

# Well Permitting and Adjudication of Nontributary Ground Water

*Greenland Ranch  
Case No. 94W038*

# The Numbers Greenland Ranch

<b>Number of Acres<sup>1</sup></b>	<b>21,007</b>	
	<b>Allowed by Decree</b>	<b>Permitted (July 25, 2017)</b>
<b>Annual Amount of Water (acre-feet)</b>		
<b>Lower Dawson Aquifer</b>	<b>1,033</b>	<b>0</b>
<b>Denver Aquifer</b>	<b>16,873</b>	<b>581</b>
<b>Arapahoe Aquifer</b>	<b>14,565</b>	<b>1,048</b>
<b>Laramie Fox Hills Aquifer</b>	<b>6,318</b>	<b>0</b>

1. Approximately 33 square miles

# Three Important Points

- Tributary vs. Nontributary
- Senate Bill 213, Landowner's Rights
- Senate Bill 5, Denver Basin Rules

# Ground Water Today

Legal/administrative perspective: two types of ground water

- Tributary
- Nontributary

# Brief History of Ground Water Administration

## 1900's through 1960's

- Well pumping was allowed (all types of ground water)
- Increasing attention to impacts to surface water
  - What impacts?
  - Most ground water is connected to surface streams
  - Pumping the ground water depletes those streams.
- **What about nontributary ground water?**
  - Recognition that some formations were “not tributary to any stream” (was not called “nontributary” yet)
  - This ground water pumping had little or no impact
  - Qualitative understanding

