



**ARAPAHOE COUNTY**  
PUBLIC WORKS & DEVELOPMENT

**ARAPAHOE COUNTY  
WATER SUPPLY  
STUDY**

I-70 Corridor REAP  
April 13, 2023





## Overview

Project Team

Study Overview

Key Deliverables / Outcomes

Outreach and Engagement

The Big Picture

Arapahoe County Water Supplies



# County Staff and Consulting Team



Larry Mugler, Planner/Project Specialist, Arapahoe County



Lorretta Daniel, Long Range Planning Program Manager, Arapahoe County



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Will Koger



Mike Waresak



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Bill Fronczak



Mary Presecan



Anne Kuechenmeister



Ted Heyd



Laura Weinstein



Craig Dossey



## Study Overview

Plan for current and future water needs.

- Assess water supplies and demands up to the year 2050.
- Identify potential shortages.
- Identify how the county can use water more efficiently in the years ahead.
- Engage residents to better understand needs and concerns.
- Complete a study seeking to balance demands with supplies.





## Tasks & Deliverables

- Land Use and Socioeconomic Scenario Development
- Groundwater Analysis
- Review of Water Conscious Landscaping Standards
- Assessment of Water Conservation Plans on Future Water Demand
- Demand and Supply Analysis
- Water Reuse Analysis
- Recommendations for Regulatory Modifications
- Plan Update and Implementation
- Water Supply Study

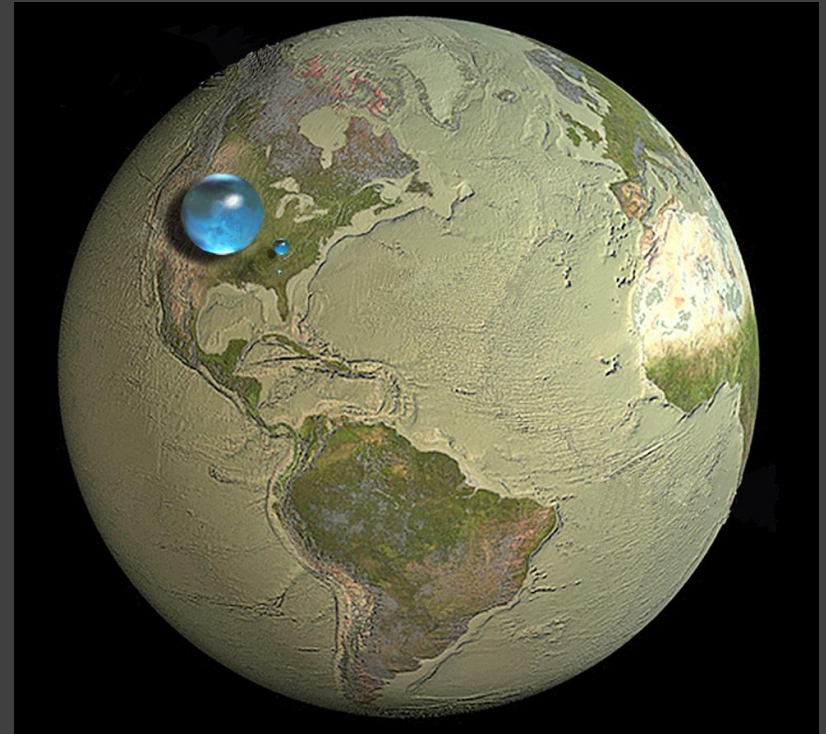
# Outreach and Engagement

- Advisory Committee Meetings
- Project Announcement Flyer
- Project Web Page
- MetroQuest (Community Interactive Online Engagement)
- Two Public Meetings
- Notifications and Updates Via Social Media and Other Outlets

