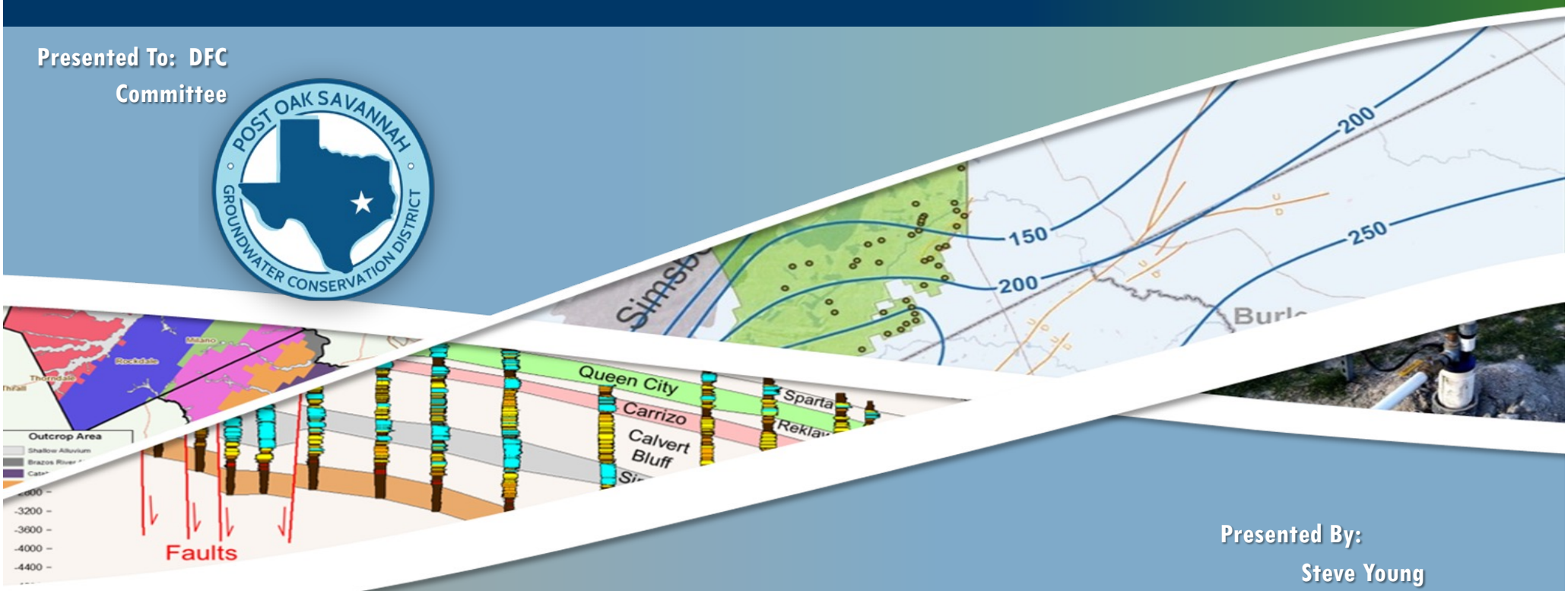
Discussion Regarding GMA 12 Process for Appropriate Consideration of Nine Factors from Section 36.108, TWC During the Development of DFCs

Presented To: DFC Committee



Presented By:

Steve Young

October 10, 2023

Discussion Topics

- Joint Planning Process 3rd and 4th Cycles
- GMA 12 Revised Approach to Considering Nine Factors in the DFC Process
- Three Factors to be Discuss in the October 26 GMA 12 meeting
  - Aquifer Uses and Conditions
  - Hydrogeological Conditions
  - Water Supply Needs and Water Management Strategies

Joint Planning Process:

- Before voting on the proposed desired future conditions … the districts shall consider per TWC §36.108 (d)
    - Aquifer uses and conditions
    - Needs and strategies
    - Hydrologic conditions
    - Environmental impacts
    - Subsidence
    - Socioeconomic impacts
    - Private property rights
    - Feasibility
    - Anything else

- GMA 12 needs to approve DFCs not later than January 5, 2027 (HB 3278)

Joint Planning Process (con't)

- Per TWC §36.108 (d-2):

  The desired future conditions … must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater … in the management area.