# Focus on Nontributary Ground Water

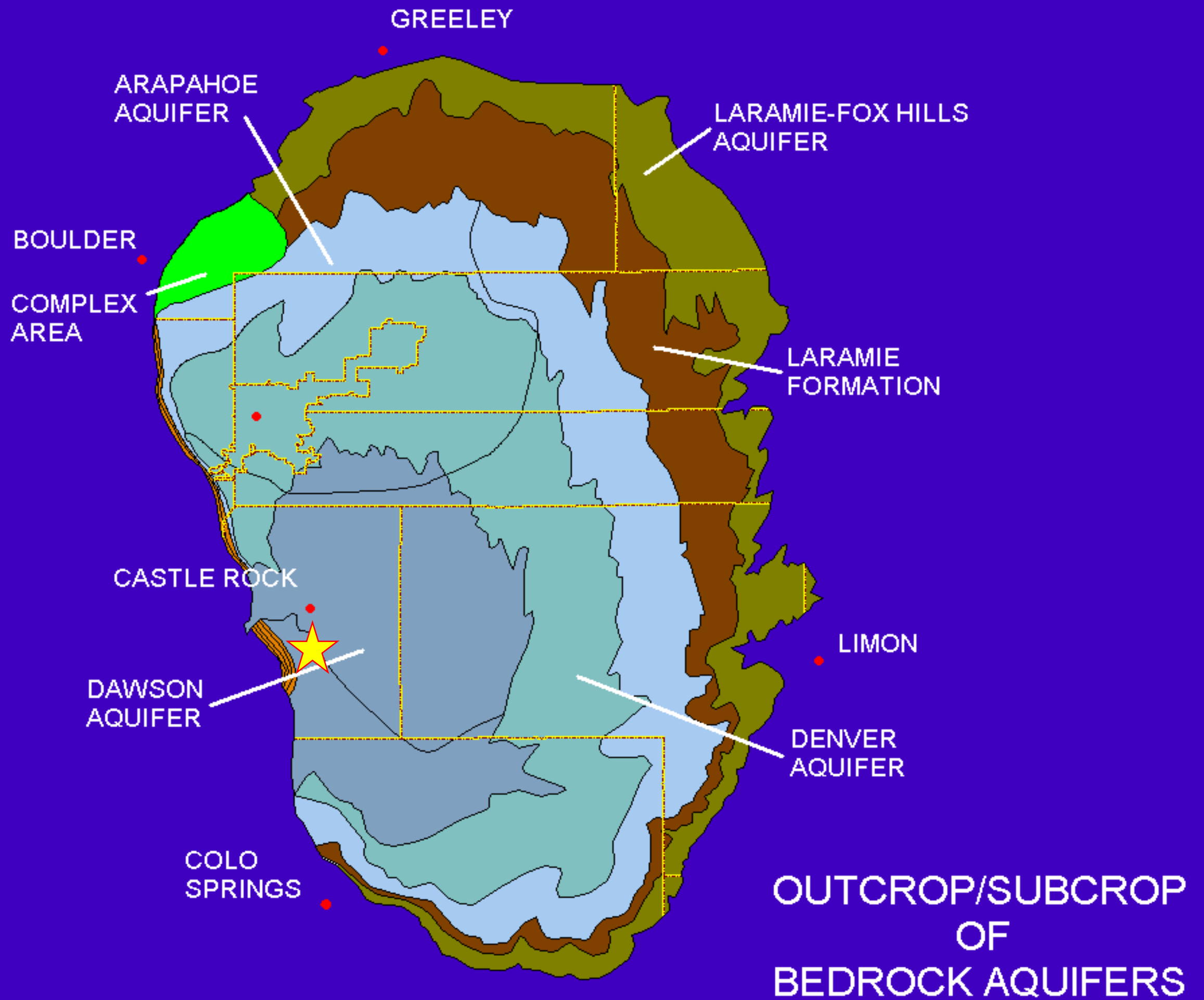
## Denver Basin Ground Water

- A “layering” of water bearing formations (aquifers) along the Front Range
- Special attention from state law
- Formal Rules
  - further guide administration
  - describe physical/hydrologic properties

# Focus on Nontributary Ground Water

## Denver Basin Ground Water

- Four aquifers
  - Dawson (Upper and Lower) aquifer
  - Denver aquifer
  - Arapahoe (Upper and Lower) aquifer
  - Laramie-Fox Hills aquifer

