



# Assigning Available GW Supplies when Supply Exceeds Demands

GW Subcommittee Agenda Item 6.2

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## Overview

- Methodology for allocating Modeled Available Groundwater supplies to users
- Situation to address: A WUG's GW supply exceeds demands. How to allocate the "excess" supply?



## Process for Allocating MAG Supplies to WUGs and WWPs

- Available groundwater supplies
  - Modeled Available Groundwater (MAG) when available
    - Divided by Aquifer – County – River Basin
  - Utilize estimates from 2016 Plan when no MAG available
    - Minor, local aquifers
    - Aquifers for which no MAG was determined
- Allocation of MAG to WUGs and WWPs
  - Within each county/basin, allocate MAG to Municipal WUGs/WWPs based on installed well capacity
    - $\text{WUG/WWP Supply} = \text{rated capacity} * 0.5 \text{ (2.0 peaking factor)} * 0.95 \text{ (assumes 5\% downtime for maintenance)}$
    - County-Other Supply = 125 percent of 2010 use
  - Non-Muni WUGs
    - Steam-Electric and Manufacturing Supply = 130 percent of 2010 use
    - Irrigation, Mining & Livestock Supplies = projected demands
  - Supply is pro-rated down for all users if MAG would be exceeded
  - Trinity Aquifer constrained supply due to DFCs (large water level declines)
  - 2010 use assumptions will be re-evaluated to most reasonable estimate (2016?)



## What if a WUG/WWP supply greatly exceeds demands?

- Groundwater is viewed largely as a “common resource” – users affect each other
- How to use the MAG that remains after the demands from **current users** are met?
  - Supply could be available for use by recommended water management strategies
  - Overall planning supply can be increased if supplies are reallocated differently
    - Current approach for allocating groundwater supplies:
      - » Allocating based on installed well capacity controls that portion of water, regardless of actual demands
      - » Allocated supply can greatly exceed demands for some WUGs and WWPs
      - » This “unused” supply is not made available for new groundwater supply strategies
    - Alternative approach:
      - » Assume some portion of “unused” supply is available under the MAG
      - » Allocate some of the surplus supply back to the “common resource” for use by recommended water management strategies
      - » Appropriate demand factor? – WUG/WWP retains 15%, 25%, 50%? greater than demands



## Approaches Used by Other Regions

- There is no single approach used by all the regions
- TWDB has not compiled a list of approaches
- Reviewed 15 regional water plans – in most, it was not possible to determine from the text of the plan (Chapter 3 or Chapter 4)
  - Region L: “For cities using groundwater, supply is based on reported well capacities with adjustments to account for a peak to average day water demand ratio of 2:1. In cases in which the total demand on that portion (i.e., county and river basin) of the aquifer exceeds the total availability, supply is prorated downwards for every entity using that particular source.”
  - Region H: For counties with adequate groundwater supplies not in a subsidence district: “Groundwater from the appropriate source formation was allocated to each WUG in an amount not to exceed the lesser of the projected demand for each decade and the estimated groundwater production capacity.”
  - Region N: “For cities, groundwater supply was based upon projected water use or well capacity reported to TCEQ, whichever is less.”



## “Unused” Groundwater Supplies

- Example: Texas A&M University (2016 Plan data)
  - Year 2030 supply: 13,869 acft/yr based on well capacities and MAGs
  - Year 2030 demand: 6,349 acft/yr
  - Unused supply: 7,520 acft/yr
  - Some or all of the unused supply could be made available to new water management strategies
- Example: Brazos County (Carrizo-Wilcox, Queen City and Sparta Aquifers)

**2030 Analysis**

MAG = 52,789 acft/yr (Carrizo-Wilcox, Queen City, Sparta)

WUG	2030 GW Demands (acft/yr)	GW Supply Capacity (acft/yr)	2030 Assigned Supply under Existing Method (acft/yr)	2030 Supply w/Excess Capacity Removed (125% Buffer)
BRYAN	17,356	20,257	19,384	19,384
COLLEGE STATION	20,480	14,753	14,116	14,116
TEXAS A & M UNIVERSITY	6,349	13,869	13,347	7,936
WELLBORN SUD	3,592	1,065	1,017	1,017
WICKSON CREEK SUD	1,277	2,050	2,030	1,596
BRAZOS COUNTY-OTHER	392	1,028	1,022	490
BRAZOS COUNTY-SE	336	177	169	169
<b>Total</b>	<b>49,782</b>	<b>53,199</b>	<b>51,086</b>	<b>44,709</b>

Excess MAG (2016 Method): 1,703 acft/yr

Excess MAG (125% buffer): 8,080 acft/yr

Increase: 6,377 acft/yr



## “Unused” Groundwater Supplies

- Example: Brazos County (Carrizo-Wilcox, Queen City and Sparta Aquifers)

Remaining MAG Available for Reallocation

### 2016 Method

<u>Aquifer</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>	<u>2070</u>
CARRIZO	-	-	2,461	7,010	10,209	10,209
QUEEN CITY	204	234	187	133	129	129
SPARTA	102	1,469	1,466	1,468	1,468	1,468

### Revised Method

<u>Aquifer</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>	<u>2070</u>
CARRIZO	3,359	4,649	7,597	12,114	15,310	15,310
QUEEN CITY	409	442	397	345	342	342
SPARTA	1,562	2,989	2,914	2,738	2,711	2,711



## Question for Discussion and Recommendation

1. Can we reduce groundwater supplies to WUGs that don't utilize entire supply, and make the unused supply available as general groundwater available under the MAG for water management strategies?

#### Pros

- Makes fuller use of GW resources
- Doesn't limit available supplies based on unused well capacity
- Closer to how GW supplies are managed
- Eliminates some expensive water management strategies

#### Cons

- Removes one level of conservatism in the planning
- Doesn't consider capital investment made in supply capacities
- Doesn't consider that future growth might actually utilize the "unused" supply

2. If so, what portion of the unused supply should remain with the WUG?
  - Suggest limiting GW supply to 125% of GW demand
3. If unused supply reallocated, how should reallocated supply be assigned?
  - Suggest bring existing users up to lesser of 125% GW demand or existing supply capacity
  - Make remainder available to new strategies