# *The Big Picture*

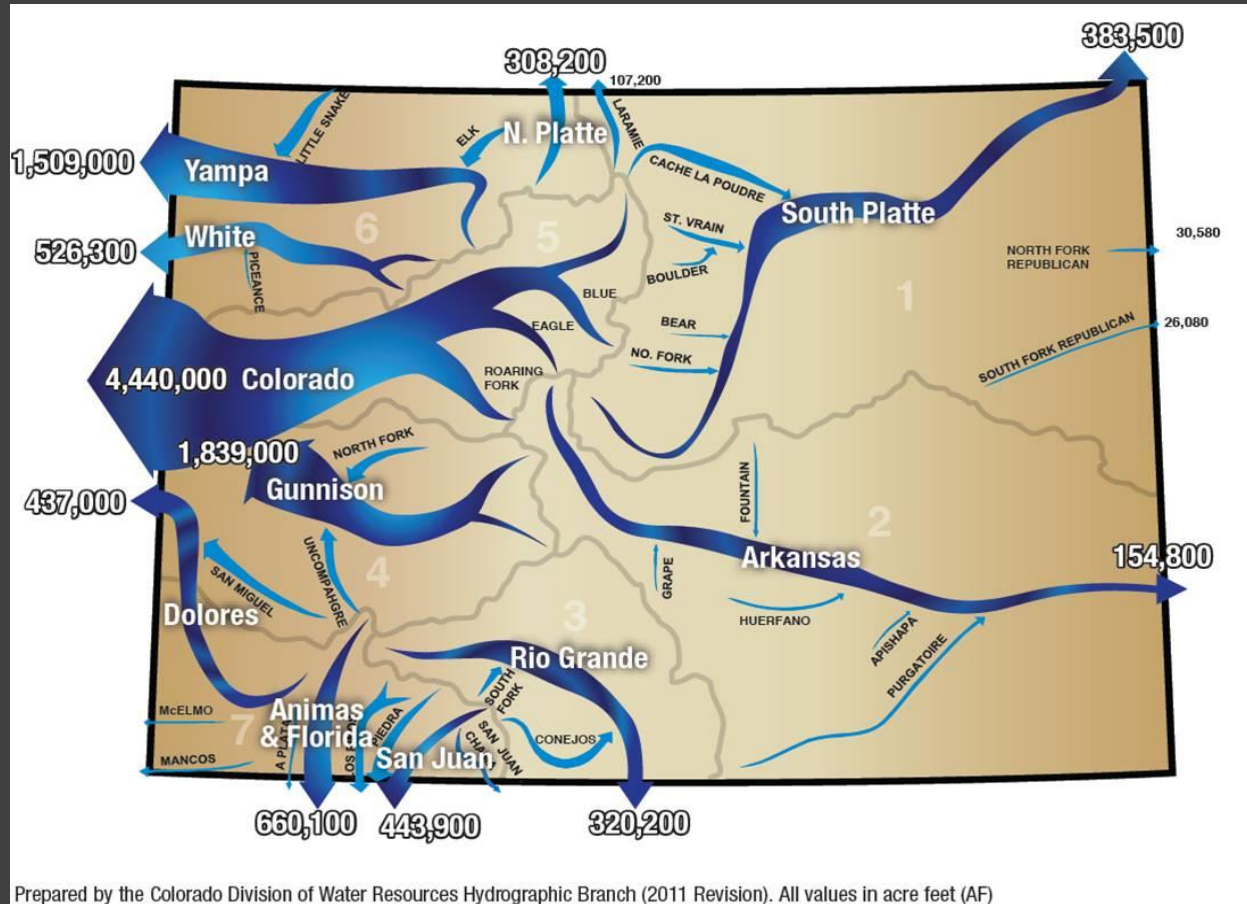
## How Much Water is There?

- 💧 All Earth's water: fits in a 700-mile box
- 💧 3% is fresh water, but >80% of that is in ice caps
- 💧 <1% of fresh water is in lakes, rivers
- 💧 Remainder is groundwater



# Colorado's Divide

- 80% population on Front Range
- 80% water on West Slope





# Growing Water Demands

|                 | 2020    | 2050              |
|-----------------|---------|-------------------|
| Colorado        | 5.8 M   | 7.5 M             |
| Arapahoe County | 655,000 | 900,000 - 960,000 |