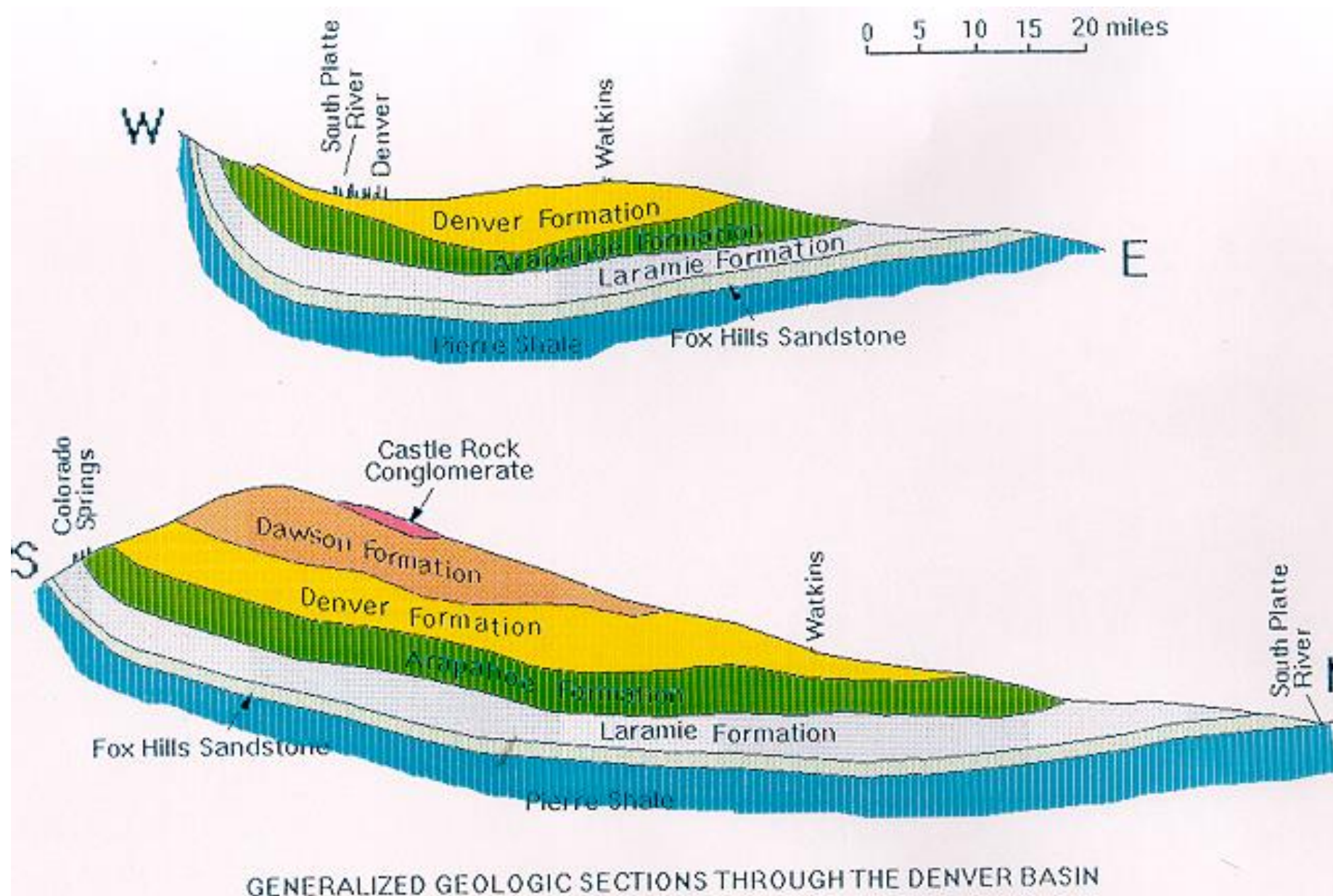




# Focus on Nontributary Ground Water

## Denver Basin Ground Water

- Nontributary ground water has a limited connection with the surface water (below a legal threshold)
  - No potential to injure surface water rights

