GMA 8
NTW GAM Runs 1 – 3,
Aquifer Use,
Water Supply Needs,
Water Management Strategies, and
Private Property Rights

July 29, 2014

Cleburne, Texas

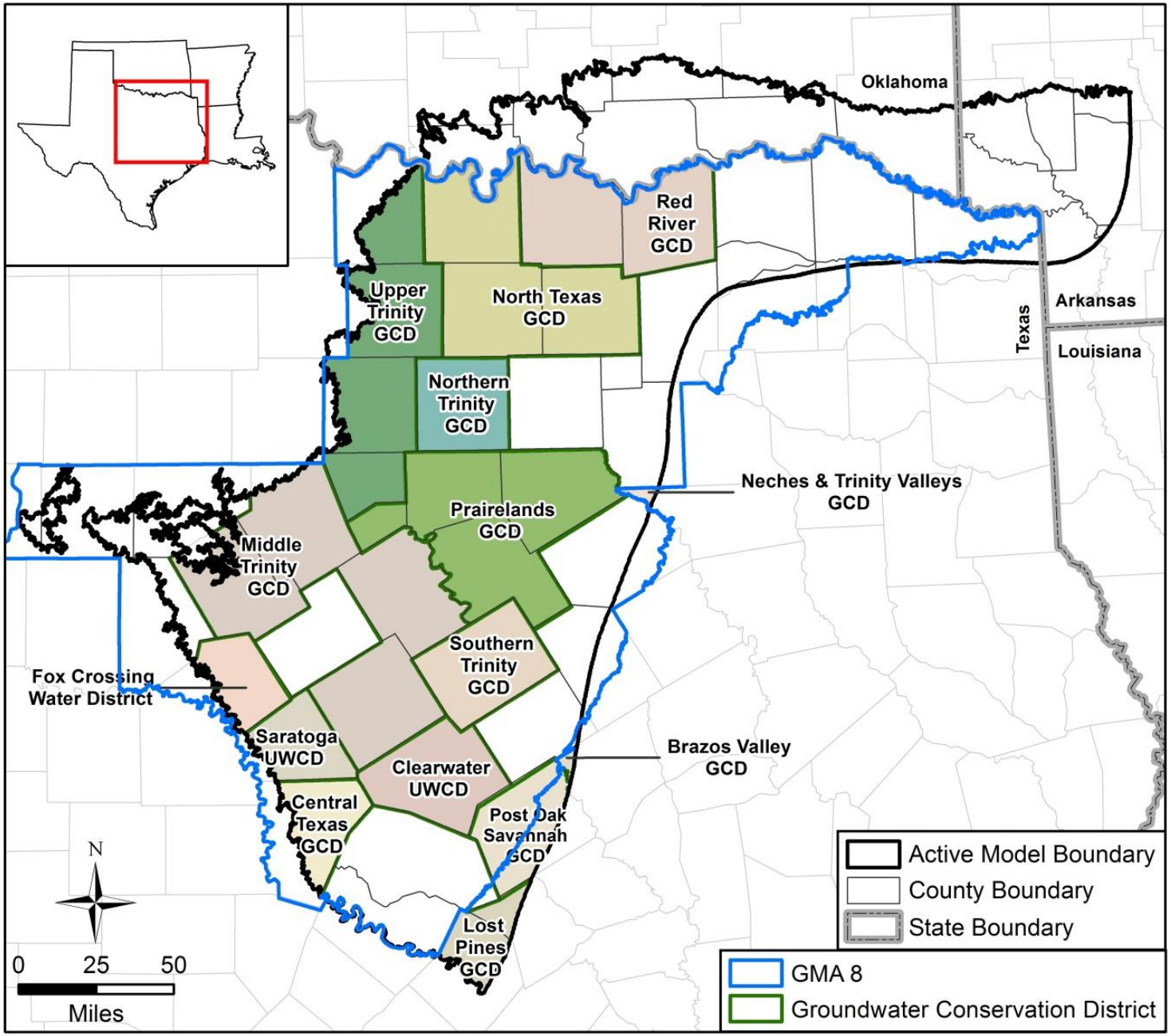
Agenda Item 6

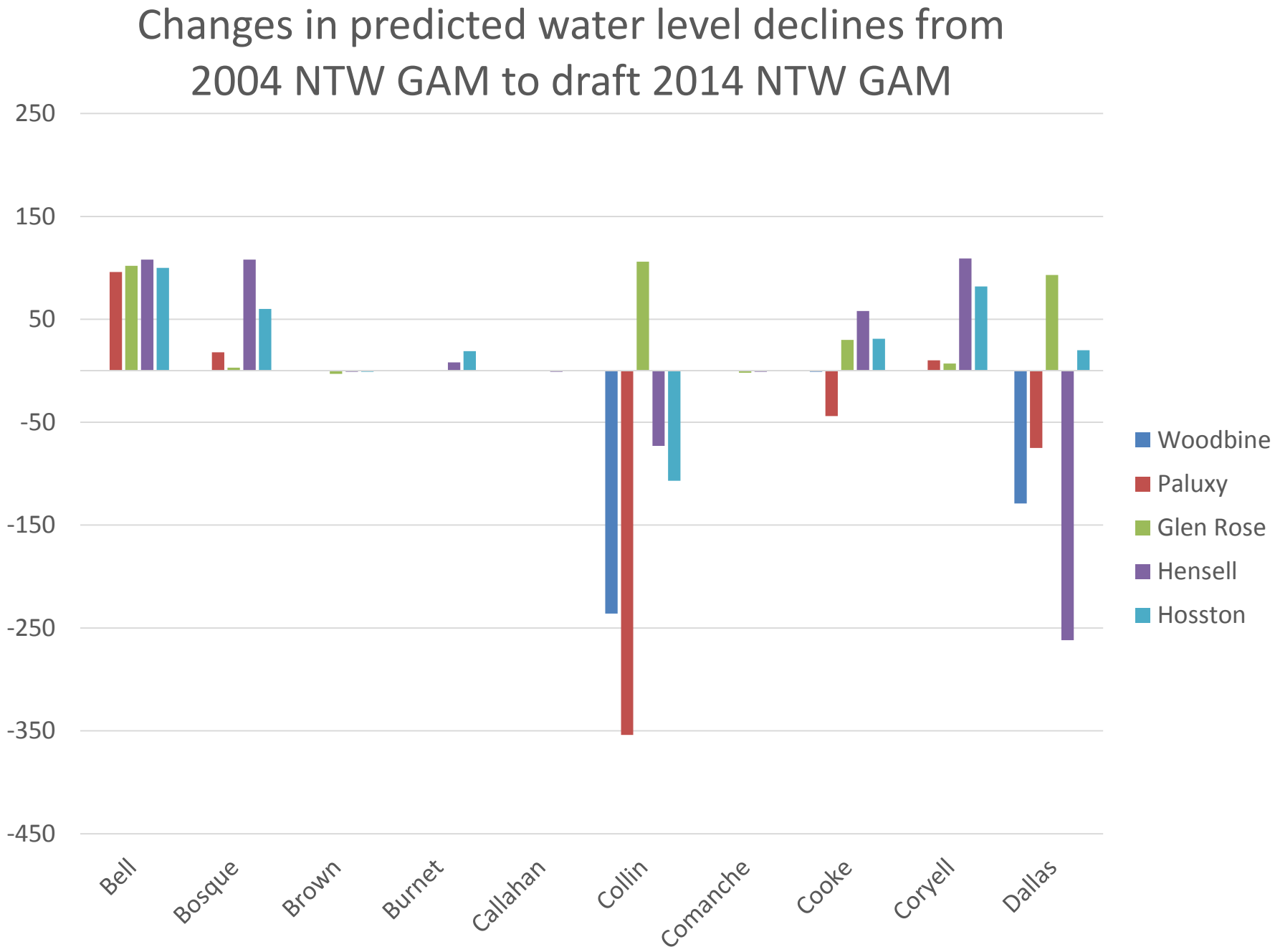
NTW GAM Runs 1 – 3

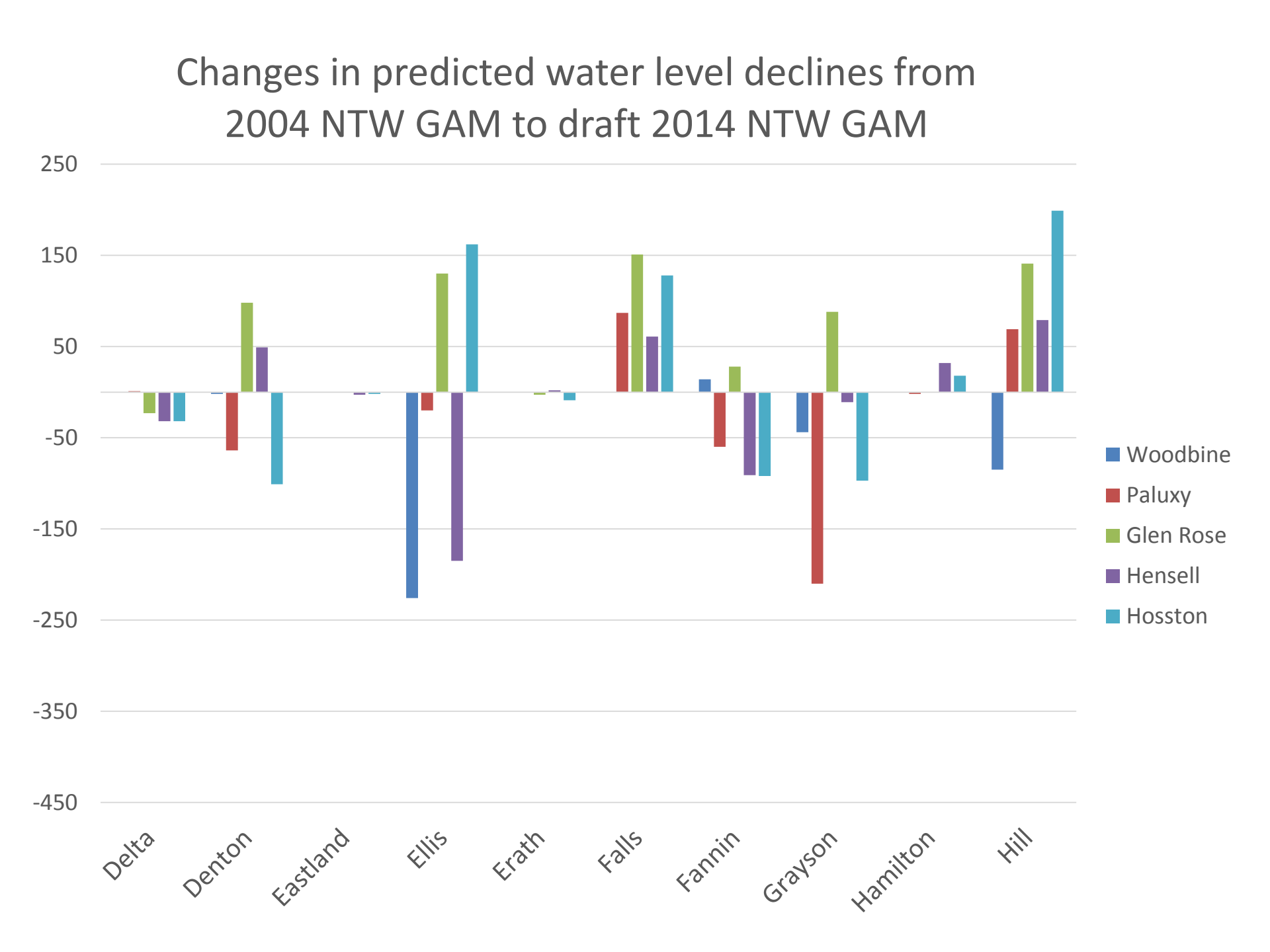
- Brief overview of Northern Trinity/Woodbine GAM Run (GR) 1 utilizing the updated Northern Trinity/Woodbine Aquifer GAM
  - Draft technical memorandum regarding Northern Trinity/Woodbine GR 1 distributed June 19 to all GMA 8 GCDs
  - GR 1 executed for the sole purpose of understanding, at a county and aquifer level, differences in drawdown in the old and new northern Trinity and Woodbine aquifers GAMs.

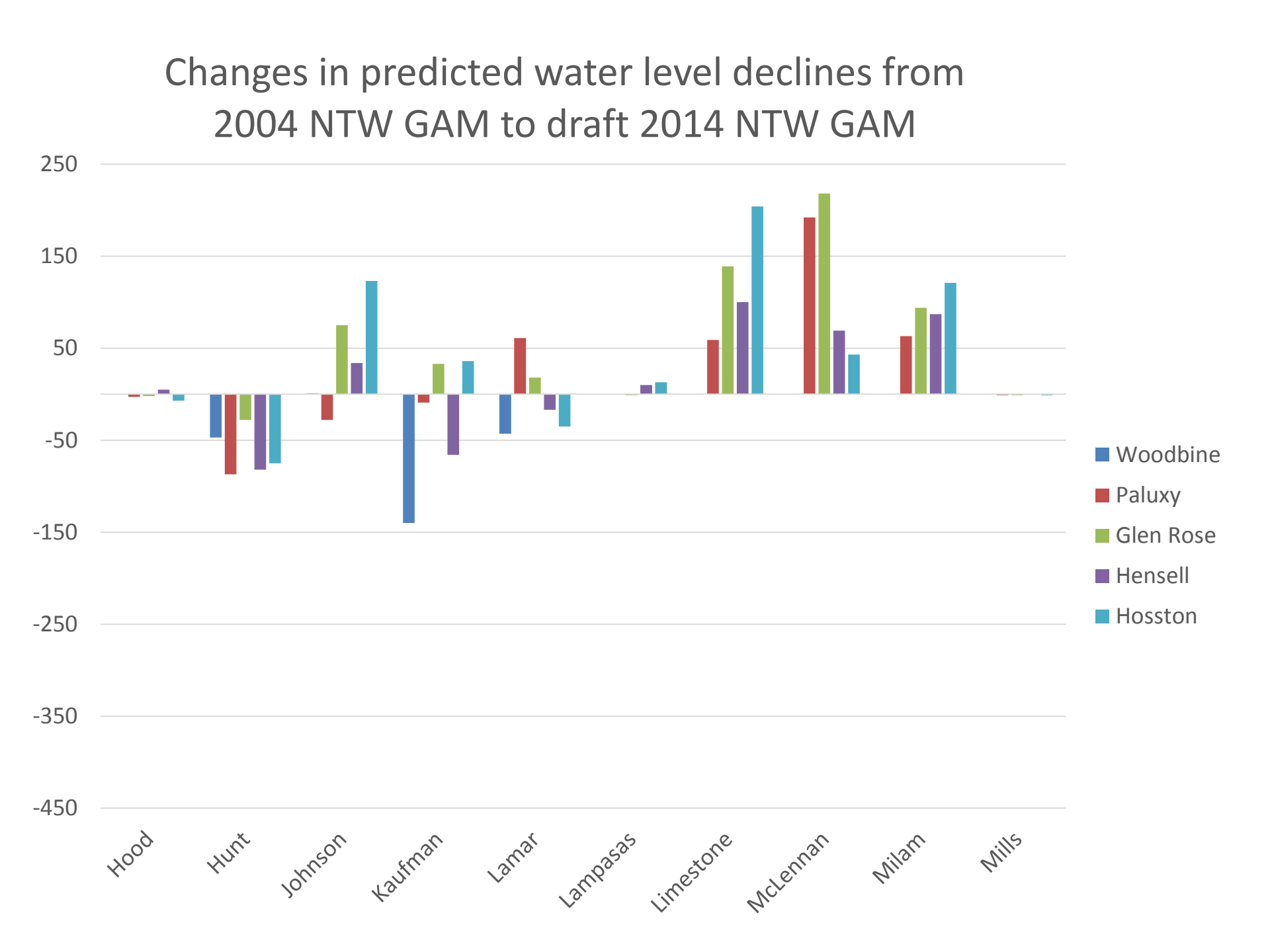
GR 1

- GR 1
  - In 2004 NTW GAM, the DFC was estimated as an average decline in simulated water level (drawdown) from the year 2000 to 2050 assuming a constant pumping rate equal to the MAG.
  - GR I based on pumping the MAG per aquifer and per county in the draft NTW Model and calculating average drawdown per aquifer and per county from 2000 to 2050.