Approach to Address TWC Requirements

- Last Joint Planning Session
  - Nine factors listed in TWC §36.108 (d) were discussed in general terms prior to the adoption of DFCs
    - No local socioeconomic impacts analysis despite POSGCD expressed concerns over production in Carrizo
    - Stakeholders raised concerns about sustainability and groundwater-surface water impacts
    - Several districts appear to have the position that DFC runs need to account for permits with "known" pumping
  - The balance requirement in TWC §36.108 (d-2) was not discussed until after the DFCs were proposed
    - POSGCD argued that Carrizo production should be reduce to meet balance requirement prior to adoption of DFCs
    - Criteria for evaluating balance requirement or defining highest practicable pumping not directly addressed

- Current Joint Planning Session
  - Using current DFCs, revisit the GMA 12's considerations for the nine factors
  - Using current DFCs, revisit GMA 12's evaluation of the balance requirement

Three Factors To Be Discuss in GMA 12 Meeting October 26

- **aquifer uses** or conditions within the management area, including conditions that differ substantially from one geographic area to another

- **hydrological conditions**, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge

- the **water supply needs** and water management strategies included in the state water plan

Aquifer Uses or Conditions (3rd Joint Planning Cycle)

- Aquifers
- Water Use Types
- 2018 Production by GCD by Aquifer
- Percentage of GCD Aquifer Production by Water Use Type
- Carrizo-Wilcox Aquifer not separated into aquifers for production

Aquifer Uses or Conditions (3rd Joint Planning Cycle)

Example: Queen City Information

Queen City Uses

- Groundwater primarily produced from shallow to moderately deep wells (most <100 a few up to 2,000')
- Groundwater primarily used for irrigation, domestic, and livestock
- Some used for municipal
- Some significant users:
  - Rural WSCs in METGCD
  - Town of Lincoln,
  - Landowners for livestock and domestic purposes

2018 Queen City Uses

Approximate Queen City 2018 Groundwater Use (Percent)

	LPGCD	POSGCD*	BVGCD	METGCD	FCGCD
Irrigation	60%	0%	5%	0%	5%
Livestock	15%	14%	<5%	5%	5%
Manufacturing	0%	0%	0%	10%	0%
Mining	0%	0%	40+%	0%	0%
Muncipal	25%	86%	50+%	85%	90%
Steam-Electric Power	0%	0%	0%	0%	0%