# Arapahoe County Water Supplies

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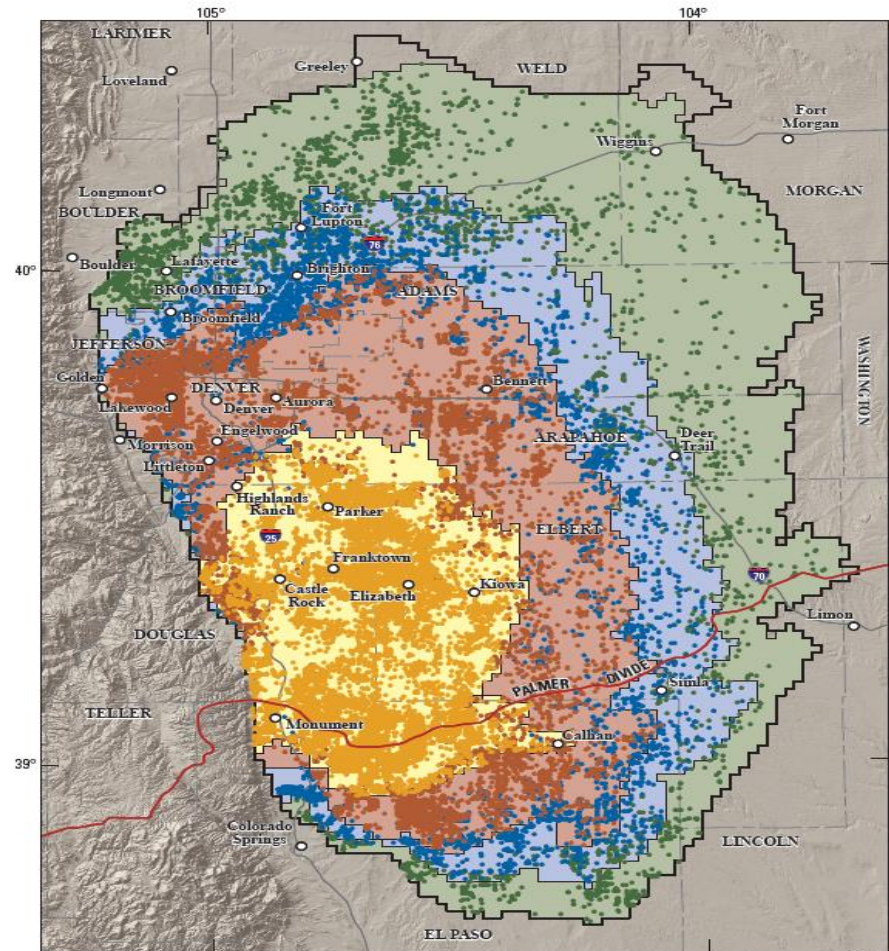
Surface  
Waters

- Prone to Drought
- Transmountain Diversions
- Approx. 50% from West Slope

Denver Basin  
Groundwater

Drought-proof but  
Diminishing

# Denver Basin - Wells



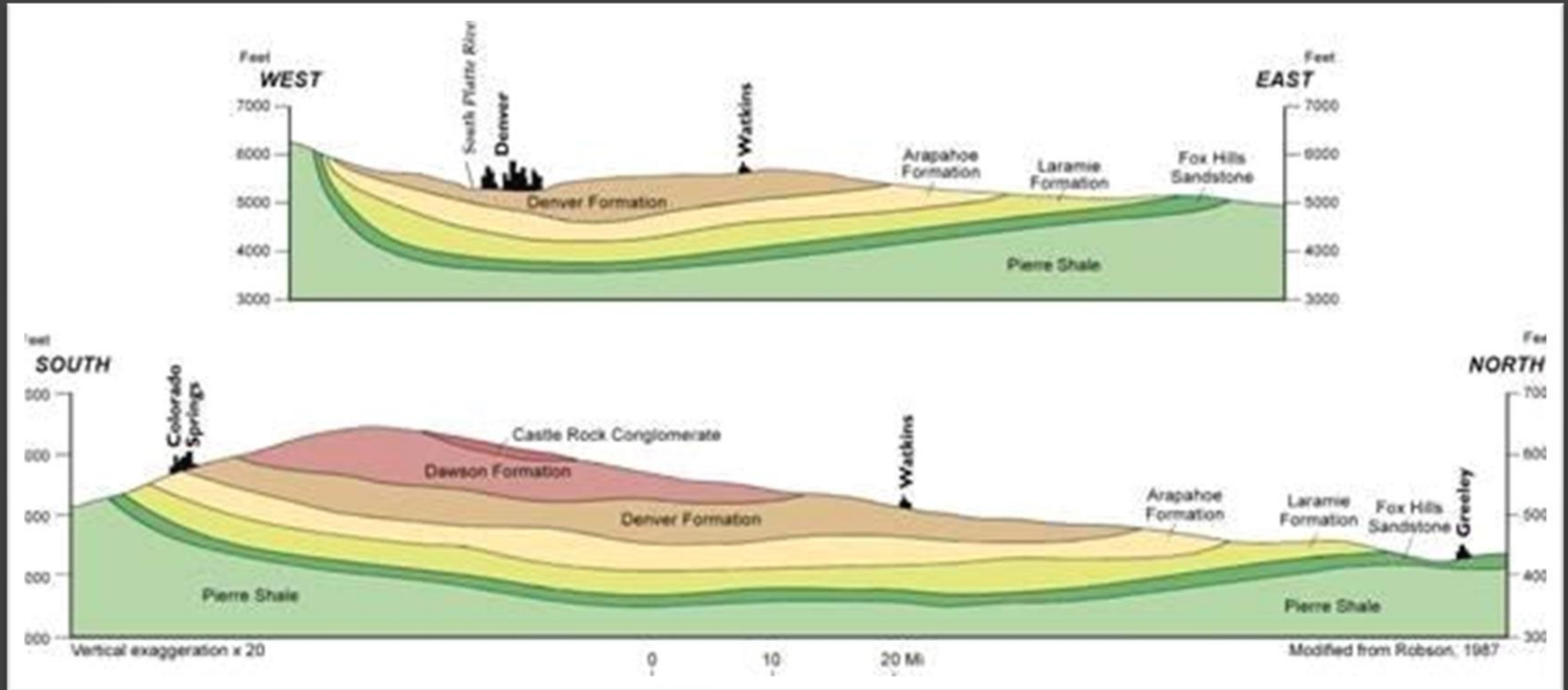
Base from U.S. Geological Survey digital data, 2009, 1:100,000  
 Lambert Conformal Conic projection (Colorado State Plane Central)  
 Standard parallels 38°27'N and 37°45'N, central meridian 105°00'W

