel Sand, and Cow Creek Limestone) is the most widely used portion of the aquifer. The lower Trinity Aquifer (comprising the Hosston Sand and Sligo Limestone) is as widely used due to its depth and water quality (SCTRWPG, 2010). The Trinity Aquifer outcrops very little within GMA 10 and exists as a confined aquifer underlying the Edwards (Balcones Fault Zone) Aquifer. It is currently used as a minor source of groundwater in Uvalde, Medina, Bexar, Comal, Guadalupe, Hays, and Travis counties, but is increasingly becoming a major source due to rapid development and increased water demands."

Aquifer Characteristics, Groundwater Demands, Current Groundwater Uses, Including Total Estimated Recoverable Storage (TERS):

The following describes the aquifer characteristics: recharge, lateral inflow, and the storage coefficient as described in *GAM RUN 16-033 MAG: MODELED AVAILABLE GROUNDWATER AQUIFERS IN GROUNDWATER MANAGEMENT AREA 10-July 20, 2018*

***"Recharge** is assigned only to the outcrop areas. The average annual precipitation for outcrop map areas was determined from the Texas Climatic Atlas (Narasimhan and others, 2008), which is the average for years 1971 to 2000; the values range from 29 to 36 inches per year. The effective recharge rate is estimated to be 4 percent. The effective recharge calculation is the map area, in acres, multiplied by the estimated average annual precipitation, in feet, and the effective recharge rate, in percent."*

***"Lateral inflow** to the Trinity Aquifer in Groundwater Management Area 10 is estimated to be 46,018 acre-feet per year based on the average outflow across the Balcones Fault Zone results (Scenario 6) from GAM Task 10-005 (Hutchison, 2010). This volume was apportioned across each county by aquifer map areas. GAM Task 10-005 does not include inflows to Uvalde County, so a proportional amount based on inflow to Medina County was used to estimate the inflow to Uvalde County."*

*"**The storage coefficient** for the Trinity Aquifer subcrop is assumed to be 1 X 10^{-5} derived from aquifer tests of the Trinity Aquifer subcrop in Travis and Hays counties (Hunt and others, 2010). The storage coefficient for the Trinity Aquifer subcrop in the remaining counties is assumed to be 5 X 10^{-5} as derived from the calibrated groundwater availability model for the Hill Country portion of the Trinity Aquifer system in Texas (Jones and others, 2009). The average specific yield of the Trinity Aquifer outcrop is estimated to be 5 X 10^{-2} (Ashworth, 1983)."*

Groundwater Demands:

The 2022 State Water Plan Information for the county of Hays in GMA 10 containing the Trinity Aquifer. All values are in acre-ft/yr. Note that the Hays county totals are not limited to the portion of each county in GMA 10.

County		2020	2030	2040	2050	2060	2070
HAYS	Demands	40,729	50,453	61,476	72,555	89,124	107,760
	Existing Supplies	54,630	54,727	56,157	57,587	61,082	62,497
	Needs	626	4,079	10,390	18,751	31,337	48,349
	Strategy Supplies	19,698	35,543	55,564	65,714	78,368	90,058

Trinity Groundwater Use in Proposed Non-Relevant Area:

Currently there is no known Trinity production within the proposed designated "non-relevant" Trinity areas.

Trinity Groundwater use for Hays County:

The total groundwater pumpage values by county from the Trinity Aquifer in acre-ft/yr are shown in the table below. Note that the pumping estimates may include areas of the Trinity Aquifer outside of GMA 10. These values were derived from this website https://www.twdb.texas.gov/waterplanning/waterusesurvey/historical-pumpage.asp

County	Hays
2000	2,236
2001	2,441
2002	2,212
2003	2,115
2004	2,024
2005	2,249

2006	3,497
2007	3,818
2008	3,670
2009	4,262
2010	4,985
2011	6,110
2012	5,286
2013	5,061
2014	3,287
2015	2,791
2016	2,866
2017	3,007
2018	2,906
2019	2,993

Total actual groundwater pumpage values for the TrinityAquifer in Travis and Hays County within BSEACD (acre-ft/yr). Values from BSEACD.

Aquifer	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Trinity	10.7	27.9	17.8	19.7	49.1	165.9	149.2	185.4	160.6	405.7	651.5	671.6	614.7

Total Estimated Recoverable Storage:

The Total Estimated Recoverable Storage (TERS) is defined as a porosity-adjusted volume of groundwater that might be recovered from the aquifer assuming 25 percent or 75 percent recovery. The numbers should be considered as a very simplistic approach to estimating an upper limit volume of available groundwater on a volumetric basis only. The TERS numbers are based on porosity-adjusted volumetric calculations of projected geologic formations without detailed local subsurface data. The TERS is an estimate of total "water-in-place," but there are many other factors that must be considered in assessing groundwater availability and DFCs. The TERS for the proposed Non-Relevant Trinity aquifer is shown in the table below under Plum Creek Conservation District.

GAM task 13-033 Total Estimated Recoverable Storage August 20, 2013
TOTAL ESTIMATED RECOVERABLE STORAGE BY GROUNDWATER CONSERVATION DISTRICT[3] FOR THE TRINITY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 10. GROUNDWATER CONSERVATION DISTRICT TOTAL ESTIMATES ARE ROUNDED WITHIN ONE PERCENT OF THE TOTAL

Groundwater Conservation District	*Total Storage (acre-feet)*	*25 percent of Total Storage (acre-feet)*	*75 percent of Total Storage (acre-feet)*
Plum Creek CD	270,000	67,500	202,500
Barton Springs-Edwards Aquifer Conservation District	1,200,000	300,000	900,000

Rationale for proposing the Trinity as Non-relevant:
The following is an explanation of why GMA 10 is proposing to classify the Trinity as non-relevant for the purposes of joint planning in those portions of Hays County and Plum Creek Conservation District within GMA 10:

- The designation of the portions of the Trinity as non-relevant within Plum Creek Conservation District will have no effect on joint planning efforts for this resource.
- This proposed classification does not impact either the PCCD's authority or the BSEACD's ability to manage that portion of the Trinity Aquifer located in portions of Hays and Travis counties. Nor does it impact other districts within GMA 10 as this aquifer remains within these GCDs' jurisdictional boundaries and continues to be subject to their enabling statutes, rules, management plans, and programs.
- The amount of pumping in the Trinity Aquifer occurring within GMA 10 is under the management of GCD within GMA 10. The proposed designation for these portions of the Trinity as non-relevant will have no effect on users located in other Districts within GMA 10.
- There is not any known Trinity aquifer pumping/use within the proposed non-relevant area.
- There is not any issued Trinity production permits within the proposed non-relevant area.
- There is not any pending or recently anticipated water use for areas within the proposed non-relevant area.
- The Trinity modeled available groundwater (GAM Run 16-033) issued in July 20, 2018 for this area is only 238 acre ft. As a note the Trinity in this area during the last DFC planning cycle was considered relevant.
- The language contained in water code Chapter 36.108(d-2) states ".. The desired future condition …. must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, recharging, and prevention of waste of groundwater". Because there isn't any know Trinity aquifer use, nor any

issued permits, nor any anticipated development within the proposed non-relevant area, this balancing requirement by default has been satisfied.

In summary, GMA 10 determined that the aquifer characteristics, groundwater demands, and current groundwater uses for that portion of the Trinity located in Plum Creek Conservation District do not warrant adopting a DFC. Therefore, GMA 10 is proposing that this aquifer located within the boundaries of Plum Creek Conservation District, specifically, be classified as non-relevant for joint planning purposes.