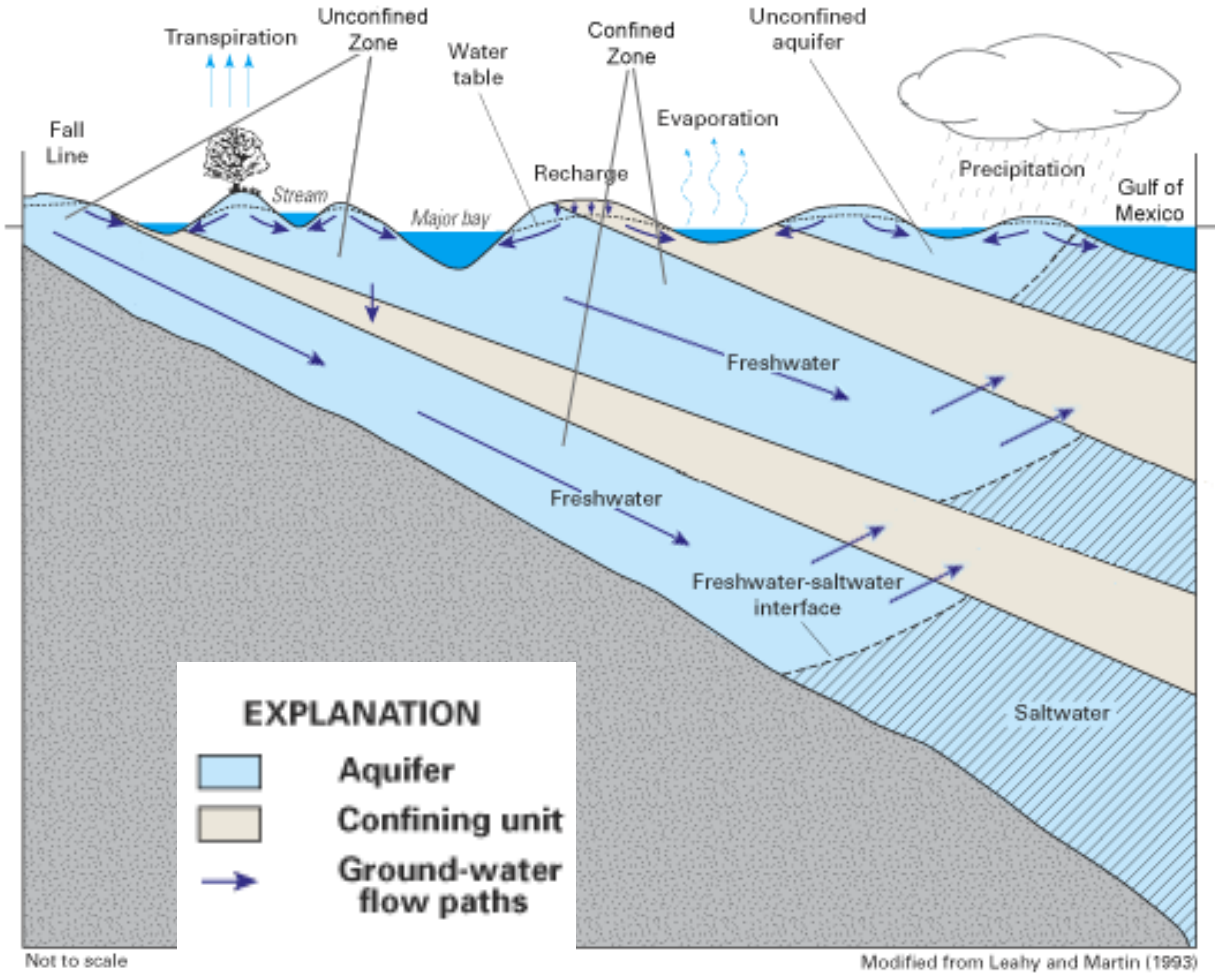
Aquifer Uses or Conditions (4th Joint Planning Cycle)

- Options for Expanded Descriptions
  - Standardize List of Water Uses
    - TWDB
    - GCDs
  - Water Uses (Production Amounts and Locations)
    - Exempt wells
    - Permitted Wells
    - Permitted Well Locations

- Options for Expanded Considerations
  - Impact of DFC on wells by water use types (over time)
  - Average decrease saturated thickness in outcrop/unconfined
  - Average decrease in available drawdown in confined area

Hydrological Conditions (3rd Joint Planning Cycle)

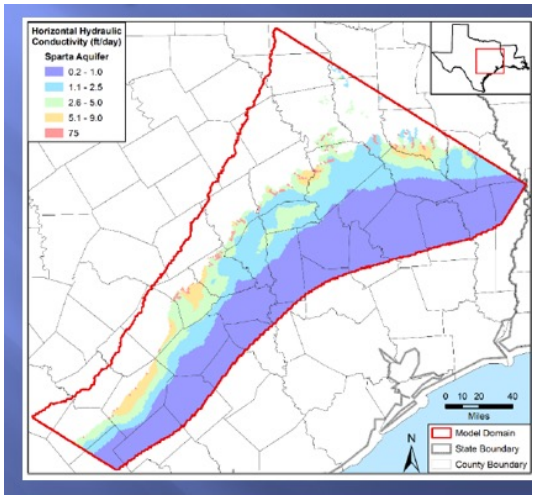
- Aquifer Maps
  - Faults Locations
  - Transmissivity
  - Storage Properties
- Total Estimated Recoverable Storage by Aquifer by GCD
- Water Budgets by Aquifer by GCD