0 10 20 MILES  
 0 10 20 KILOMETERS

- EXPLANATION**
- Lower Dawson aquifer simulated extent (model layer 4)
  - Denver aquifer simulated extent (model layer 6)
  - Lower Arapahoe aquifer simulated extent (model layer 10)
  - Laramie-Fox Hills aquifer simulated extent (model layer 12)
  - Extent of active model cells
  - Upper or lower Dawson aquifer domestic well
  - Denver aquifer domestic well
  - Upper or lower Arapahoe aquifer domestic well
  - Laramie-Fox Hills aquifer domestic well

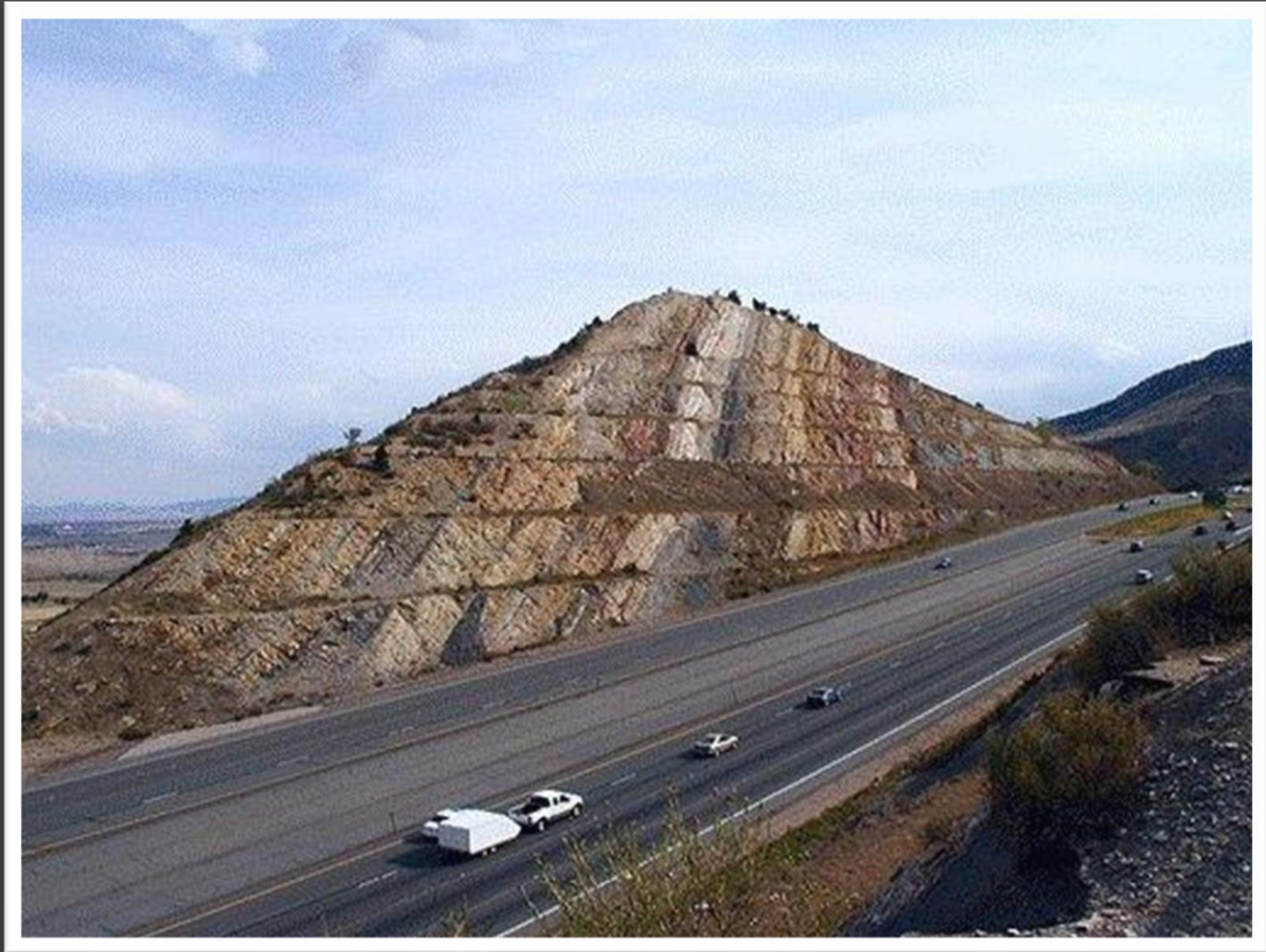
**Figure B13.** Locations of Denver Basin bedrock domestic wells categorized by aquifer, 2003.