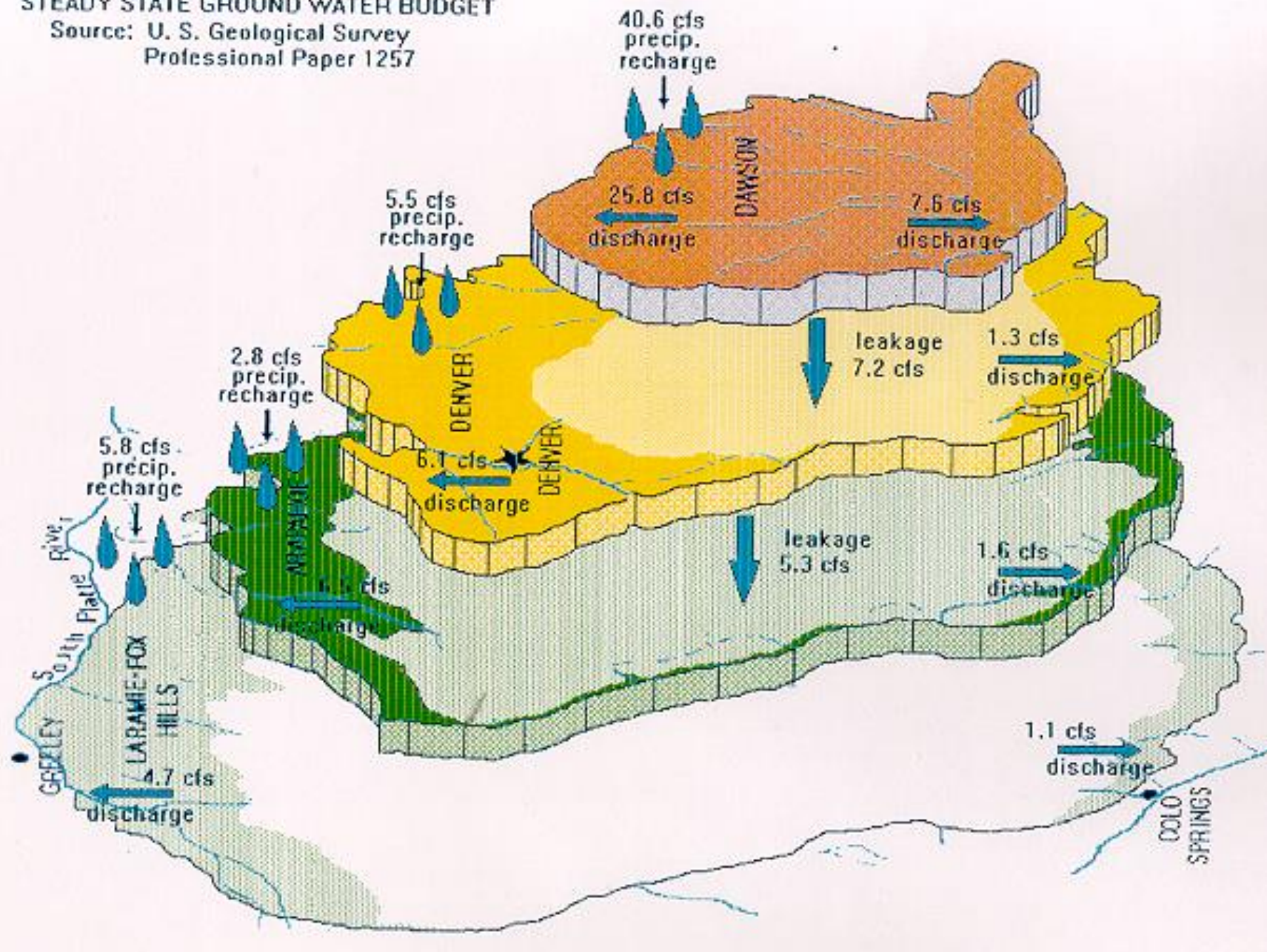




# DENVER BASIN

## STEADY STATE GROUND WATER BUDGET

Source: U. S. Geological Survey  
Professional Paper 1257



# Brief History

- From 1969 on,
  - Laws and rules that addressed tributary ground water
  - Did not apply to nontributary ground water
- 1973, Nontributary ground water law
- 1985, Nontributary ground water law

# Brief History

## 1973, Nontributary ground water law

- Senate Bill 213
  - Ground water use limited to volume underlying a landowner's parcel
  - Landowner has the sole right to withdraw that amount
  - One percent per year (“100-year aquifer life”)
- Still, no definition, no standard for nontributary ground water

# Brief History

## 1985, Nontributary ground water law

- **Senate Bill 5**

- Defined “Nontributary” ground water for the first time (Section 37-90-103(10.5), C.R.S.)
- Determination requires ground water modeling
- Rulemaking by the State Engineer
  - Allowed permitting and administration rules (“Statewide Nontributary Ground Water Rules”)
  - Required rules setting location-specific aquifer characteristics (“Denver Basin Rules”)

# Brief History

## Denver Basin Rules

- Which location-specific aquifer characteristics?
  - Nontributary?
  - Specific yield
  - Tops and bottoms
  - Saturated thickness