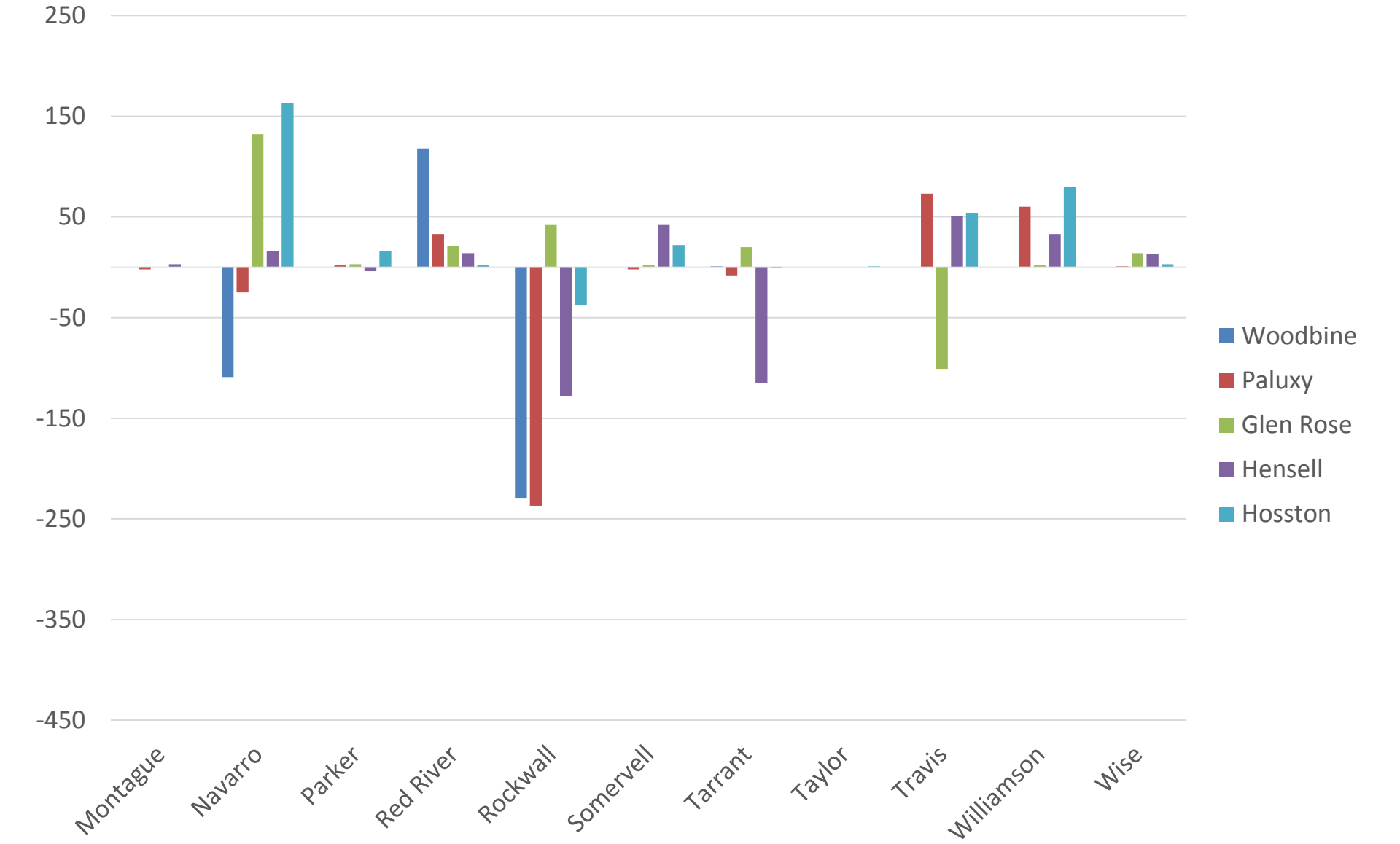

Oklahoma
Red River GCD
Upper Trinity GCD
North Texas GCD
Arkansas
Texas
Louisiana
Northern Trinity GCD
Neches & Trinity Valleys GCD
Prairelands GCD
Middle Trinity GCD
Southern Trinity GCD
Fox Crossing Water District
Saratoga UWCD
Brazos Valley GCD
Clearwater UWCD
Central Texas GCD
Post Oak Savannah GCD
Lost Pines GCD
N
0 25 50
Miles
Active Model Boundary
County Boundary
State Boundary
GMA 8
Groundwater Conservation District


Changes in predicted water level declines from 2004 NTW GAM to draft 2014 NTW GAM
250
150
50
-50
-150
-250
-350
-450
Bell
Bosque
Brown
Burnet
Callahan
Collin
Comanche
Cooke
Coryell
Dallas
Woodbine
Paluxy
Glen Rose
Hensell
Hosston


Changes in predicted water level declines from 2004 NTW GAM to draft 2014 NTW GAM
250
150
50
-50
-150
-250
-350
-450
Delta
Denton
Eastland
Ellis
Erath
Falls
Fannin
Grayson
Hamilton
Hill
Woodbine
Paluxy
Glen Rose
Hensell
Hosston


Changes in predicted water level declines from 2004 NTW GAM to draft 2014 NTW GAM
250
150
50
-50
-150
-250
-350
-450
Hood
Hunt
Johnson
Kaufman
Lamar
Lampasas
Limestone
McLennan
Milam
Mills
Woodbine
Paluxy
Glen Rose
Hensell
Hosston

Changes in predicted water level declines from 2004 NTW GAM to draft 2014 NTW GAM



GR 2/3 and GMA 8

- During April 22, 2014 GMA 8 meeting, input on the two GRs requested.
- By July 18, the deadline for requests for DFCs to be modeled utilizing two remaining GRs (that are funded by the current contract) 8 GCDs requested that the GRs be utilized to quantify “bookends” required by Texas Water Code 36.108 (d-2).

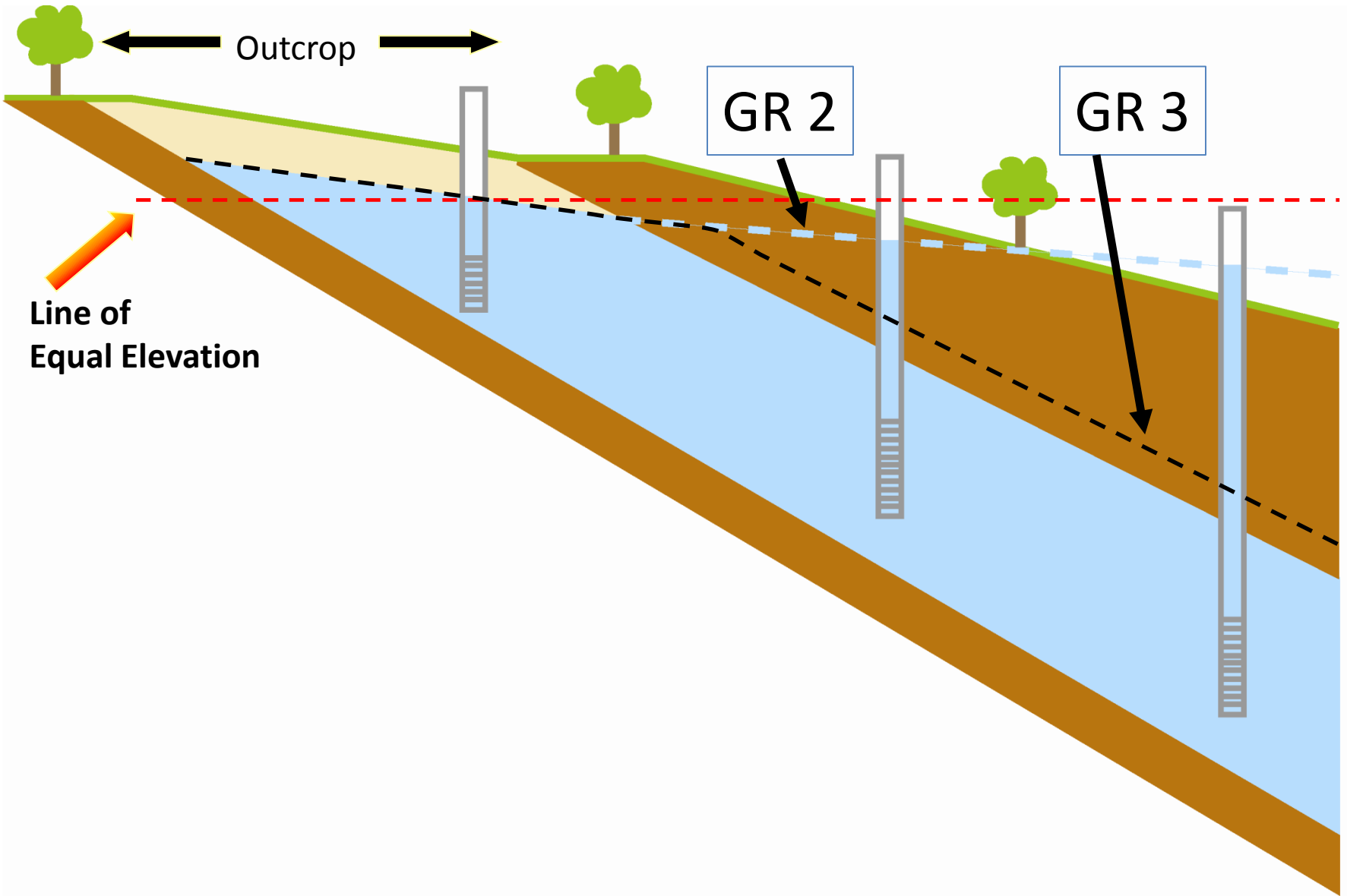
GR 2

- GR 2 will quantify a DFC that generally stabilizes future water levels during the planning horizon. The goal of this GR is to calculate how much water could be pumped from each aquifer in each county if water levels in each aquifer stabilized or reached a state of equilibrium by the end of 2070. This stable condition will not be achieved immediately, but by end of planning period, i.e., a ramping approach. This run will serve as one important “book end” on how much water could be pumped from the aquifer on a “sustainable” basis.

GR 3

- GR 3 will evaluate a DFC that would allow for more aggressive groundwater development and use over the planning period The goal of GR 3 is to quantify pumping where water levels in the outcrop are sustainable (not dewatered), but would allow water levels in each layer (Hosston, Hensell, Paluxy, Glen Rose, and Woodbine) to drop from current levels to the top of the respective aquifer layer in the subcrop through 2070; water levels dropping no further than to the top of each aquifer at which point the aquifers become unconfined.

Unconfined versus Confined



GR 1 – 3

- The final results from GR 1 – 3, along with the final Northern Trinity and Woodbine Aquifers GAM Report and Model will be submitted to the TWDB for approval as the updated GAM on September 1, 2014.

Agenda Item 9

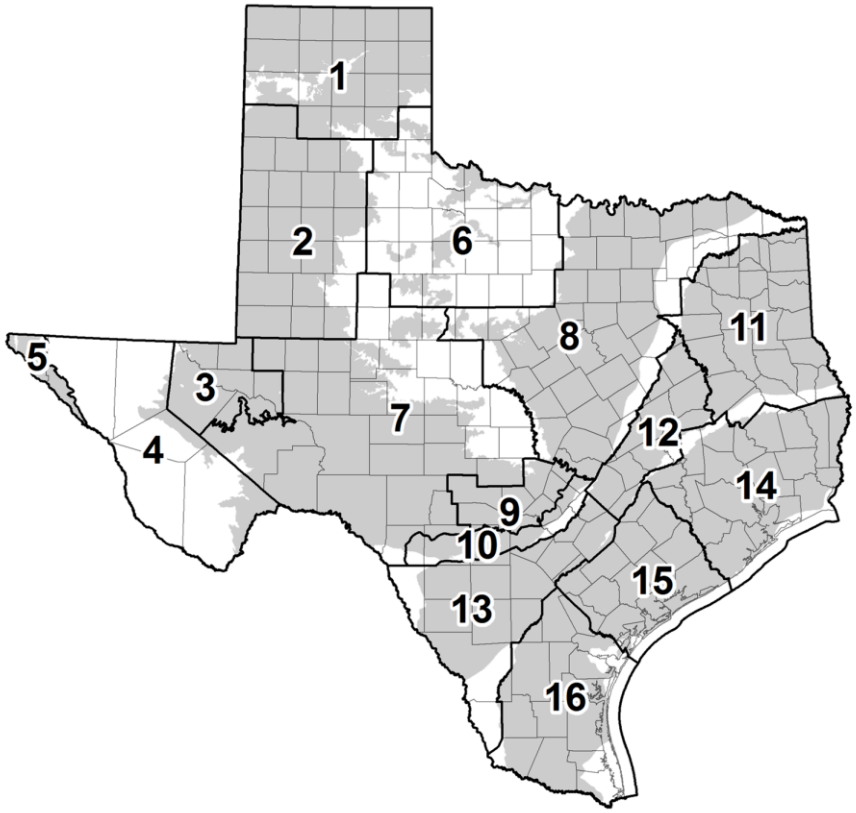
Aquifer Uses and Conditions

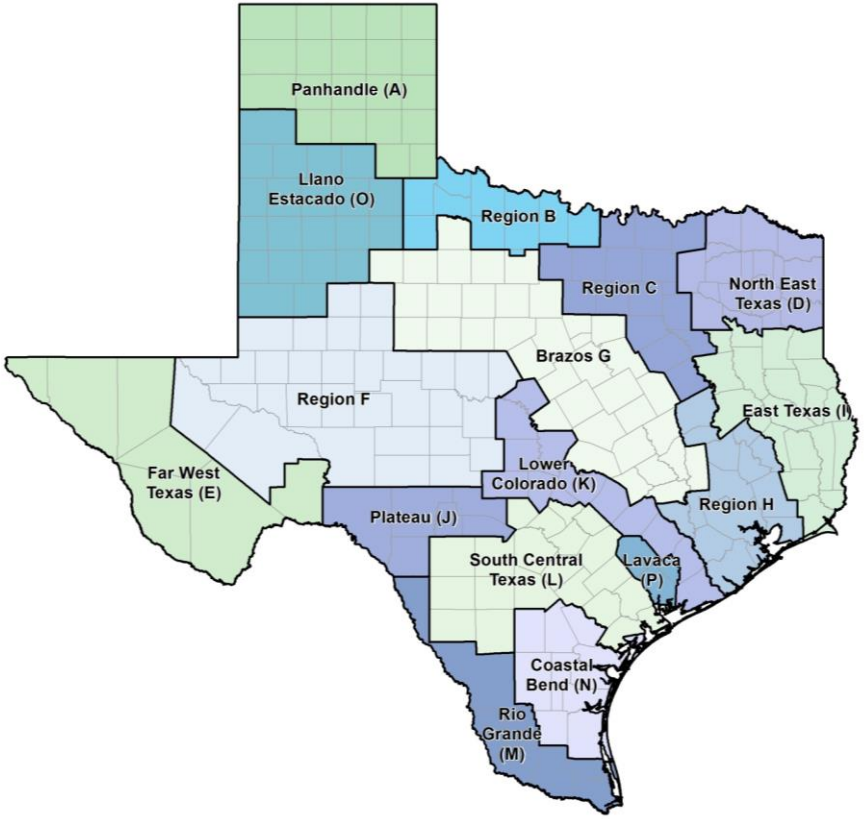
- Districts shall consider aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another. Texas Water Code 36.108 (d)(1)