# Denver Basin



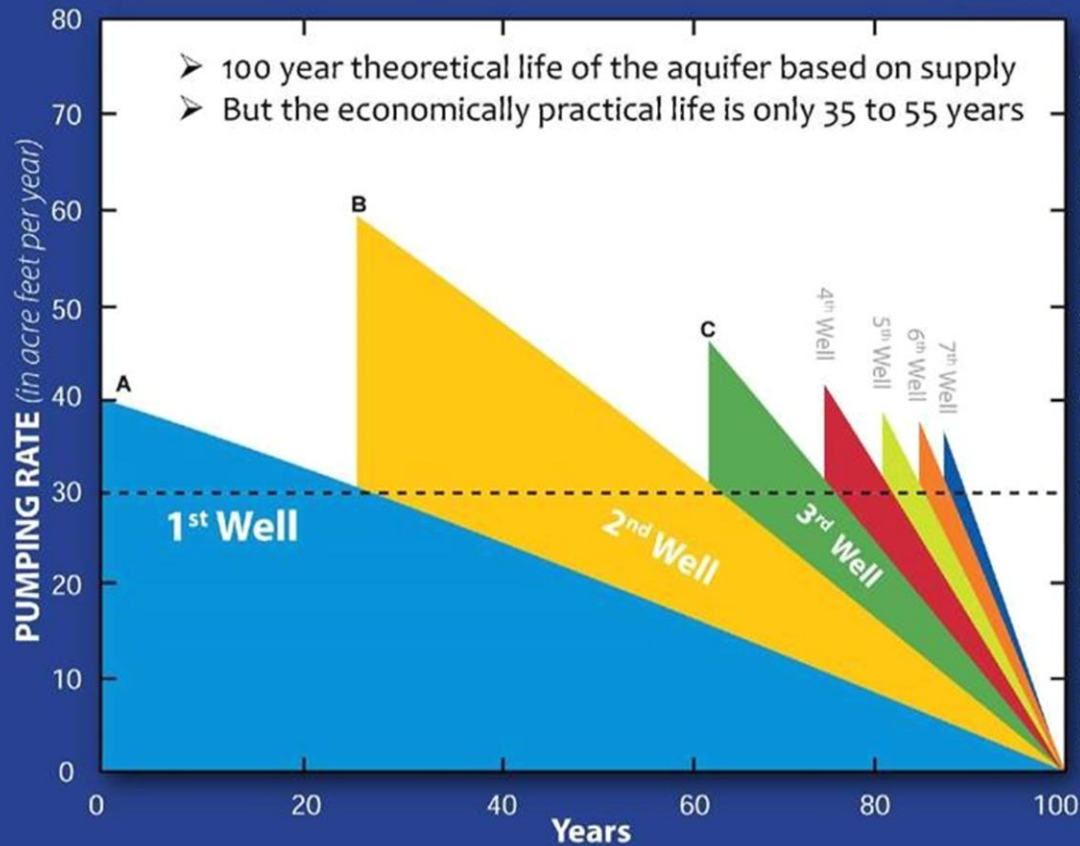
# Denver Basin

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# Denver Basin – Well Declines