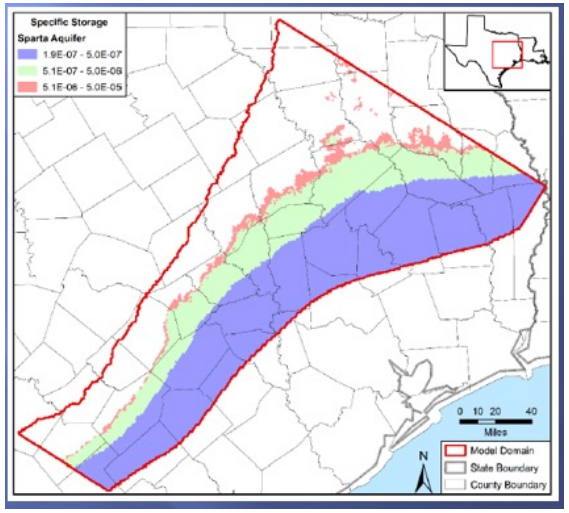
Aquifer Uses or Conditions (3rd Joint Planning Cycle)

Example: Sparta Information

Hydraulic Conductivity



Specific Storage



Total Estimated Recoverable Storage

County	Total Storage (acre-feet)	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Bastrop	2,500,000	625,000	1,875,000
Brazos	17,000,000	4,250,000	12,750,000
Burleson	16,000,000	4,000,000	12,000,000
Fayette	12,000,000	3,000,000	9,000,000
Lee	10,000,000	2,500,000	7,500,000
Leon	4,600,000	1,150,000	3,450,000
Madison	16,000,000	4,000,000	12,000,000
Robertson	1,300,000	325,000	975,000
Total	79,400,000	19,850,000	59,550,000

Water Budget for POSGCD

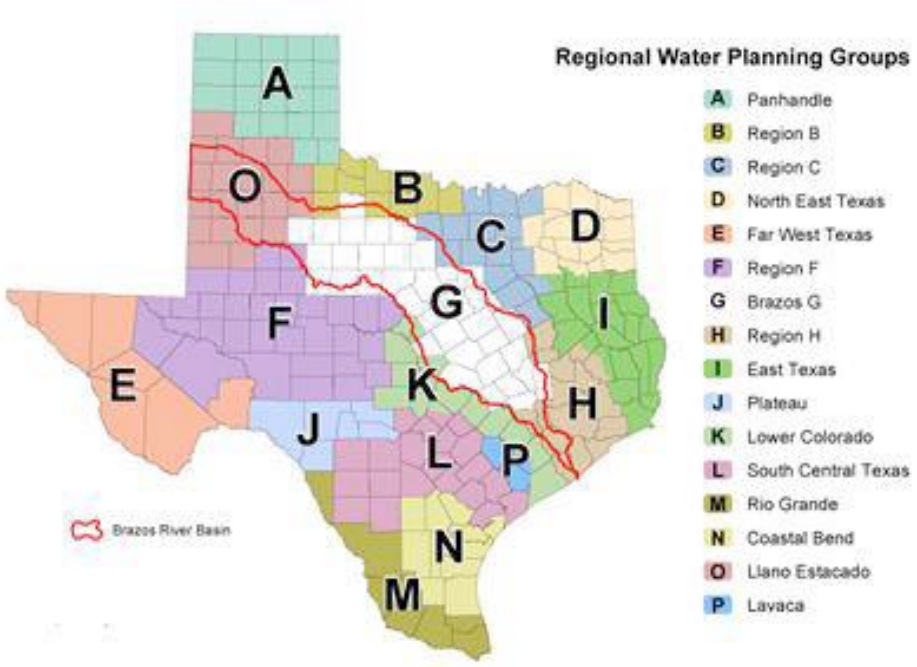
Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Sparta Aquifer	7,423
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Sparta Aquifer	4,808
Estimated annual volume of flow into the district within each aquifer in the district	Sparta Aquifer	763
Estimated annual volume of flow out of the district within each aquifer in the district	Sparta Aquifer	1,228
Estimated net annual volume of flow between each aquifer in the district	Weches Confining Unit and adjacent underlying areas into the Sparta Aquifer	1,583