Aquifer Uses and Conditions

- This is **a preliminary discussion**, we will need to revisit when proposed DFCs are selected.
- Aquifer uses – consideration is a function of scale of management.
  - GMA
  - GCD
  - County
  - Water use sector
  - Aquifer (or subdivision of an aquifer)

Water Planning in Texas





Primary Groundwater Use Data Source

- The primary source for GMA 8 for water use (including groundwater use) is the TWDB Water Use Survey (Texas Water Code 16.012 (m)) as follows:

The executive administrator may conduct surveys of entities using groundwater and surface water at intervals determined appropriate by the executive administrator to gather data to be used for long-term water supply planning. Recipients of the survey shall complete and return the survey to the executive administrator. A person who fails to timely complete and return the survey is not eligible for funding from the board for board programs and is ineligible to obtain permits, permit amendments, or permit renewals from the commission under Chapter 11. A person who fails to complete and return the survey commits an offense that is punishable as a Class C misdemeanor. Surveys obtained by the board from nongovernmental entities are excepted from the requirements of Section 552.021, Government Code, unless otherwise directed in writing by the person completing the survey. This subsection does not apply to survey information regarding windmills used for domestic and livestock use.

TWDB Water Use Survey Database

- TWDB Water Use Survey, participation was voluntary from 1980 – 2001, and mandatory since 2001.
- For historical groundwater use, information is available by:
  - Reporting entity (city, MUD, SUD, WSC, non-municipal sectors)
  - County
  - Aquifer
  - Water use sector
  - Pumped vs. Used

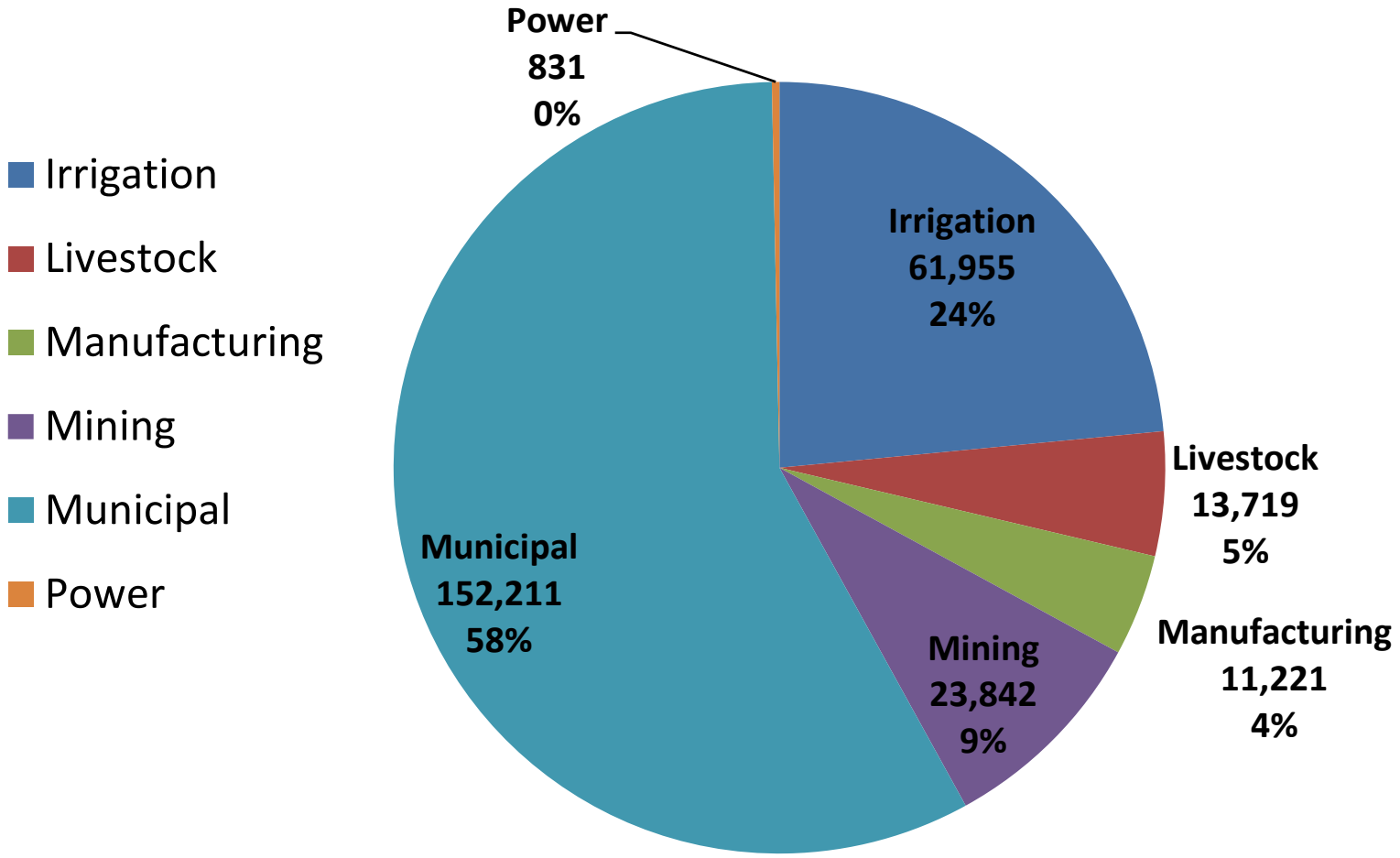
TWDB Water Use Survey Database

- All data presented in this presentation for consideration as required by TWC 36.108 (d)(1) are included in:
  - TWDBGroundwaterPumping_2007-2011_GMA8_Detail.pdf
  - TWDBGroundwaterPumping_2007-2011_GMA8_bySector.pdf

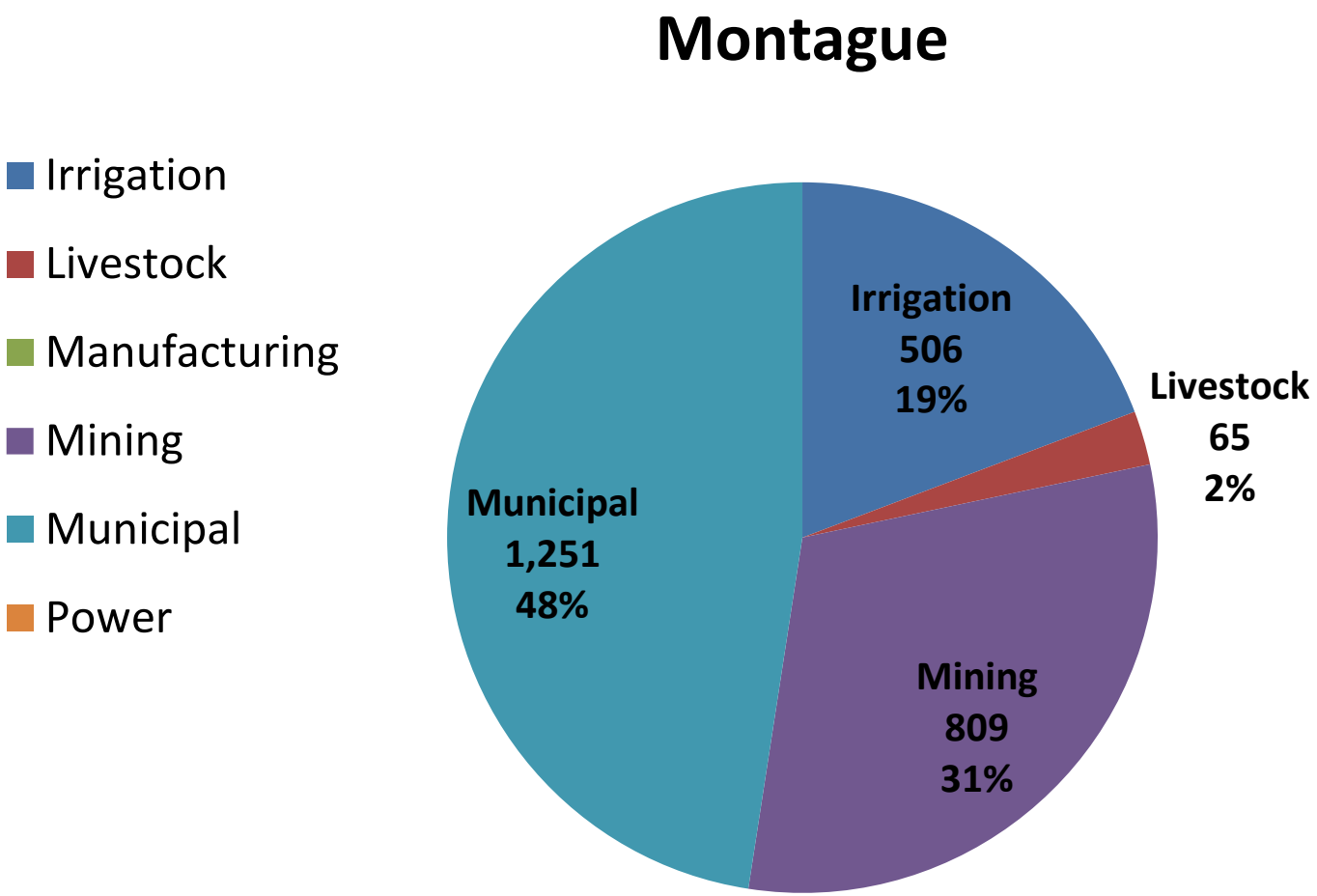
GMA 8 Water Use

- Water use information presented is the average groundwater pumping from 2007 – 2011.
- For data on individual years or other more detailed information please see tables provided.