## CASCADING REDUCTION IN WELL YIELD

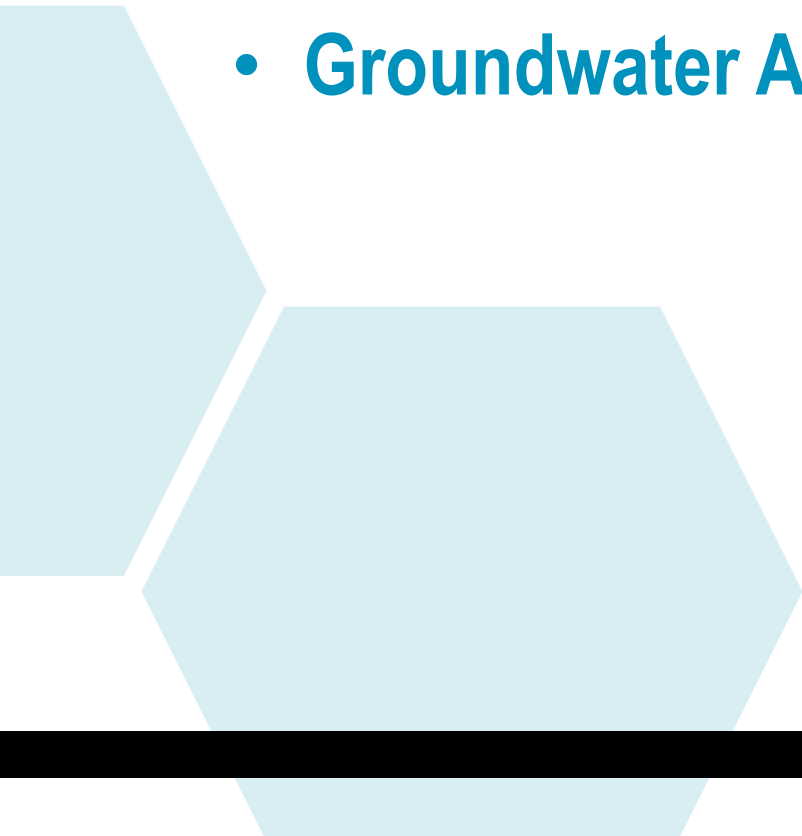


As more wells are drilled in an area, their yield decreases thereby increasing the costs of each unit of water produced: i.e. The Law of Diminishing Returns

Developing Denver Basin Water Rights has a Diminishing Water Return Over Time

# Clinton Meyer, PG

- **Mapping and Data Development**
- **Groundwater Aquifers**



# MAPPING AND DATA DEVELOPMENT

- [Preliminary Demo of Arapahoe County Study Web Map](#)