# Well Permitting and Adjudication

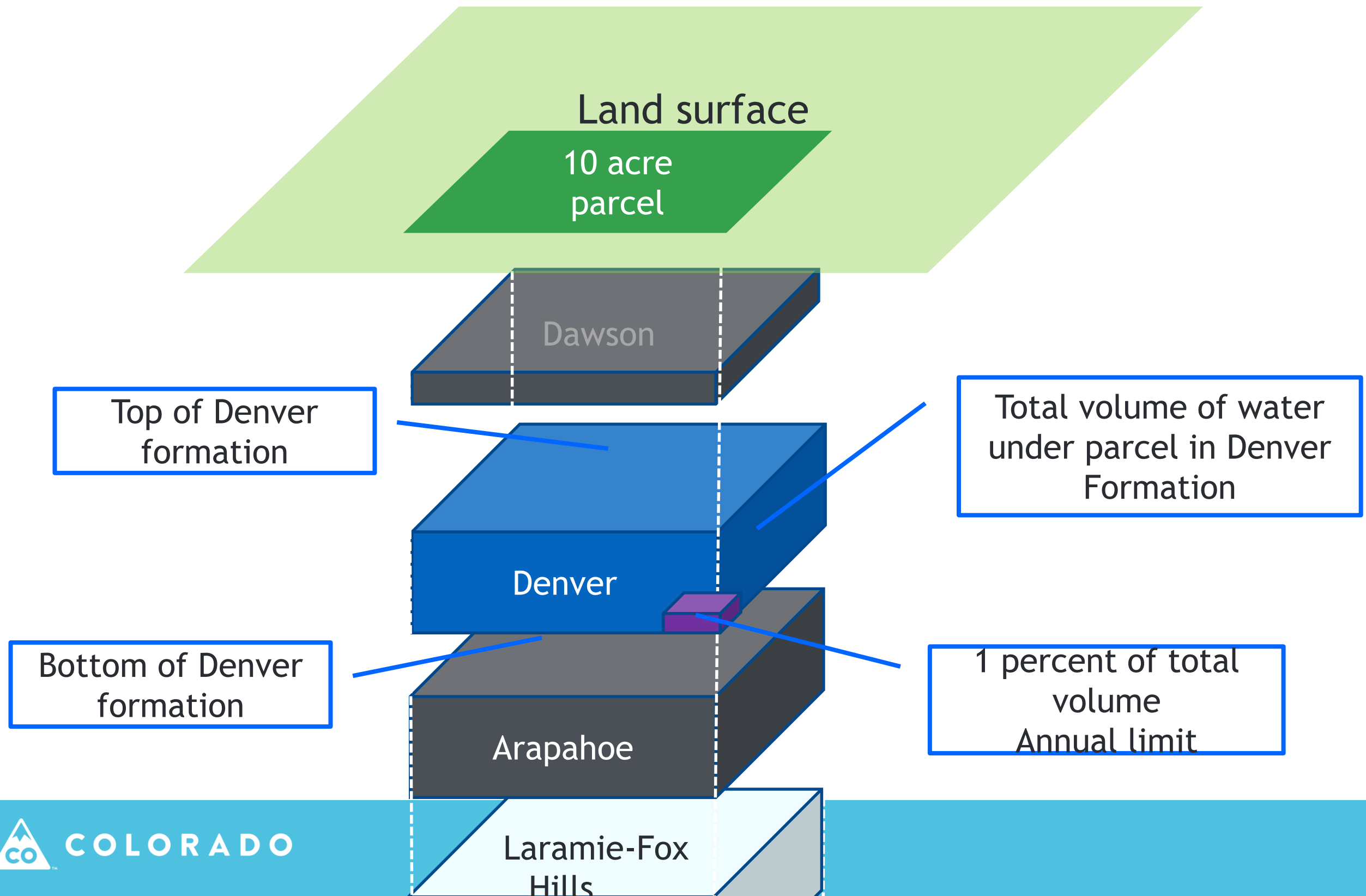
Now, with the help of:

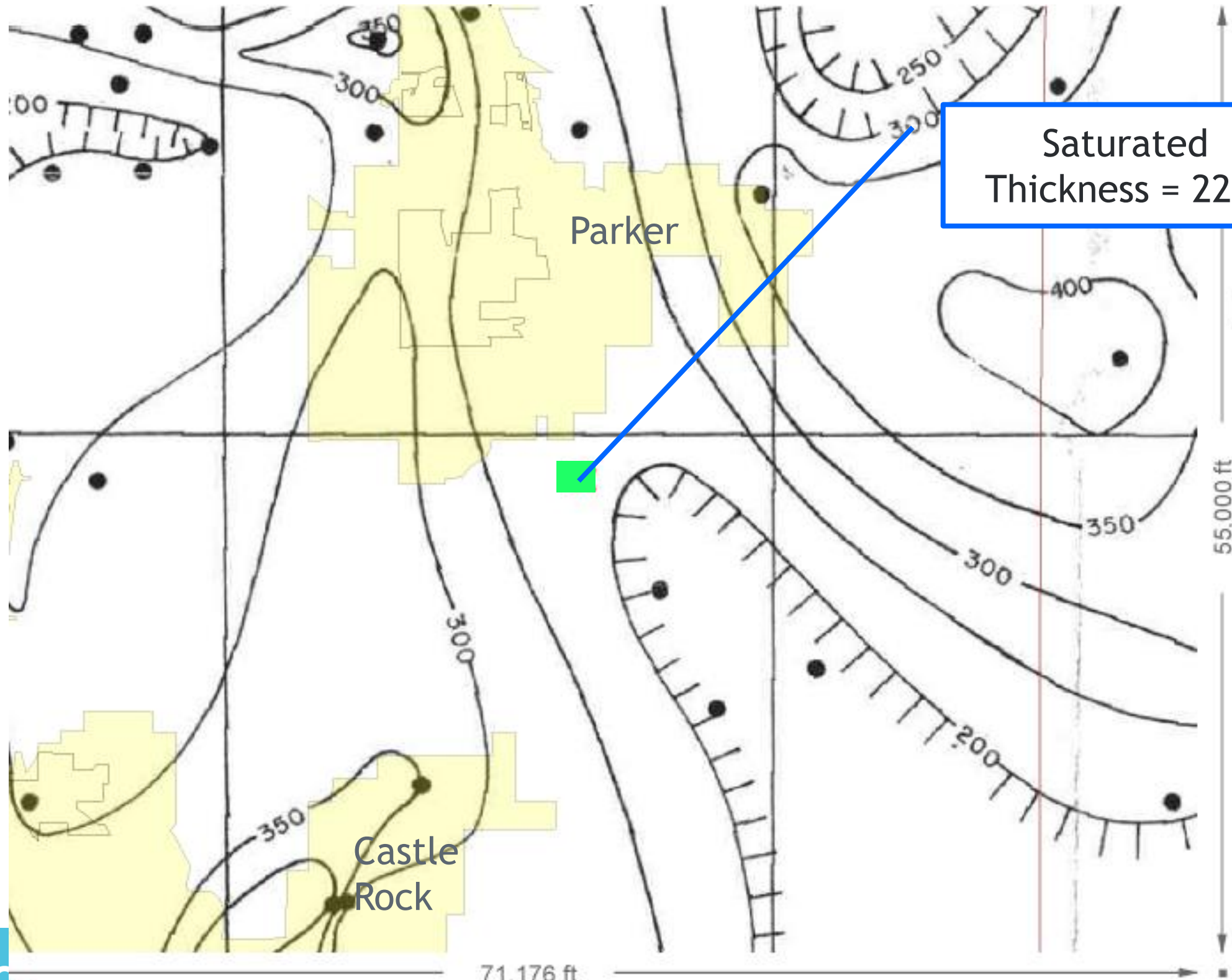
- Senate Bill 213
- Senate Bill 5
- Statewide Nontributary Ground Water Rules
- Denver Basin Rules

...we have what we need to issue well permits and assist the court with adjudication.



# Example Quantification of Underlying Water - Denver Formation





Saturated  
Thickness = 225'

# Calculate Water Volume in Denver Formation

- Per Senate Bill 5, Denver Formation specific yield = 17 percent
- Per Senate Bill 5 (map), saturated thickness = 225'
- Total volume = 10 acres x 17 percent x 225' = 382.5 acre-feet
- 1 percent per year = 3.8 acre-feet per year

# Greenland Ranch

- Specific Yield, likely cannot change
- Saturated Thickness, is subject to change