Aquifer Hydrological Conditions (4th Joint Planning Cycle)

- Options for Expanded Descriptions
  - Water Budgets, Drawdown, & Available Drawdown
    - Pre-development (source of production, flow between GCDs, SW-GW)
    - Current
  - Analysis of Water Budgets by GCDs
    - Source of Water for current production
    - Changes in flow between GCDs, between surface water & groundwater
  - Analysis of Drawdown & Available Drawdowns
    - Evaluate GW resource
    - Evaluate wells (pumps setting & screens)
- Options for Expanded Considerations
  - Water Budgets, Drawdowns, and Available Drawdown for 2070 & later times
  - Account for Drawdowns for Areas of Interest (outcrops, exempt wells)
  - Decadal DFCs – thresholds to guide curtailments

Water Supply Needs & Water Management Strategies (3rd Joint Planning Cycle)

- Information from 2021 Regional Water Plans
  - Supply
  - Demand
  - Surplus/Need
  - Water Management Strategies
- Permit Data from GCDs
- MAGs from TWDB Reports

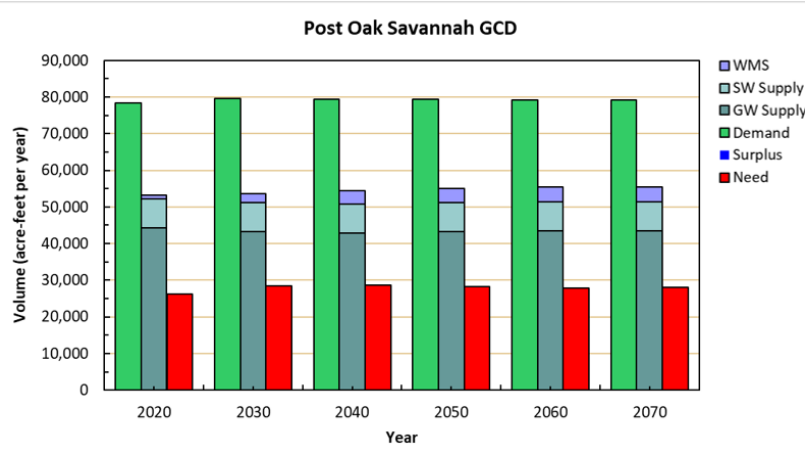


INTERA GEOSCIENCE & ENGINEERING SOLUTIONS

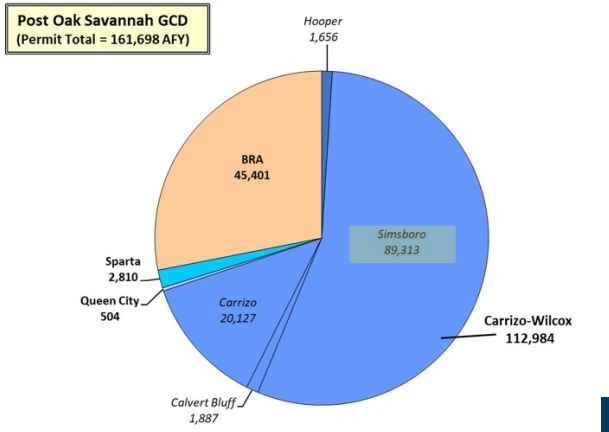
State Water Plan Definitions

- Supply
  - The amount of water that can be produced with current permits, current contracts, and existing infrastructure during drought
- Demand (Net)
  - Demand of the WUG during a drought after plumbing code savings are subtracted
- Surplus/Need
  - Difference between supply and demand
- Water Management Strategies
  - Water supply projects designed to meet needs for additional water supplies during drought
  - Some are associated with demand reduction or making supplies physically or legally available to users
- Availability
  - Maximum amount of water available during a drought, regardless of whether the supply is physically or legally available