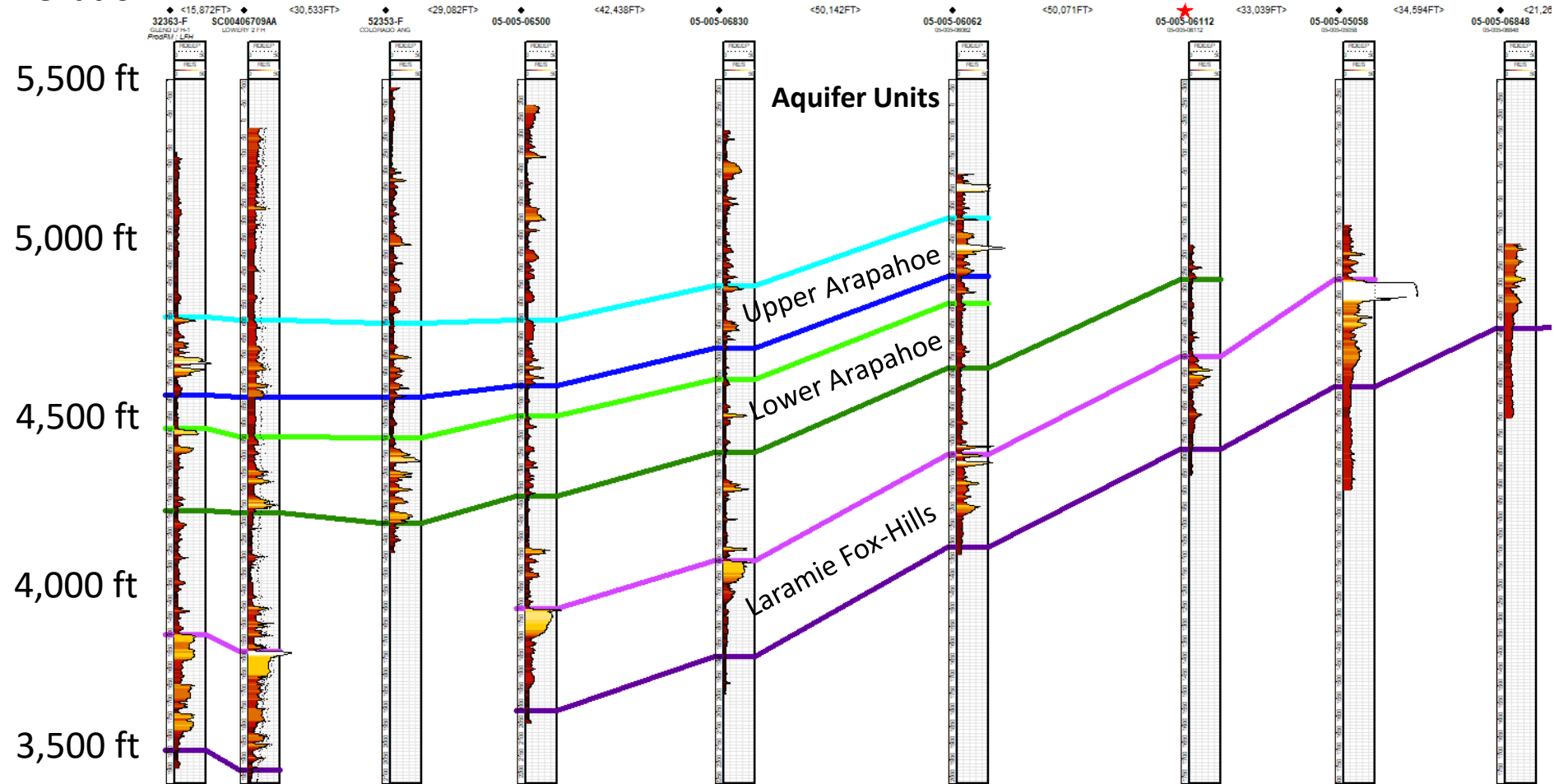


# DENVER BASIN GROUNDWATER STRUCTURAL MAPPING

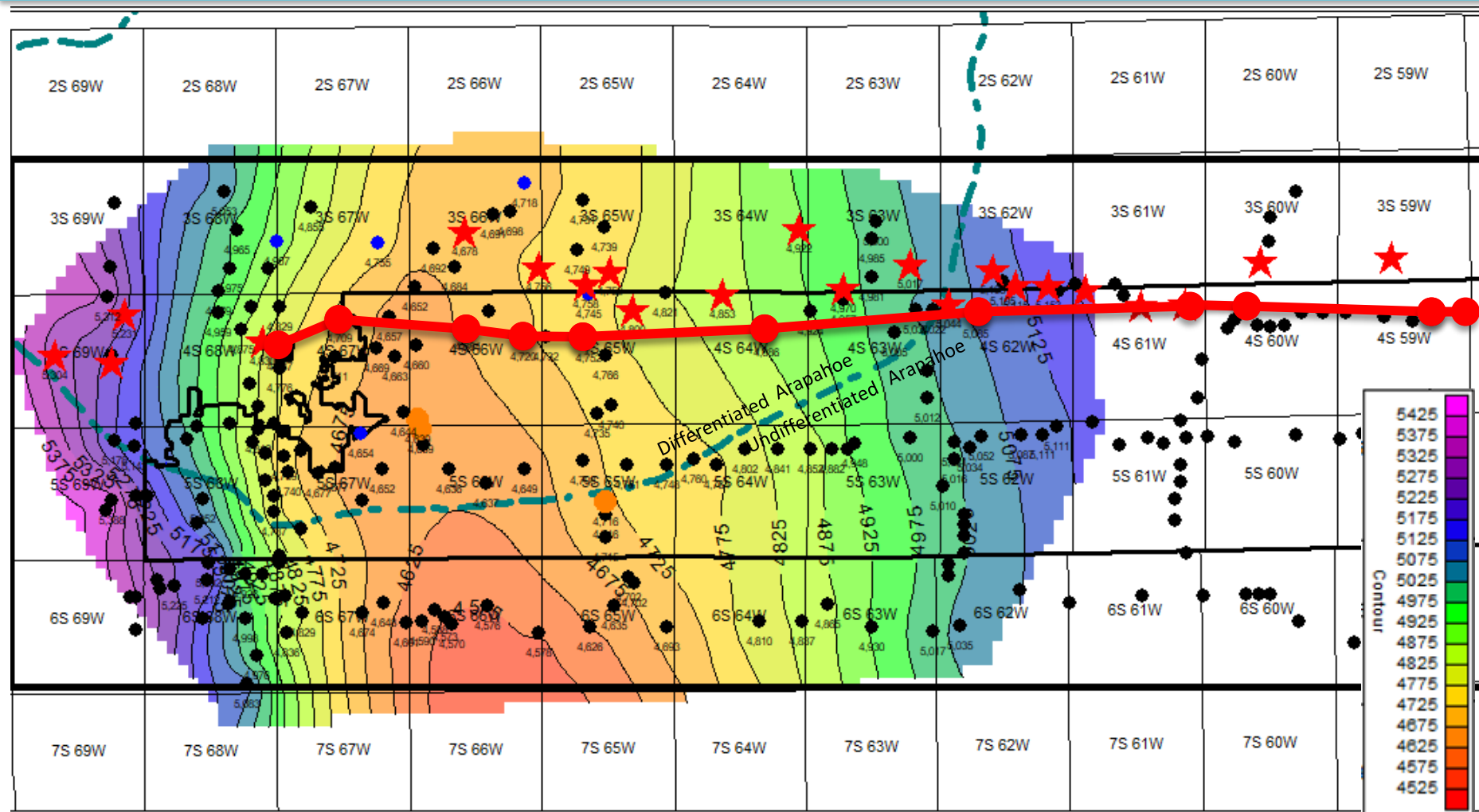
- Identify differences between what the state says is available (under SB-5) and what is physically available
- Elevation contours for top and bottom of each aquifer
- Net sand volumes (aquifer material)