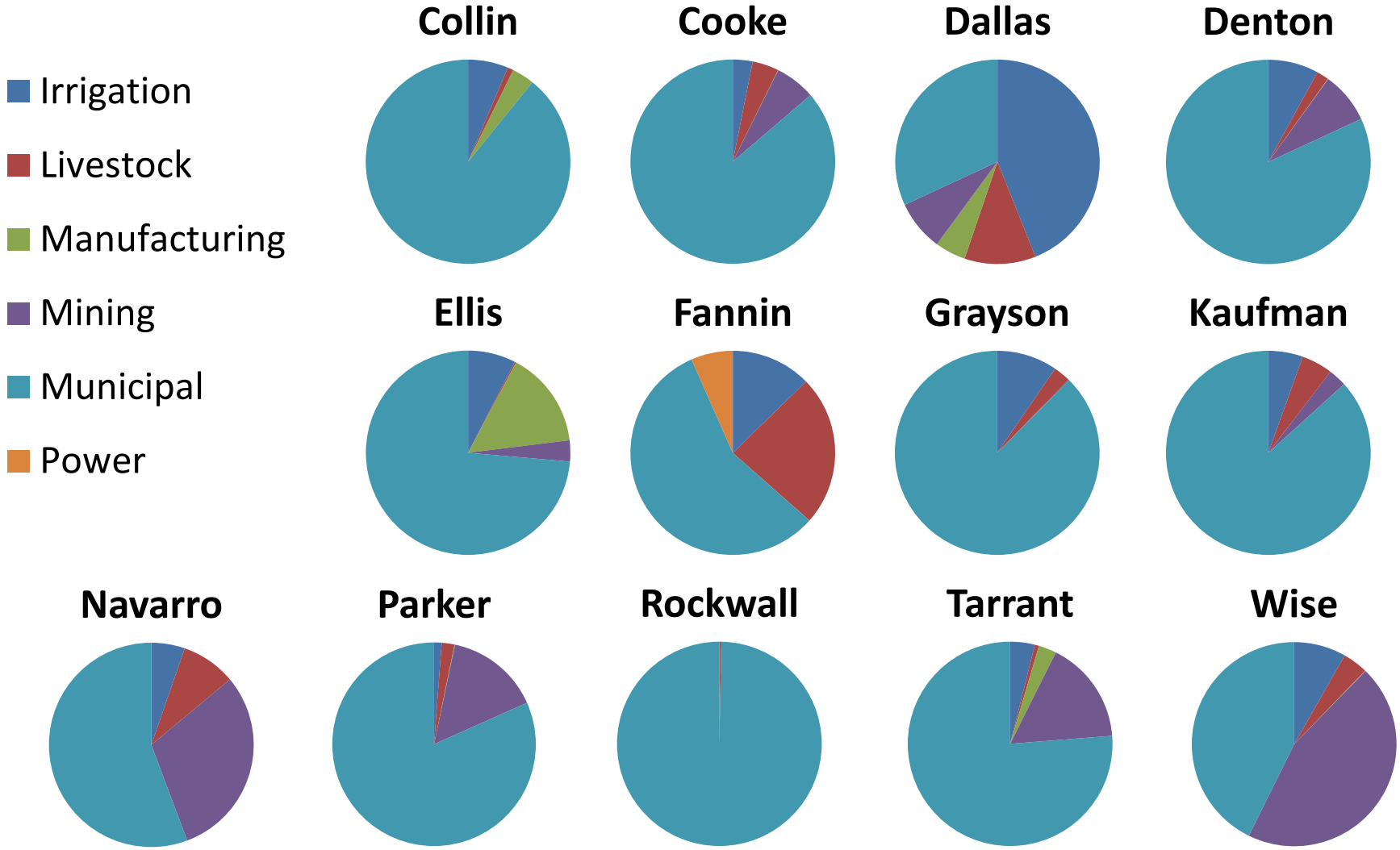
Groundwater Pumping by Type in GMA 8



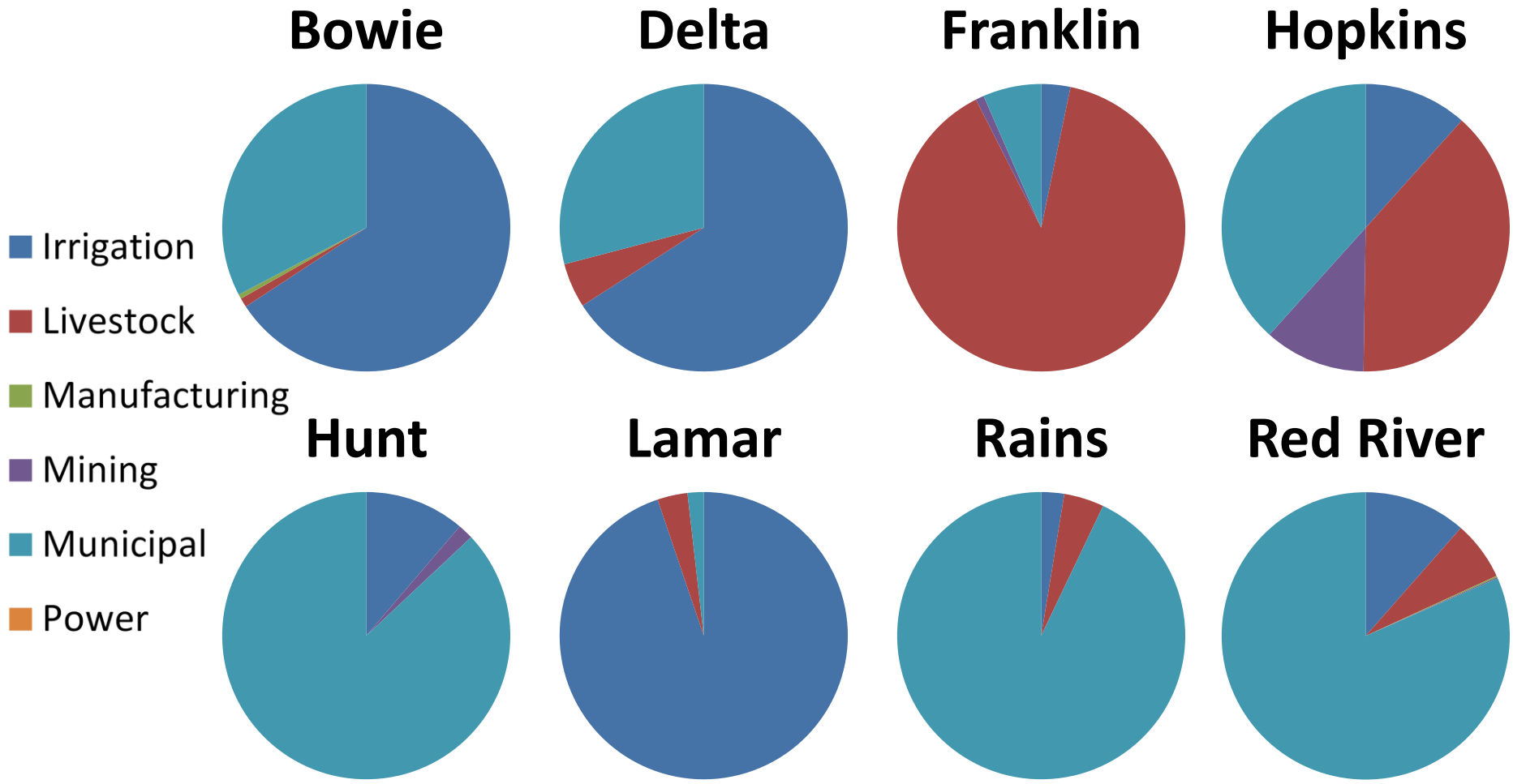
Groundwater Pumping by Type in GMA 8 – Region B



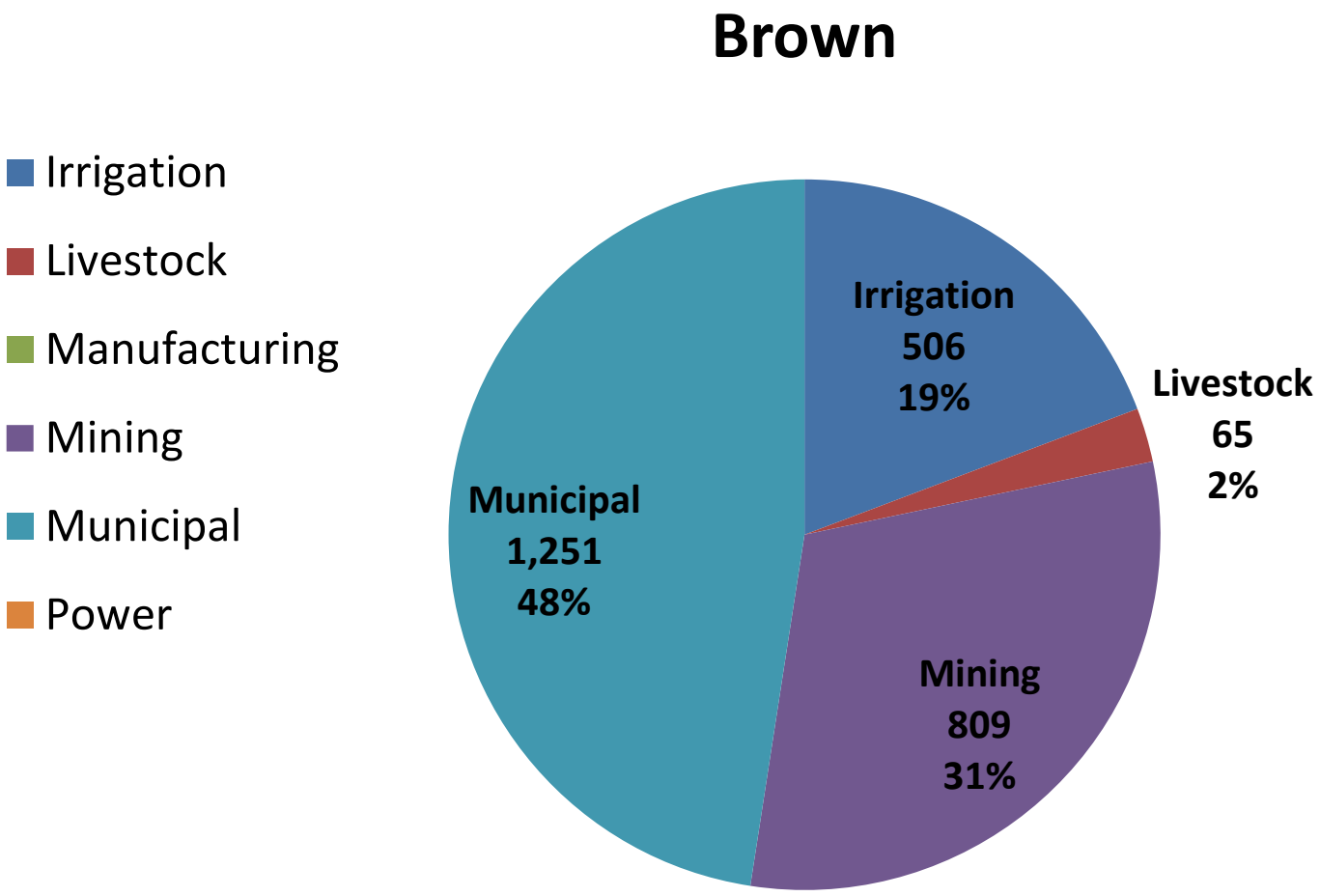
Groundwater Pumping by Type in GMA 8 – Region C



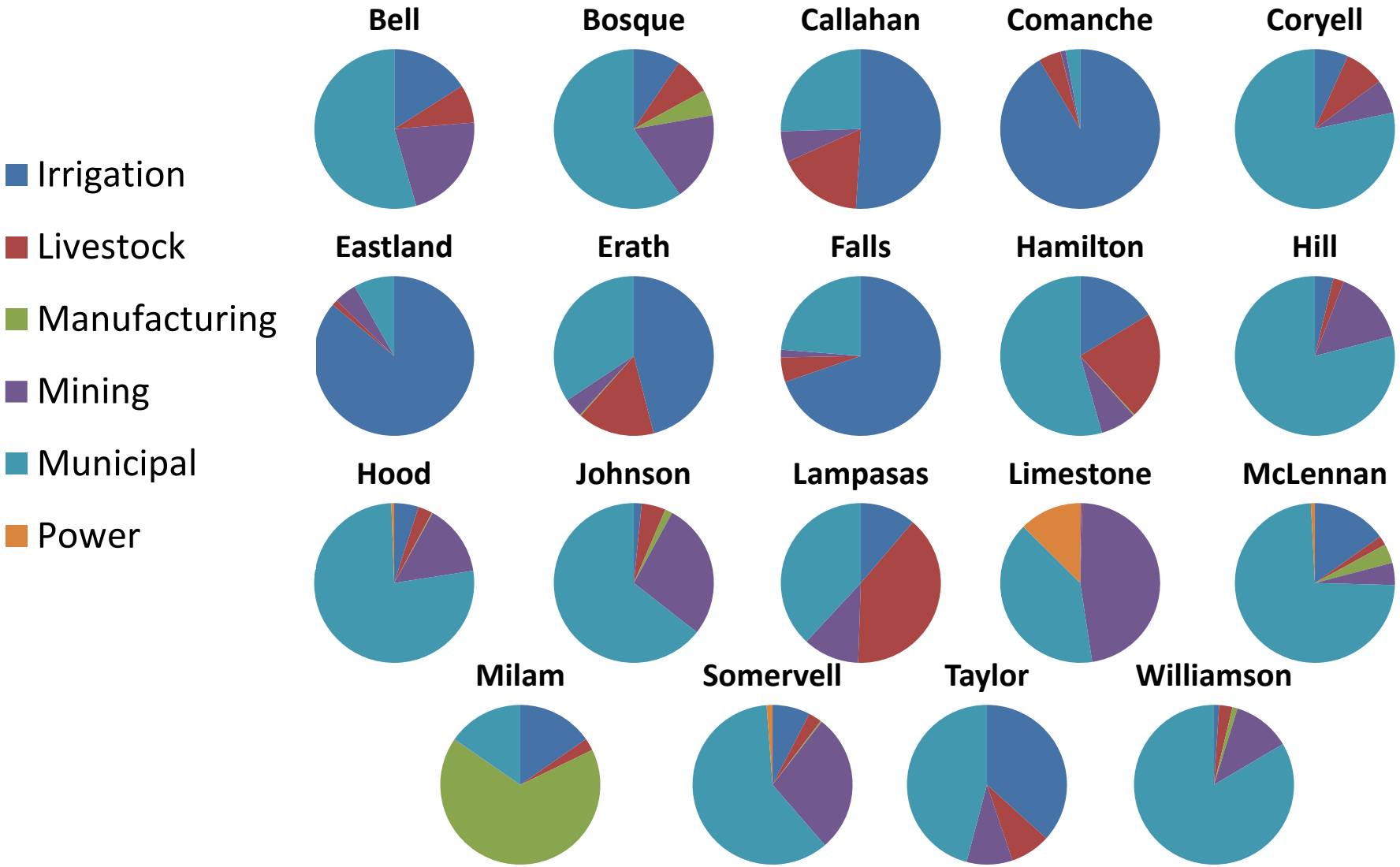
Groundwater Pumping by Type in GMA 8 – Region D



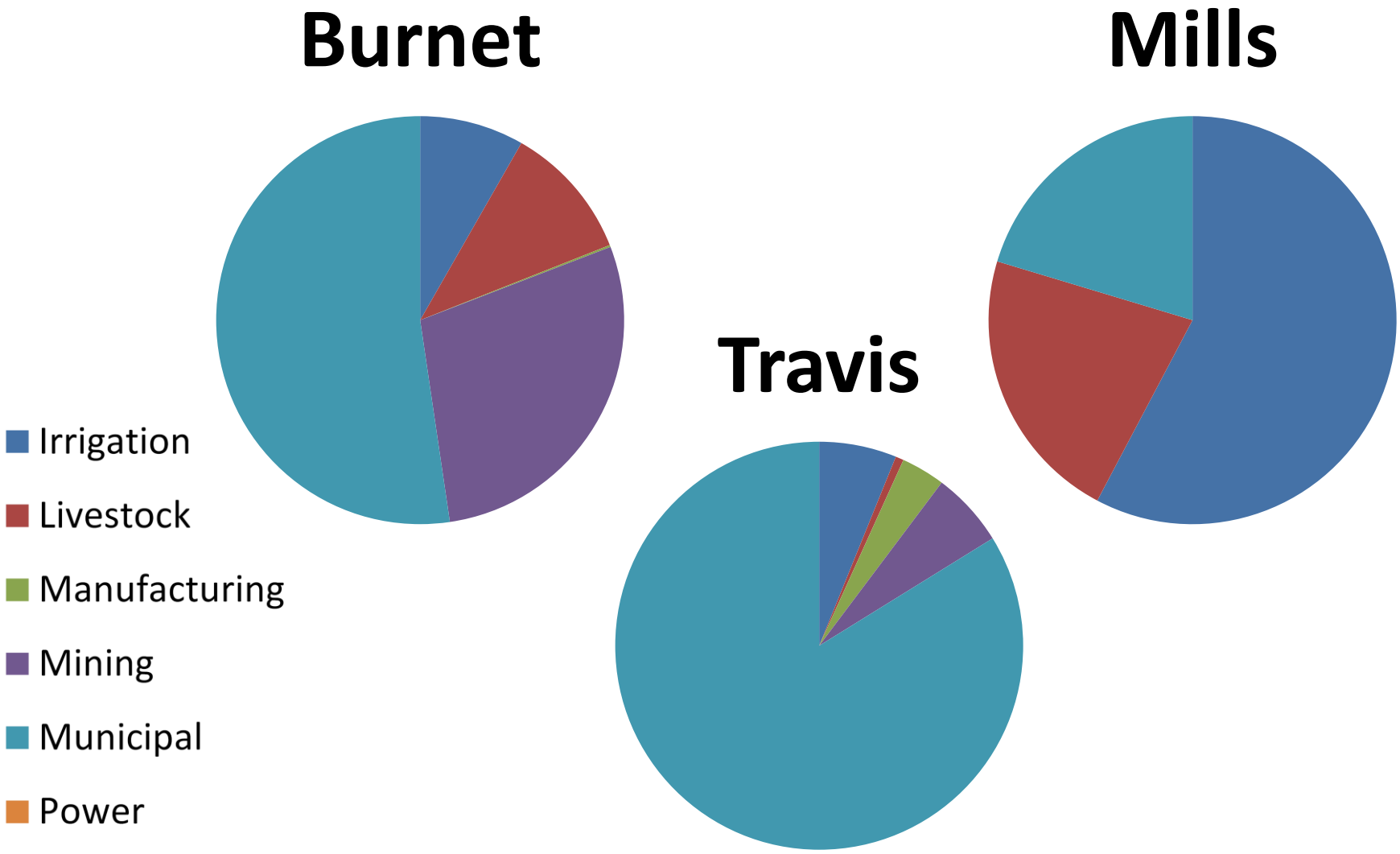
Groundwater Pumping by Type in GMA 8 – Region F