Water Supply Needs & Water Management Strategies (3rd Joint Planning Cycle): Example. POSGCD



Post Oak Savannah GCD	2020	2030	2040	2050	2060	2070
Groundwater Supply – All Categories						
Brazos River Alluvium Aquifer	29,771	29,771	29,771	29,771	29,771	29,771
Carrizo-Wilcox Aquifer	9,576	8,646	8,143	8,581	8,761	8,730
Queen City Aquifer	303	306	306	306	306	306
Sparta Aquifer	1,496	1,496	1,496	1,496	1,496	1,496
Yegua-Jackson Aquifer	2,992	2,992	2,992	2,992	2,992	2,992
Trinity Aquifer	102	100	98	98	96	94
Groundwater Supply Total	***44,240***	***43,311***	***42,806***	***43,244***	***43,422***	***43,389***
Surface Water Supply – All Categories						
Local Surface Water Supply	4,151	4,151	4,151	4,151	4,151	4,151
Brazos River Authority Little River Lake/Reservoir System	971	959	948	947	934	921
Brazos River Run-of-River	2,834	2,834	2,834	2,834	2,834	2,833
Surface Water Supply Total	***7,956***	***7,944***	***7,933***	***7,932***	***7,919***	***7,905***
Total Supply – All Categories	**52,196**	**51,255**	**50,739**	**51,176**	**51,341**	**51,294**
Total Demand – All Categories	***78,472***	***79,681***	***79,477***	***79,364***	***79,242***	***79,261***
Total Surplus/Need – All Categories	***-26,276***	***-28,426***	***-28,738***	***-28,188***	***-27,901***	***-27,967***



Sponsor Entity	Water Management Strategy	Type	Source County	Recipient County	2020	2030	2040	2050	2060	2070
CALDWELL	MUNICIPAL WATER CONSERVATION	Conservation	BURLESON	Burleson	-	83	167	239	242	246
IRRIGATION, BURLESON	IRRIGATION WATER CONSERVATION	Conservation	BURLESON	Burleson	804	1,340	1,876	1,876	1,876	1,876
MANUFACTURING, BURLESON	INDUSTRIAL WATER CONSERVATION	Conservation	BURLESON	Burleson	4	6	8	8	8	8
MANUFACTURING, BURLESON	SPARTA AQUIFER DEVELOPMENT	Groundwater	BURLESON	Burleson	25	25	25	25	25	25
SNOOK	MUNICIPAL WATER CONSERVATION	Conservation	BURLESON	Burleson	-	25	50	78	104	129
SOMERVILLE	MUNICIPAL WATER CONSERVATION	Conservation	BURLESON	Burleson	-	20	25	27	29	31
SOUTHWEST MILAM WSC	CARRIZO AQUIFER DEVELOPMENT	Groundwater	LEE	Burleson	-	17	29	27	29	38
SOUTHWEST MILAM WSC	MUNICIPAL WATER CONSERVATION	Conservation	BURLESON	Burleson	-	2	4	5	5	6
BELL MILAM FALLS WSC	MUNICIPAL WATER CONSERVATION	Conservation	MILAM	Milam	-	1	1	1	1	1
CAMERON	MUNICIPAL WATER CONSERVATION	Conservation	MILAM	Milam	-	107	218	339	449	465
IRRIGATION, MILAM	IRRIGATION WATER CONSERVATION	Conservation	MILAM	Milam	195	325	455	455	455	455