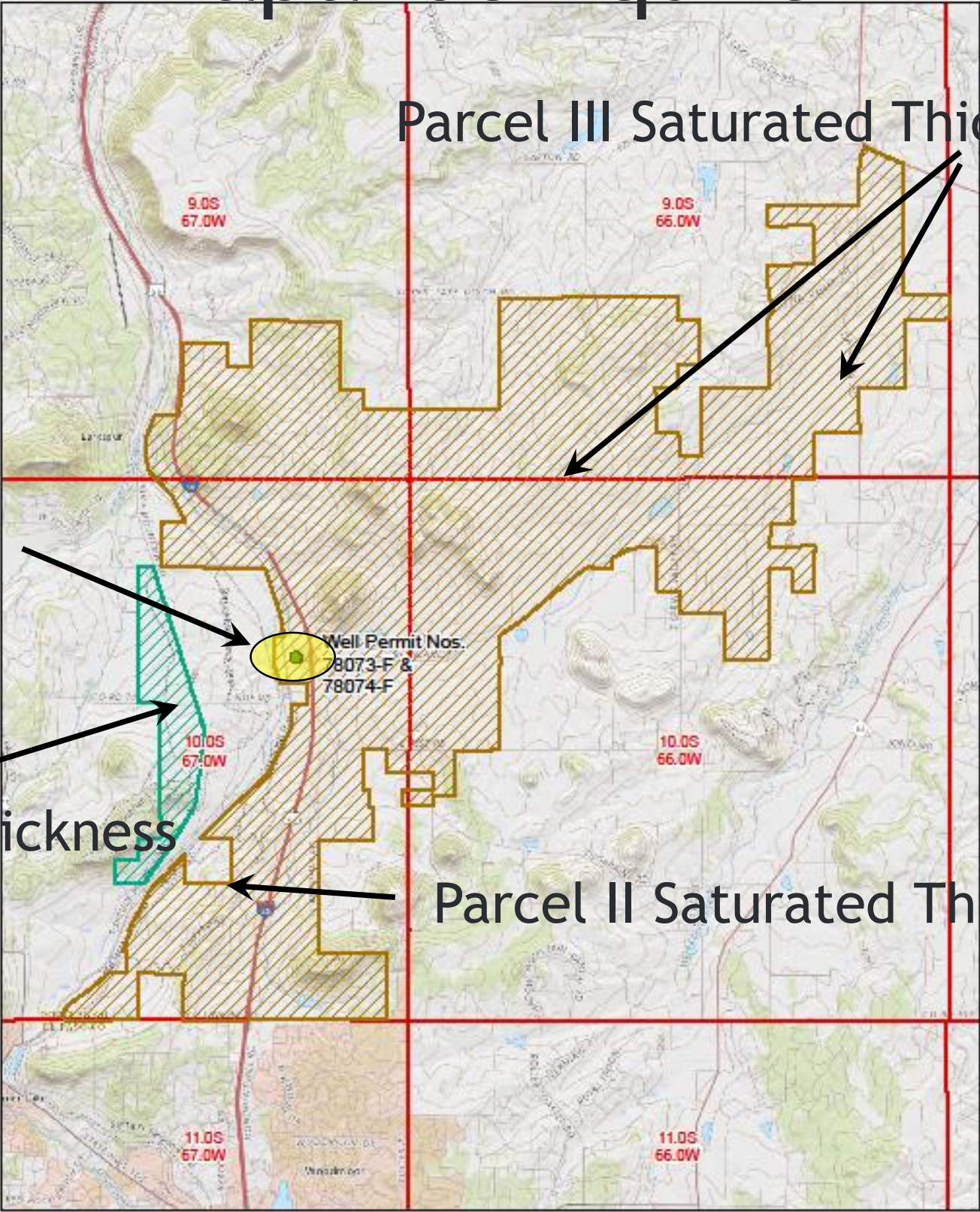
# Arapahoe Aquifer

Parcel III Saturated Thickness = 405 feet

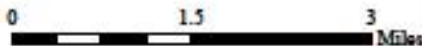
Existing Wells

Parcel I Saturated Thickness = 432 feet

Parcel II Saturated Thickness = 418 feet



Greenland Ranch Joint Venture  
Case No: 94CW038



COLORADO  
Division of Water Resources  
Department of Natural Resources

# Retained Jurisdiction

## Paragraph 28, 94CW038

- Water Judge retains jurisdiction
- Adjust the annual amount based on actual local aquifer characteristics
- Determined from analysis of well data
- Specific provision
  - “After construction of a number of wells over representative sections of the subject property...”



# Retained Jurisdiction

Invoking retained jurisdiction would be premature and likely not effective at this time.

- Not enough data
- Specific provision has not been met
- Any reduction would be a small increment of total amount
  - Current permitted amounts would still stand

# One suggested course of action