Groundwater Pumping by Type in GMA 8 – Region G

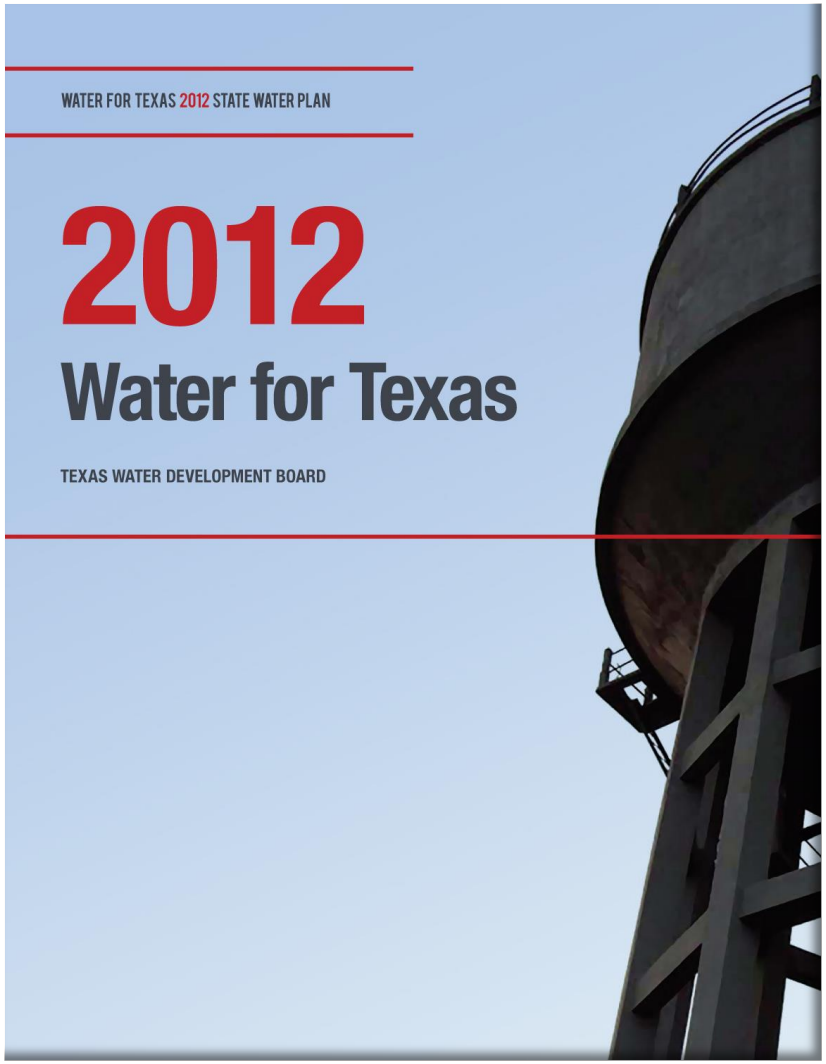


Groundwater Pumping by Type in GMA 8 – Region K



Water Supply Needs and Water Management Strategies

- The districts shall consider water supply needs and water management strategies included in the state water plan. Texas Water Code 36.108 (d)(2)



Water Planning Definitions (from 31 TAC 357)

- The definition of **water demand** (projections) as opposed to estimates of water use, in the planning process, is the volume of water projected to be needed during drought conditions. Water demand projections are always for the future. For the regional water planning process, they are calculated on a decadal basis.

Water Planning Definitions

- The difference in **water demands** and **water supplies** on a **water user group** or **wholesale water supplier** basis quantifies surpluses and ***needs***.
- **Water availability** is the maximum amount of water available from a source during the drought of record, regardless of whether the supply is physically or legally available to **water user groups**.
- Existing **water supply** is the maximum amount of water available from existing sources for use during drought of record conditions that is physically and legally available for use by a water user group

Water Planning Definitions

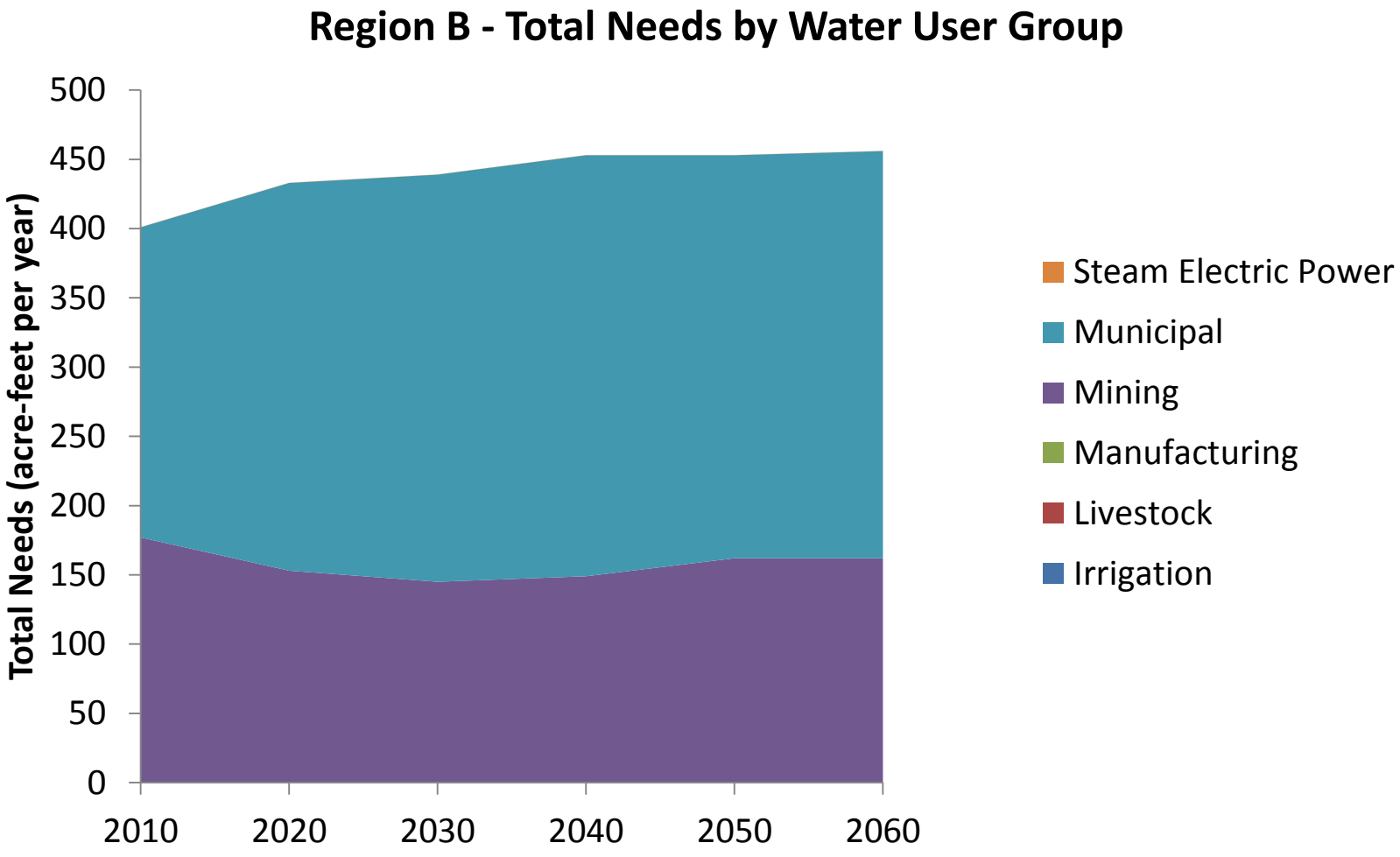
- **Water Management Strategy--**A plan or specific project to meet a **need** for additional water by a discrete user group, which can mean increasing the total water supply or maximizing an existing supply, including through reducing demands
- **Water User Group (WUG)--**Identified user or group of users for which water demands and water supplies have been identified and analyzed and plans developed to meet water needs.

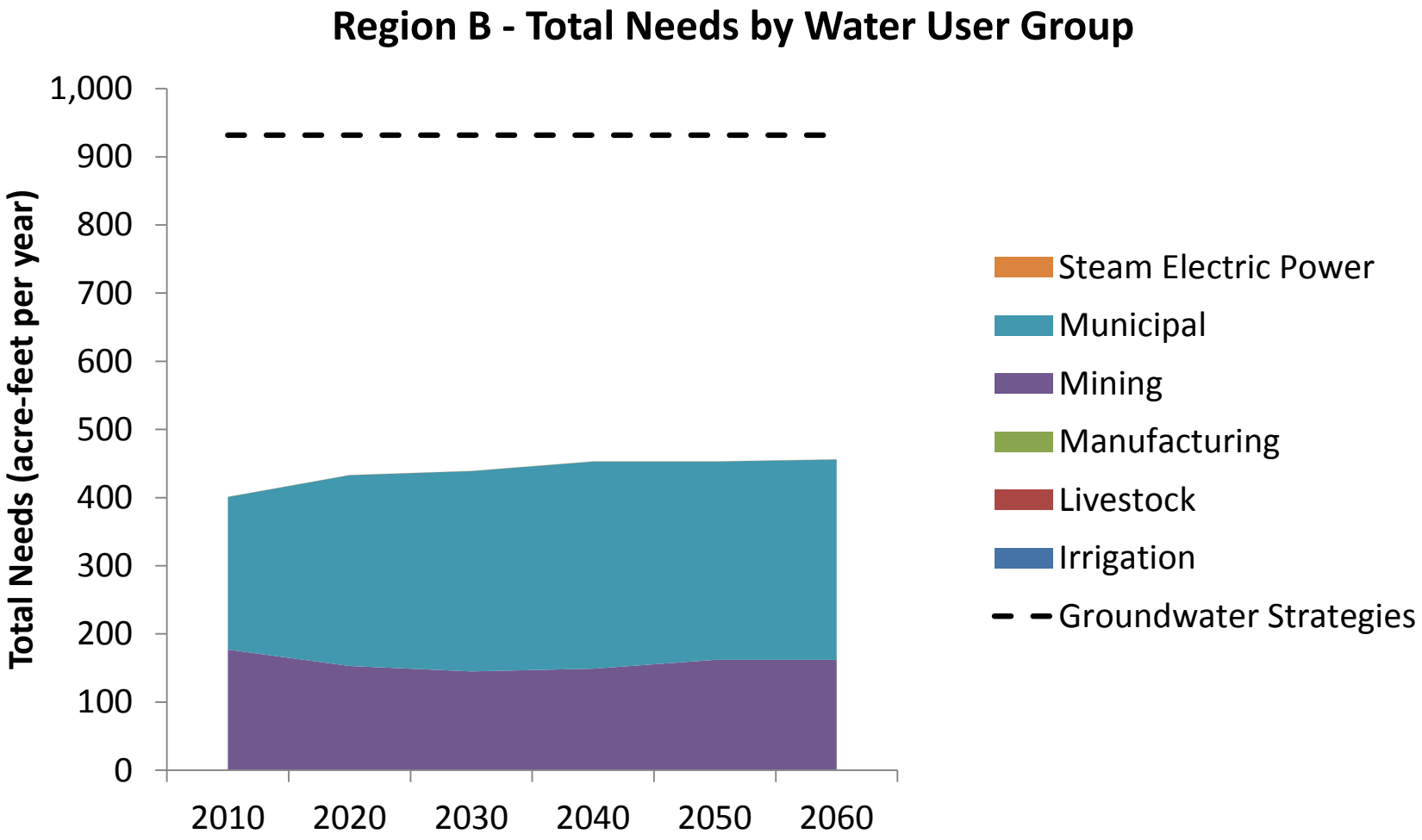
Water Planning Definitions

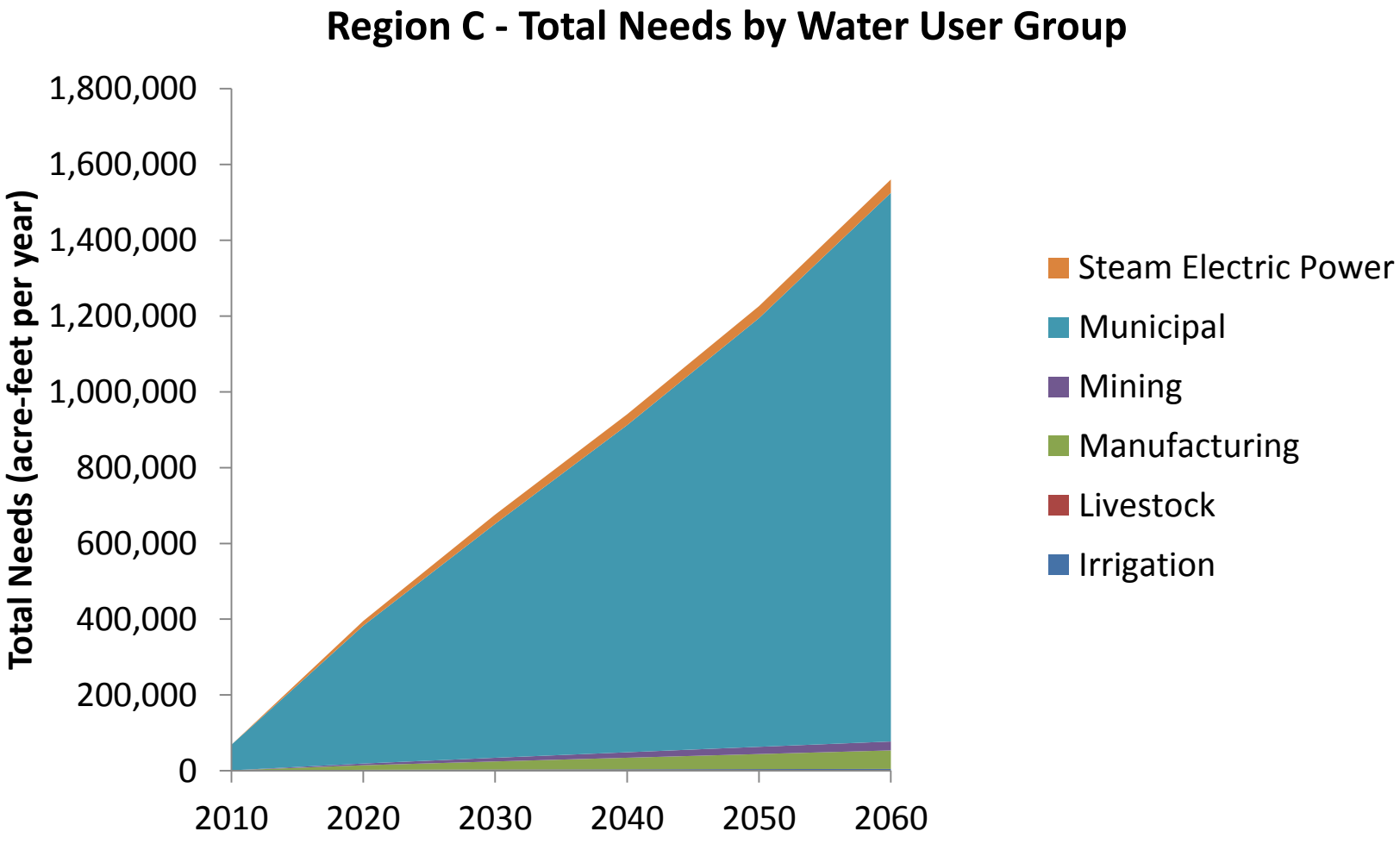
- **WUGs** include cities, and on a county aggregate basis rural, manufacturing, irrigation, steam electric power generation, mining, and livestock watering for each county.
- **Wholesale Water Provider (WWP)--**Any person or entity, including river authorities and irrigation districts, that has contracts to sell more than 1,000 acre-feet of water wholesale in any one year during the five years immediately preceding the adoption of the last regional water plan.