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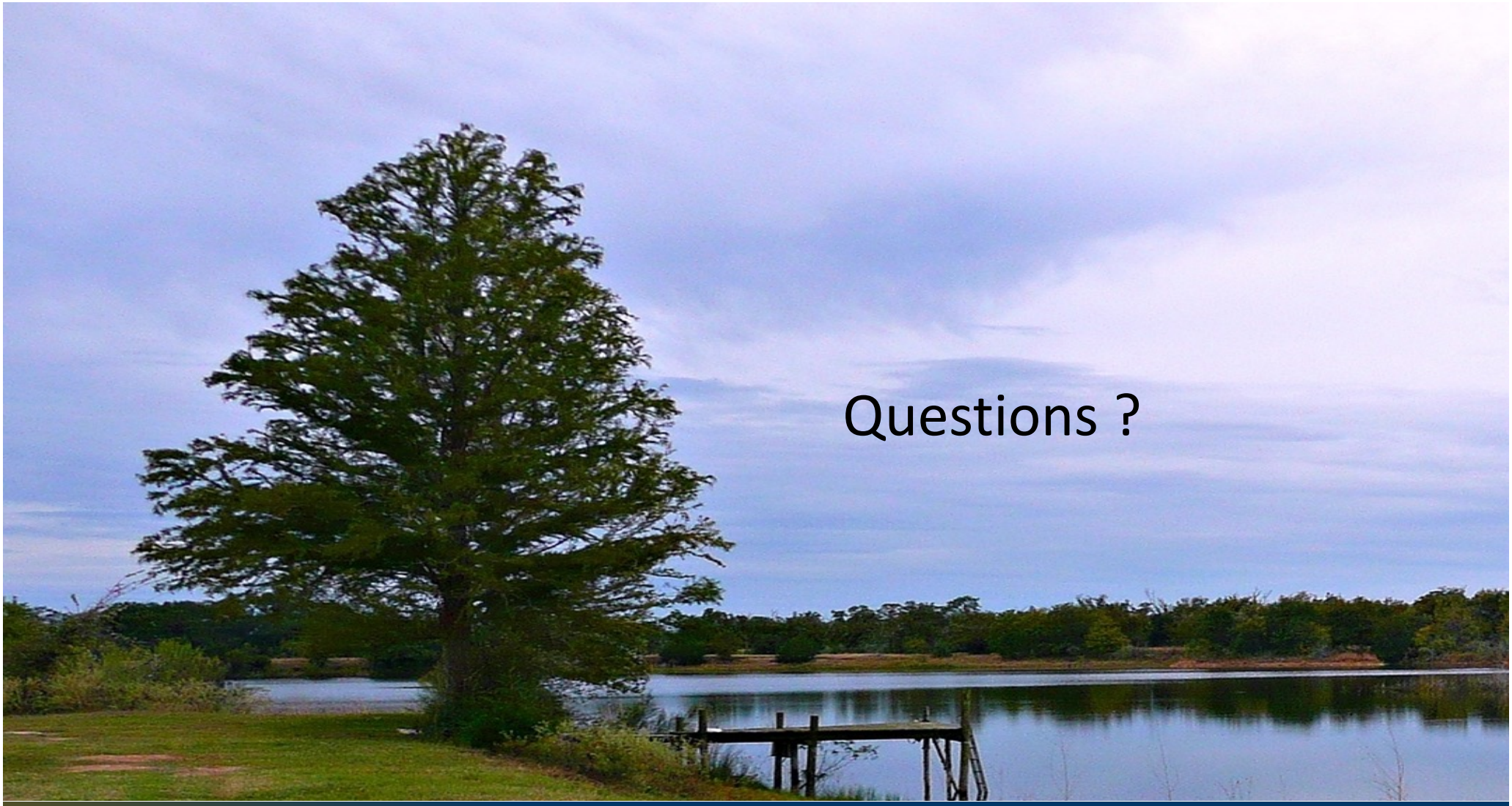
Water Supply Needs & Water Management Strategies (4rd Joint Planning Cycle)

- Options for Expanded Descriptions
  - Define “Needs of the State”
    - Key term in TWC §36.0015 (GCD are preferred method of groundwater management)
    - Current Permits, State Water Plans, Strategies
  - Define “Water Supply Needs”
    - Local GCD Needs
    - Local GMA 12 Needs
    - State Needs
    - Current Production versus Future Production
- Options for Expanded Considerations
  - Local Demands and Needs
  - Conservation for Future Demands and Needs (curtailment, ASR, Conjunctive Use)
  - Assessment of Sustainable Production


Questions ?