# STRUCTURAL MAPPING METHODOLOGY

Elevation



# STRUCTURAL MAPPING: UPPER ARAPAHOE AQUIFER





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# Water Supply Challenges



# Opportunities for Regional Cooperation



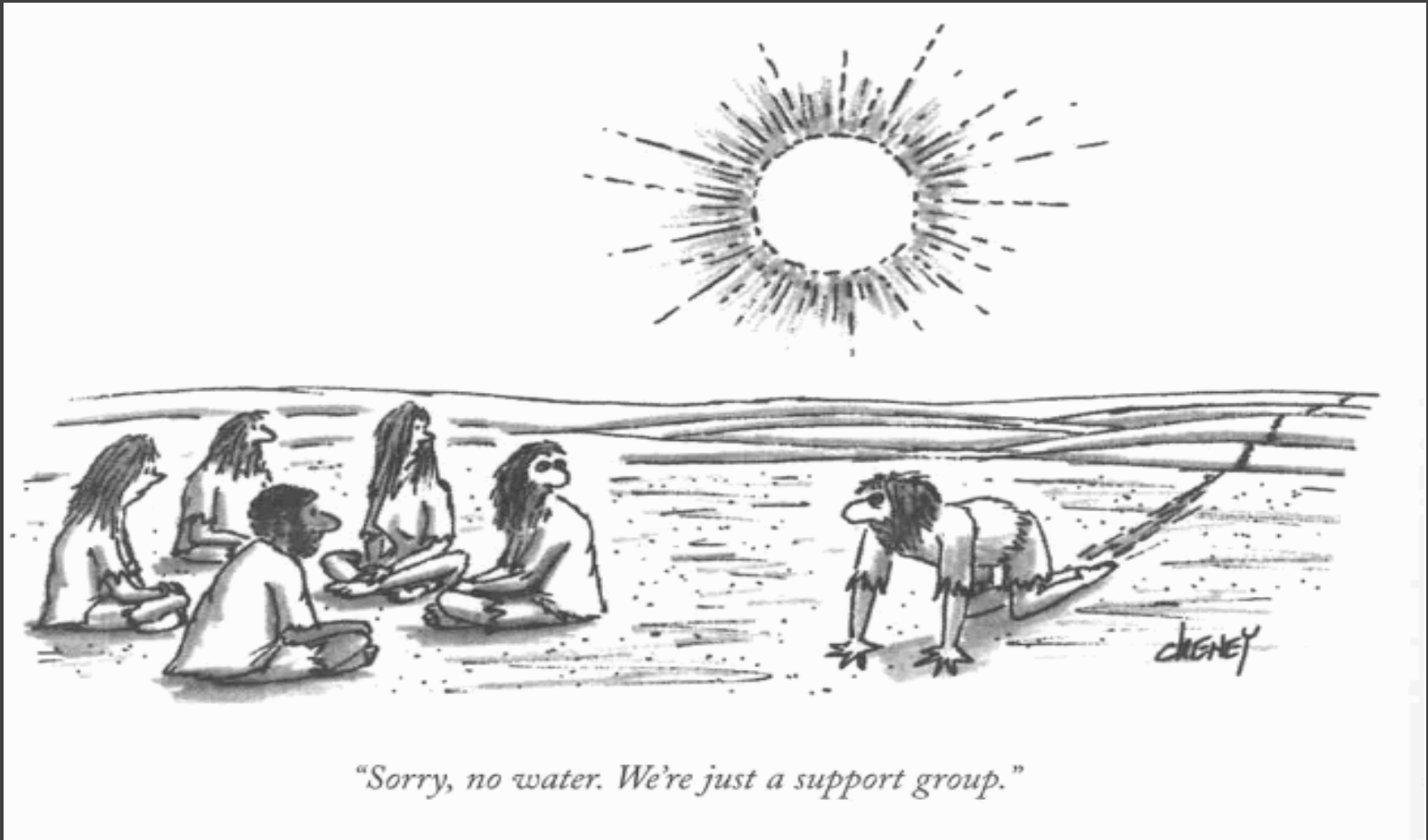
## Discussion: Questions and thoughts?

What is the one thing that you want the project team to know about the county's future water supply before you leave today?





# Questions/Discussion





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# Thank You

**Project Website:**

**[Arapahoegov.com/waterstudy](http://Arapahoegov.com/waterstudy)**