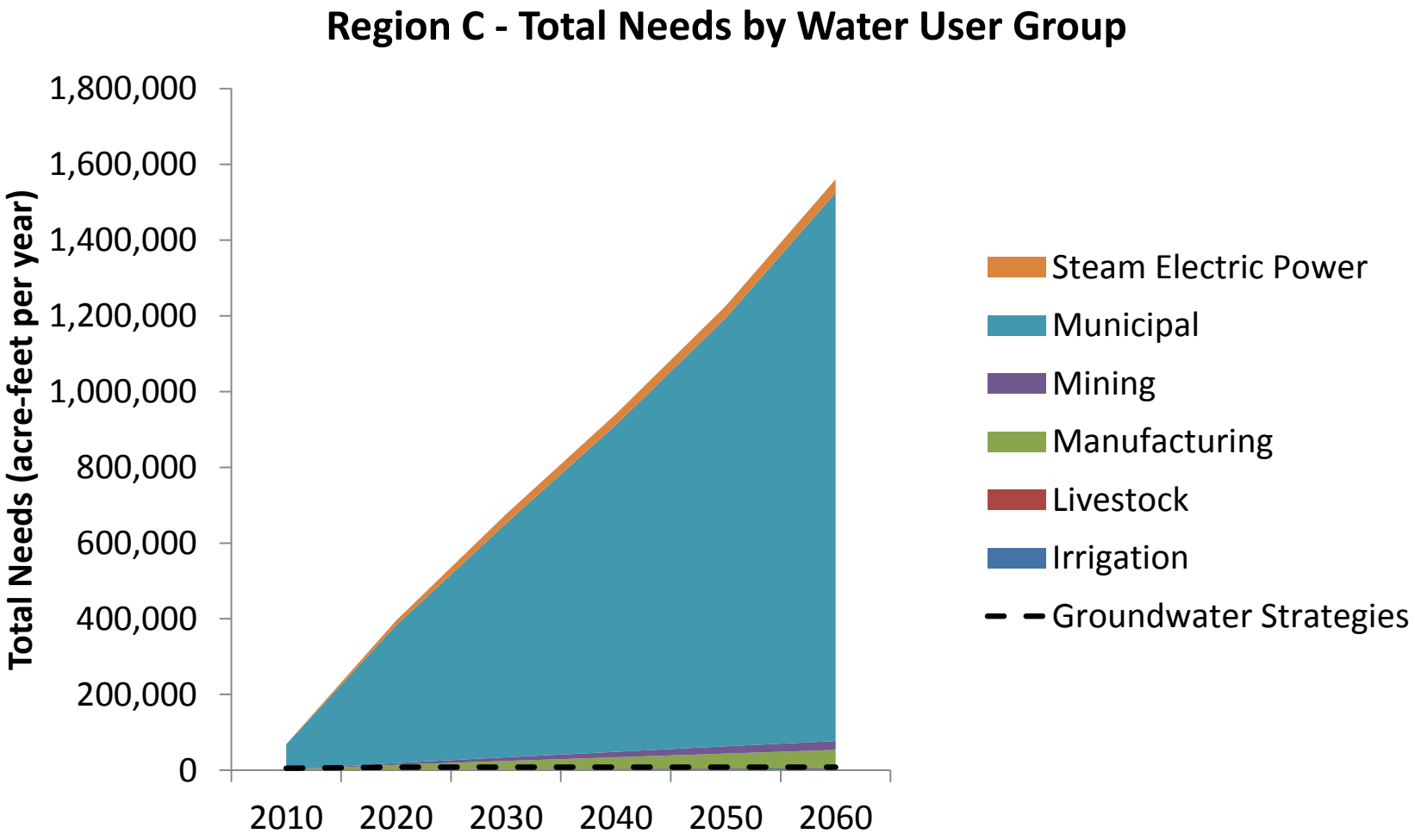
TWDB Water Planning Database

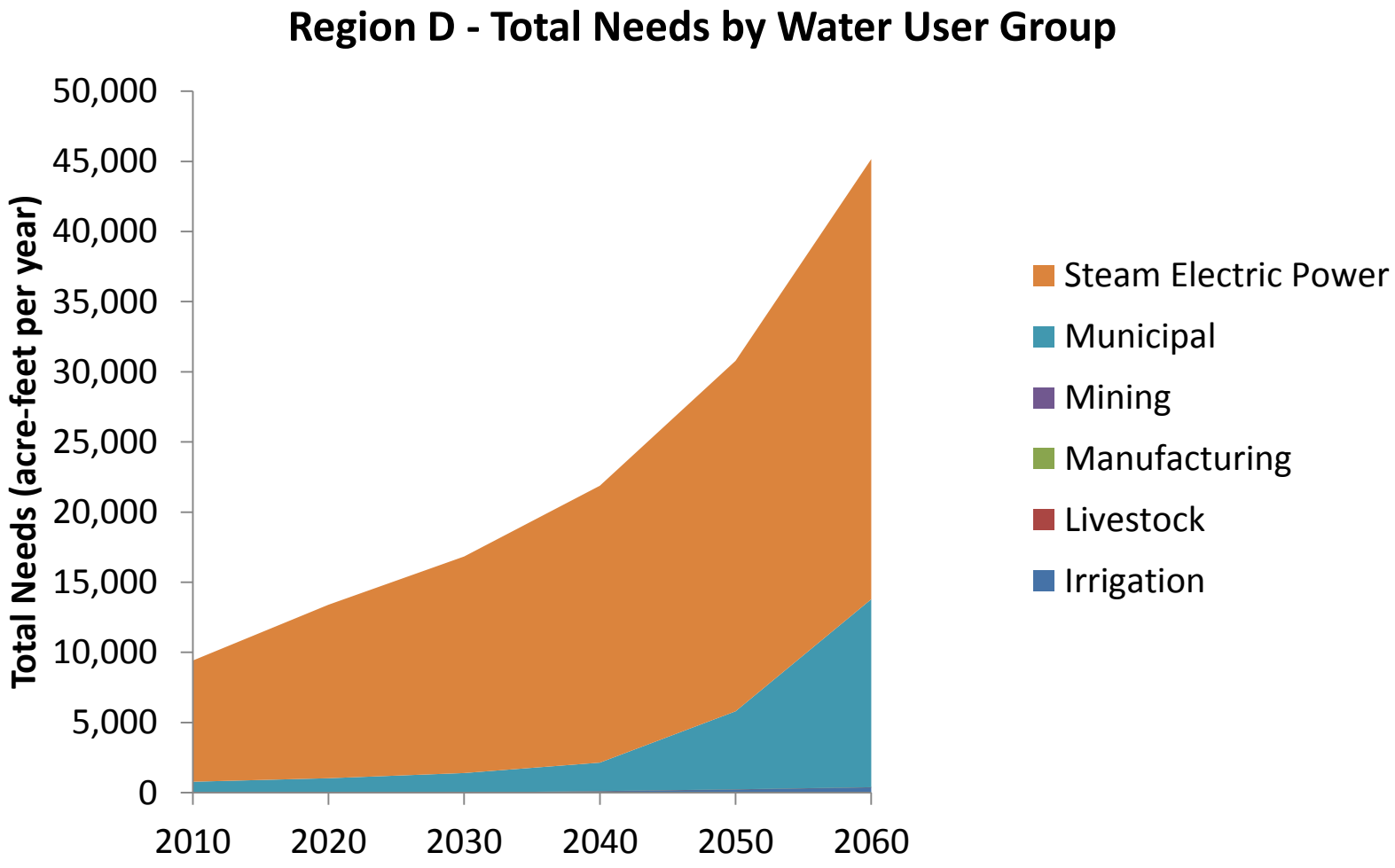
- All data presented in this presentation for consideration as required by TWC 36.108 (d)(2) are included in:
  - SWP2012_WUG_Needs_Surpluses_GMA8.pdf
  - SWP2012_WWP_Needs_Surpluses_GMA8.pdf
  - SWP2012_WUG_Strategies)GMA8_11X17.pdf
  - SWP2012_WUG_Strategies)GMA8_Letter.pdf
  - SWP2012_WUGWWP_Strategies)GMA8_11X17.pdf

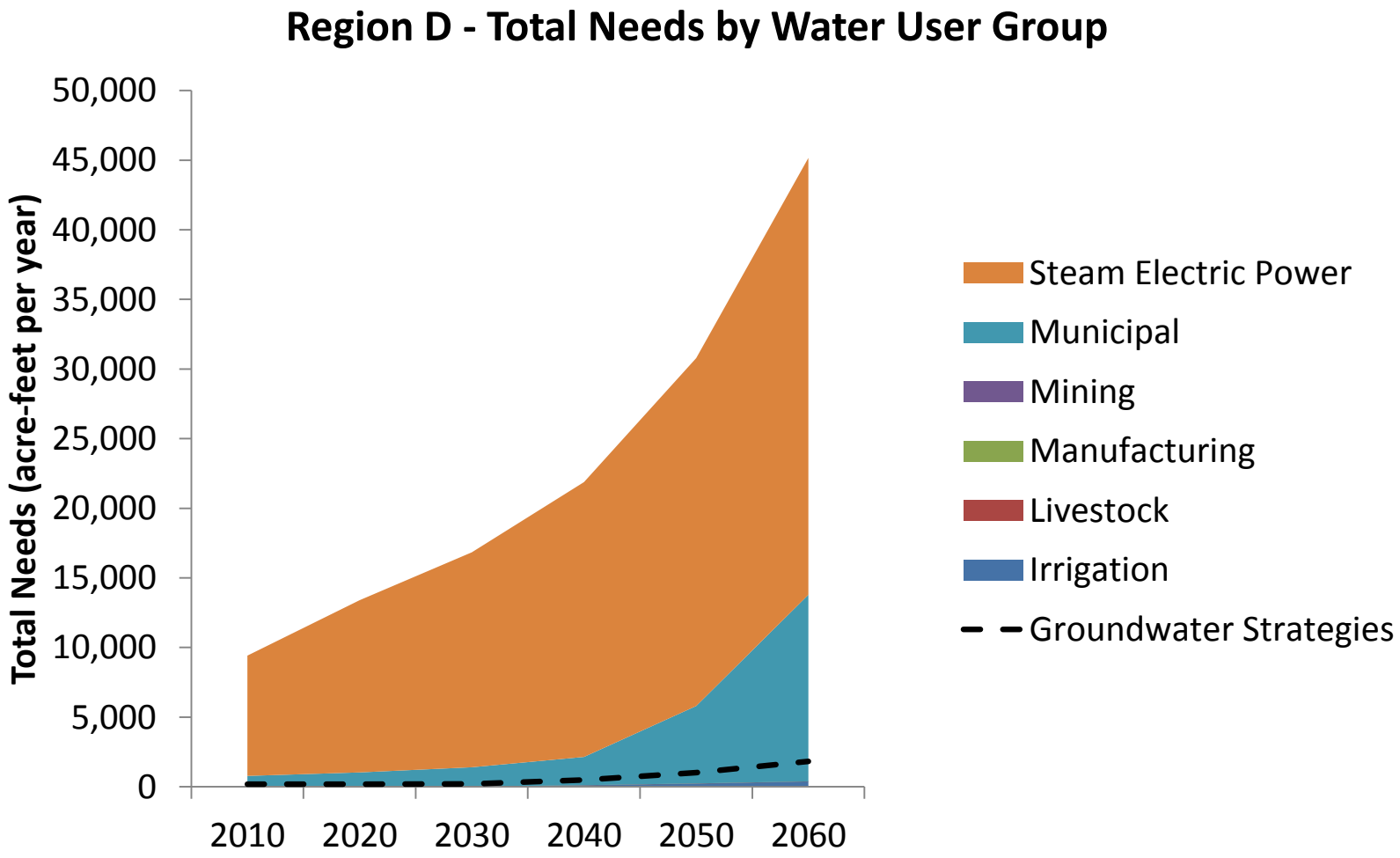

Region B - Total Needs by Water User Group
Total Needs (acre-feet per year)
500
450
400
350
300
250
200
150
100
50
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation

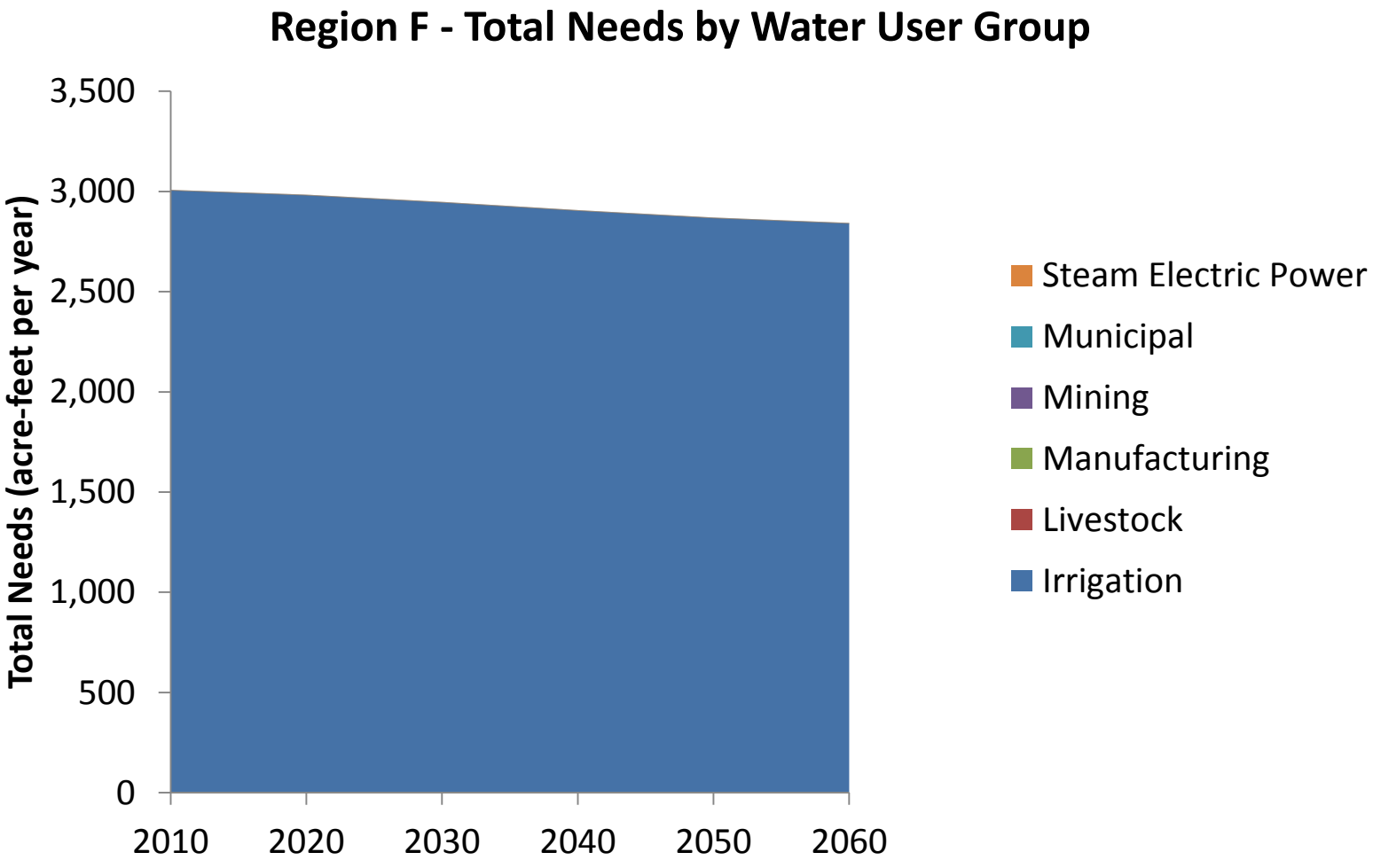

Region B - Total Needs by Water User Group
Total Needs (acre-feet per year)
1,000
900
800
700
600
500
400
300
200
100
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies

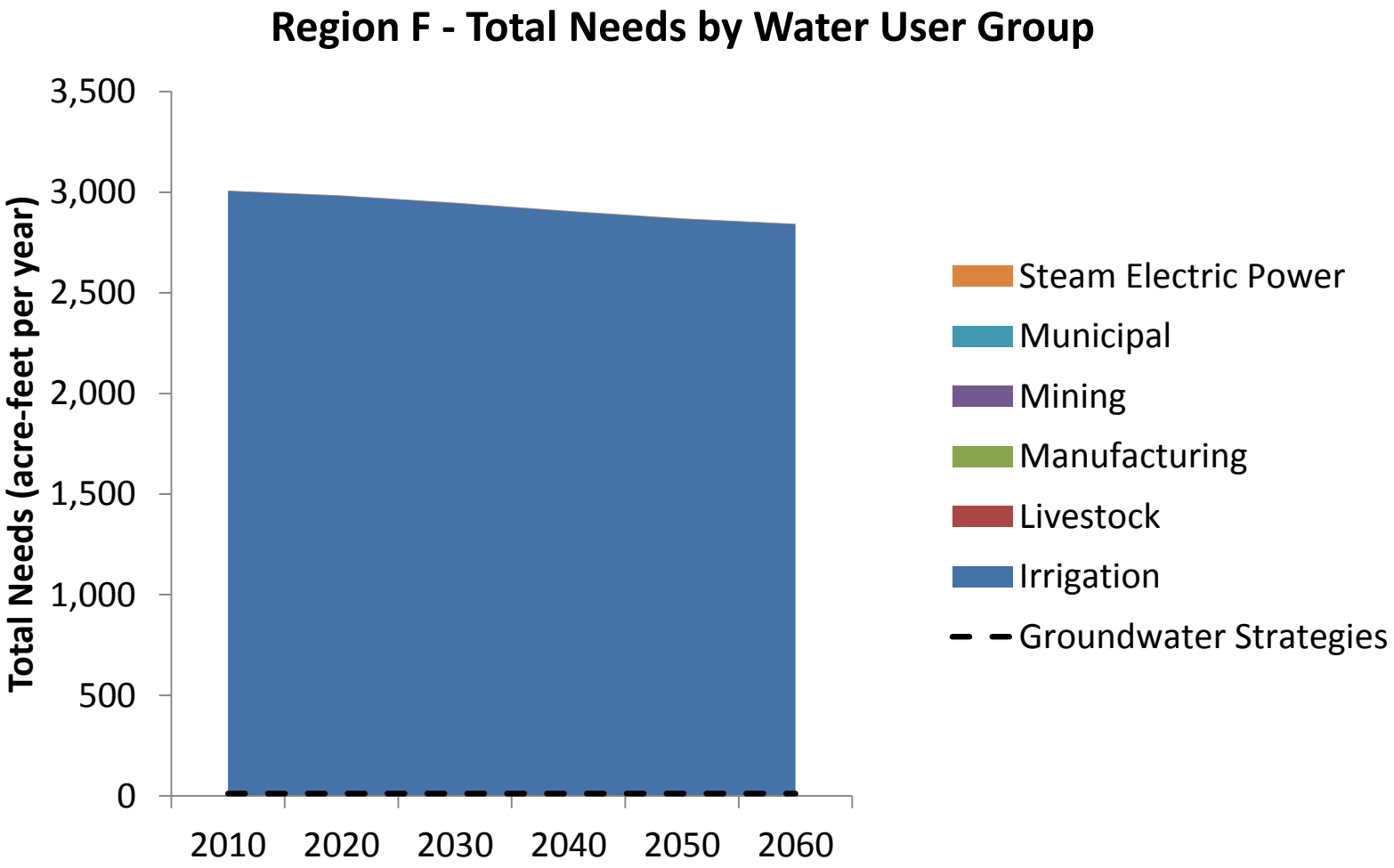

Region C - Total Needs by Water User Group
Total Needs (acre-feet per year)
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation

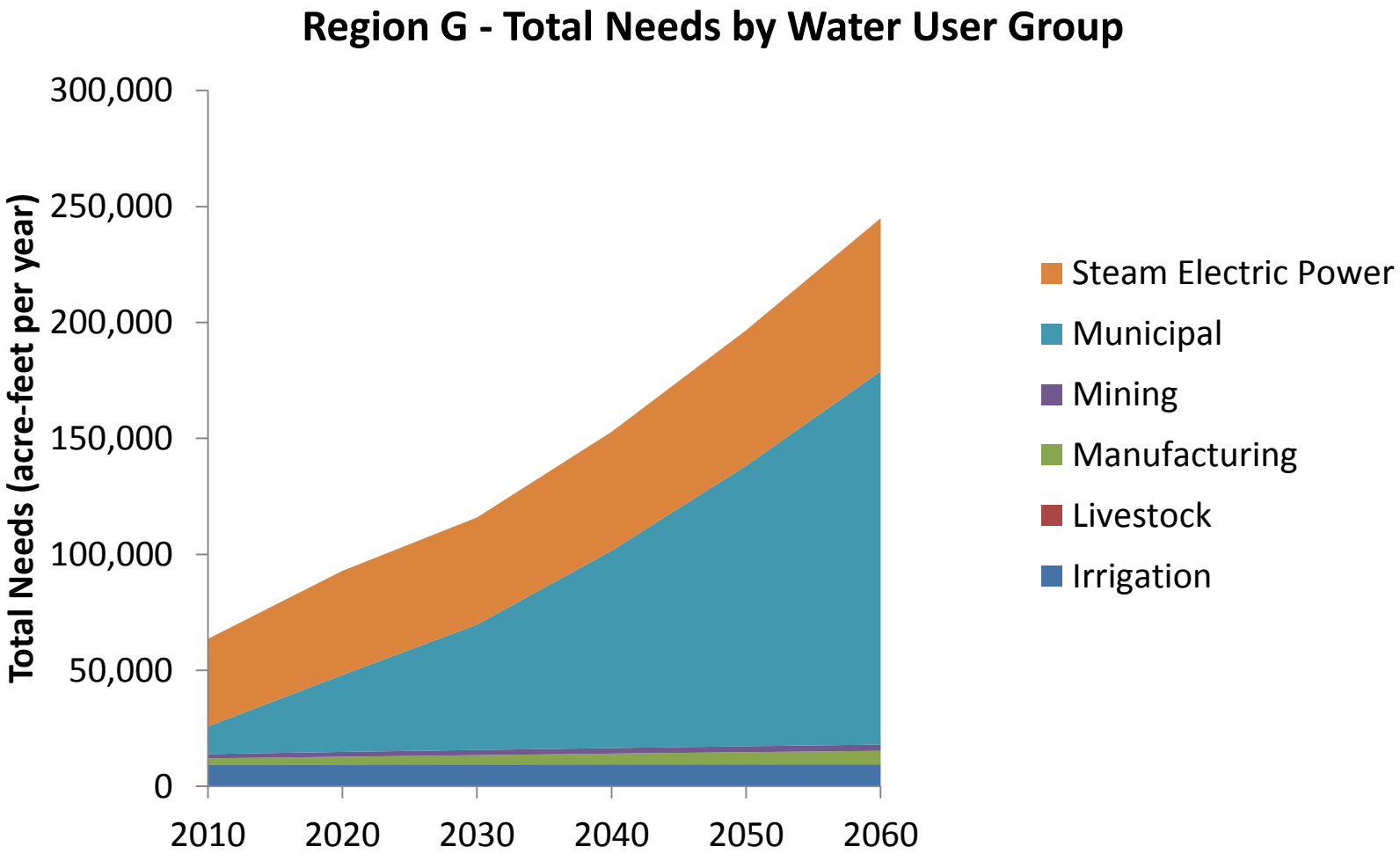

Region C - Total Needs by Water User Group
Total Needs (acre-feet per year)
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies

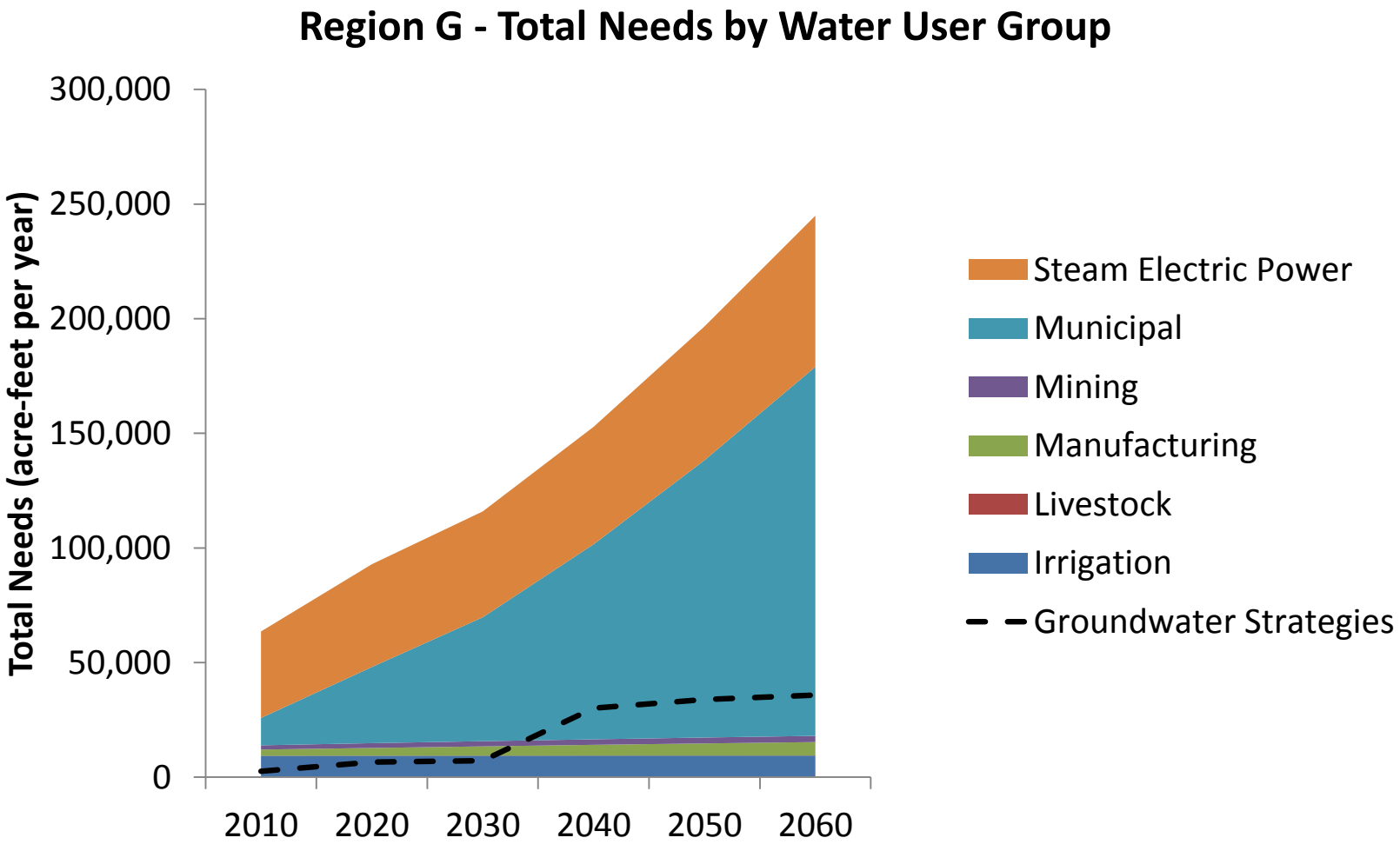

Region D - Total Needs by Water User Group
Total Needs (acre-feet per year)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation

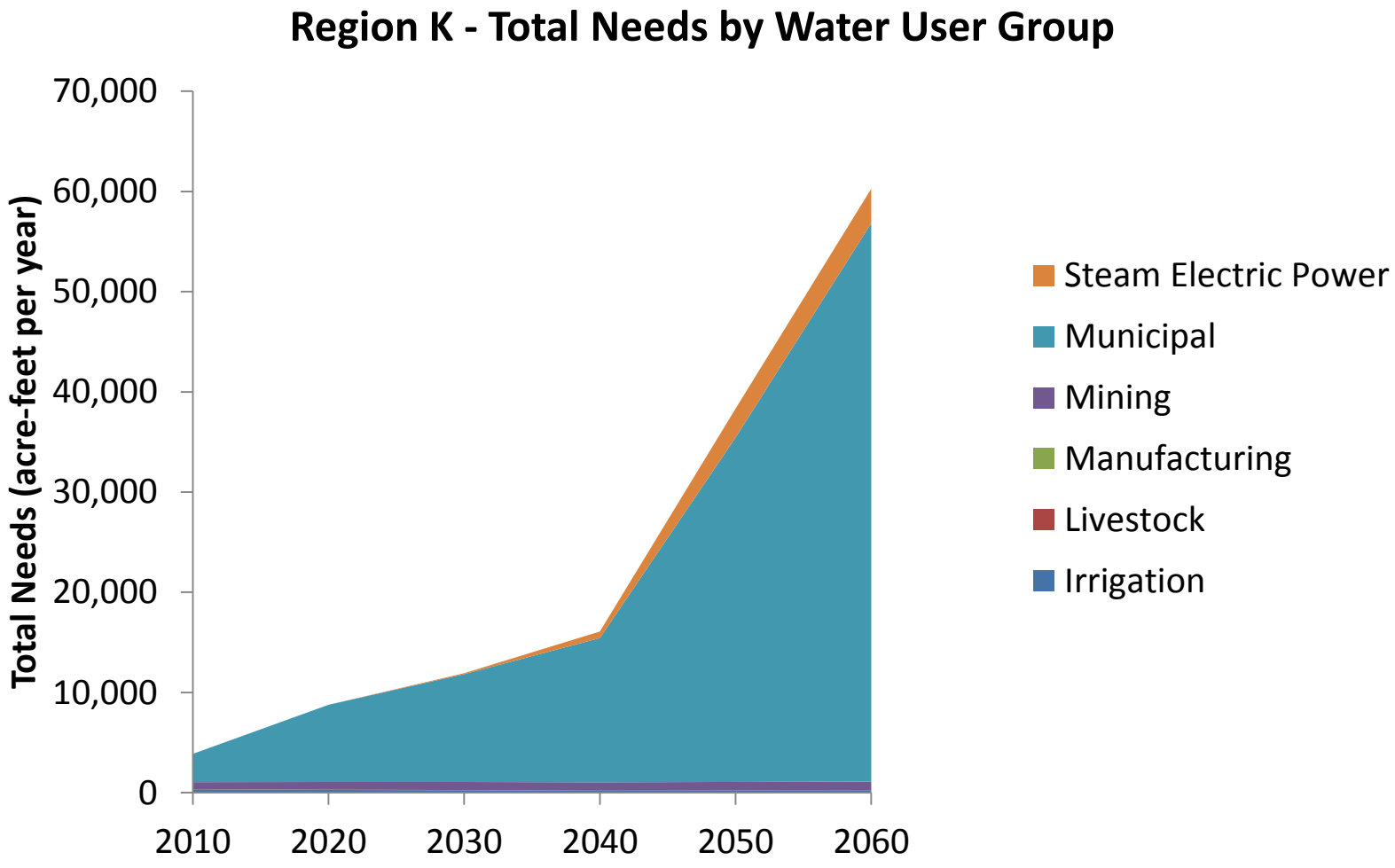

Region D - Total Needs by Water User Group
Total Needs (acre-feet per year)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies

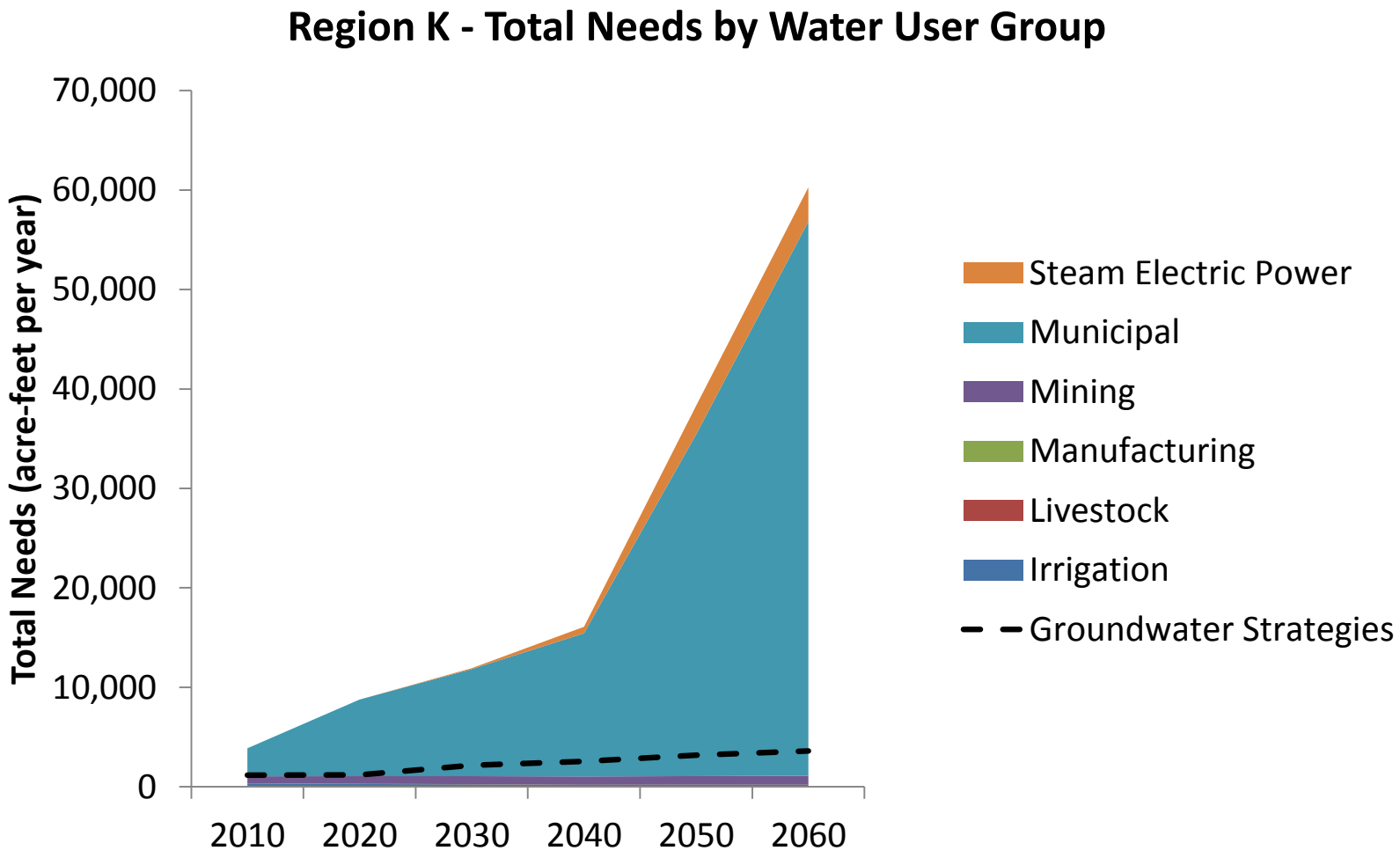

Region F - Total Needs by Water User Group
Total Needs (acre-feet per year)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation

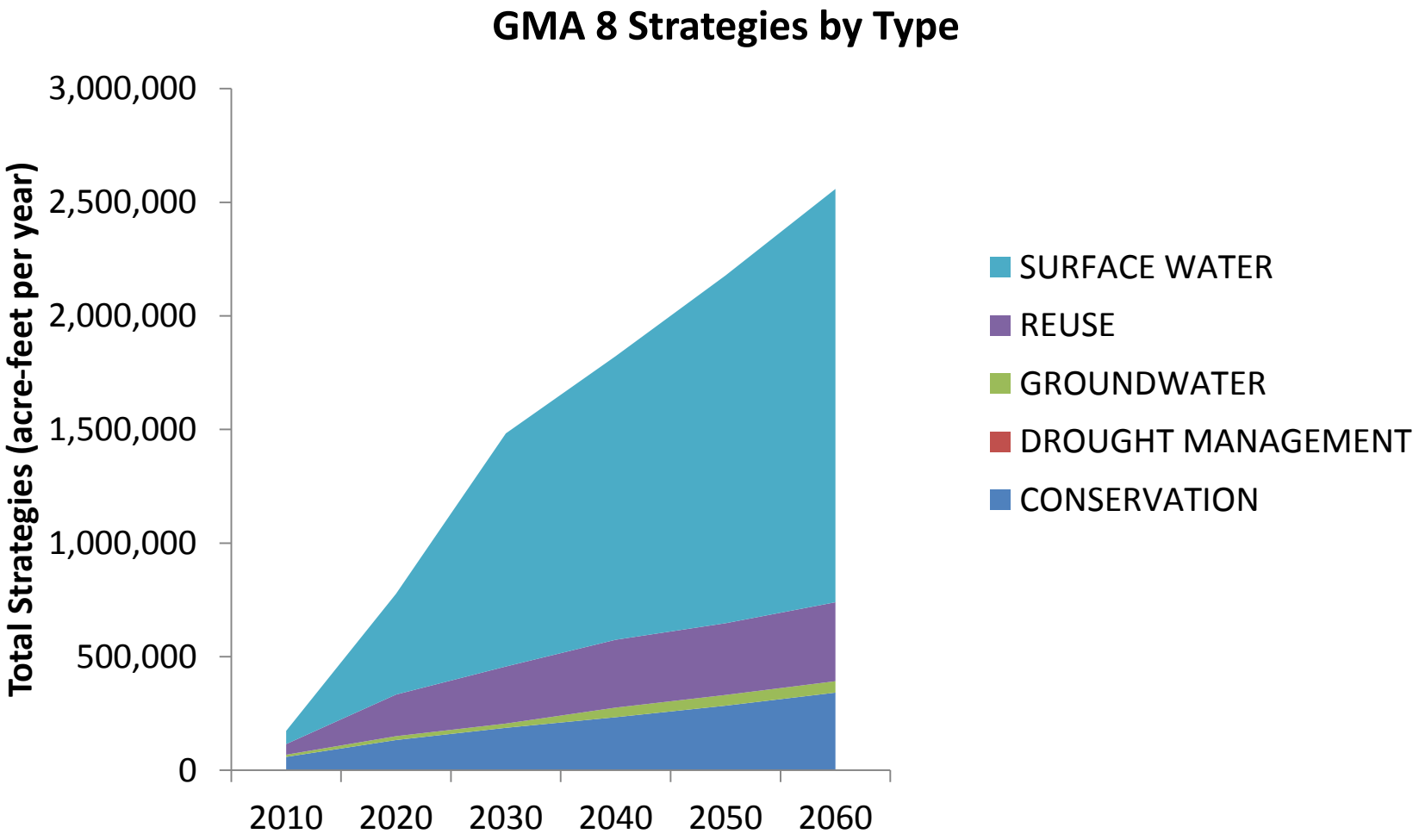

Region F - Total Needs by Water User Group
Total Needs (acre-feet per year)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies


Region G - Total Needs by Water User Group
Total Needs (acre-feet per year)
300,000
250,000
200,000
150,000
100,000
50,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation


Region G - Total Needs by Water User Group
Total Needs (acre-feet per year)
300,000
250,000
200,000
150,000
100,000
50,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies


Region K - Total Needs by Water User Group
Total Needs (acre-feet per year)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation


Region K - Total Needs by Water User Group
Total Needs (acre-feet per year)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2010
2020
2030
2040
2050
2060
Steam Electric Power
Municipal
Mining
Manufacturing
Livestock
Irrigation
Groundwater Strategies


GMA 8 Strategies by Type
Total Strategies (acre-feet per year)
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2010
2020
2030
2040
2050
2060
SURFACE WATER
REUSE
GROUNDWATER
DROUGHT MANAGEMENT
CONSERVATION

Water Supply Needs and Water Management Strategies

- After proposed DFCs are selected, will need to review information on water supply needs and water management strategies from 2012 SWP
- All detail information has been provided to GMA 8 participating GCDs
- Groundwater is a very small but locally important water management strategy to meet water supply needs

Agenda Item 10

Private Property Rights

- Texas Water Code 36.108 (d)(7) – requires that districts shall consider the impacts of proposed DFCs on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Texas Water Code Section 36.002.

For your reference, Texas Water Code Section 36.002 states:

OWNERSHIP OF GROUNDWATER

(a) The legislature recognizes that a landowner owns the groundwater below the surface of the landowner's land as real property.

(b) The groundwater ownership and rights described by this section:

(1) entitle the landowner, including a landowner's lessees, heirs, or assigns, to drill for and produce the groundwater below the surface of real property, subject to Subsection (d), without causing waste or malicious drainage of other property or negligently causing subsidence, but does not entitle a landowner, including a landowner's lessees, heirs, or assigns, to the right to capture a specific amount of groundwater below the surface of that landowner's land; and

(2) do not affect the existence of common law defenses or other defenses to liability under the rule of capture.

TWC Section 36.002 (cont.)

OWNERSHIP OF GROUNDWATER (continued)

(c) Nothing in this code shall be construed as granting the authority to deprive or divest a landowner, including a landowner's lessees, heirs, or assigns, of the groundwater ownership and rights described by this section .

(d) This section does not:

(1) prohibit a district from limiting or prohibiting the drilling of a well by a landowner for failure or inability to comply with minimum well spacing or tract size requirements adopted by the district;

(2) affect the ability of a district to regulate groundwater production as authorized under Section 36.113, 36.116, or 36.122 or otherwise under this chapter or a special law governing a district; or

(3) require that a rule adopted by a district allocate to each landowner a proportionate share of available groundwater for production from the aquifer based on the number of acres owned by the landowner.

TWC Section 36.002 (cont.)

OWNERSHIP OF GROUNDWATER (continued)

(e) This section does not affect the ability to regulate groundwater in any manner authorized under:

(1) Chapter 626, Acts of the 73rd Legislature, Regular Session, 1993, for the Edwards Aquifer Authority;

(2) Chapter 8801, Special District Local Laws Code, for the Harris-Galveston Subsidence District; and

(3) Chapter 8834, Special District Local Laws Code, for the Fort Bend Subsidence District.

Private Property Rights and TWC 36.108(d)(7)

As with the other required factors included in Texas Water Code Section (TWC) 36.108(d)(1 -9), the procedural requirements during the joint-planning process of TWC 36.108 (d)(7) are not prescribed in statute nor do TWDB rules provide and additional guidance

GCD/GMA 8 Considerations

- A suggested list of topics for each district to consider as we begin to develop DFCs, in light of the private property rights factor, includes:
  - Existing uses within the GCD
  - Projected future uses within the GCD
  - Investment-backed expectations of existing users and property owners within the GCD
  - Long-term viability of groundwater resources in the area

GCD/GMA 8 Considerations (cont.)

- Availability of water to all properties and ability to allocate MAG through rules after DFC adoption
- Whether immediate cutbacks would be required in setting a particular DFC or whether cutbacks, if any, would need to occur over a certain timeframe
- For outcrop areas, how the outcrop depletes rapidly in dry times, and whether drought rules or triggers based on the DFC/MAG for the outcrop could be beneficial to ensure viability of the resource during dry times

GCD/GMA 8 Considerations (cont.)

- Economic consequences to existing users (i.e., cost to drop pumps, reconfigure or drill new wells upon water table dropping, etc…). Also consider the reverse—economic consequences of less water available to protect the existing users from the economic consequences relevant to existing users—reaching a balance between these two dynamics
- Reviewing the sustainability run versus additional runs that provide for more pumping from aquifers, and how those two differ with respect to private property rights

GCD/GMA 8 Considerations (cont.)

- Those GCDs with existing rules developed based on the current DFC might find it helpful to review the rules that the GCD considers relevant as we work to adopt DFCs over the next 2 years. For example, the rules and Management Plan in place based on the current DFCs can help determine how a GCD currently impacts private property rights and whether those same interests are important as we work to adopt DFCs over the next 2 years
- Focusing on finding a balance, as that balance is defined by each GCD, between all of these considerations

Private Property Rights and TWC 36.108(d)(7)

This is intended to be a list for discussion as we begin the process, so each GCD should feel free to consider other items within the private property rights discussion that might be important to a particular GCD that go beyond this list. This list and other items considered relevant by a GCD are points that each GCD should keep in mind as we develop the DFCs during this round of joint planning.

Private Property Rights Homework

I will be asking each GCD to develop a written summary of how the proposed DFCs that we will be developing over the next several months impact private property rights within the GCD. I intend to incorporate some or all of the text from these summaries into the explanatory report. Of course these summaries will not be completed until we have actual DFCs that are being considered and reviewed under the 9 factors, but I wanted to frame up this discussion since I have received several questions on it already. Again, this discussion today is an initial review for purposes of framing up how we will work on this private property rights factor going forward.

Questions