



Hydrogeology in Custer County – Alluvial and Fractured Aquifers

This is an abbreviated set of slides from a community presentation on June 27, 2019.

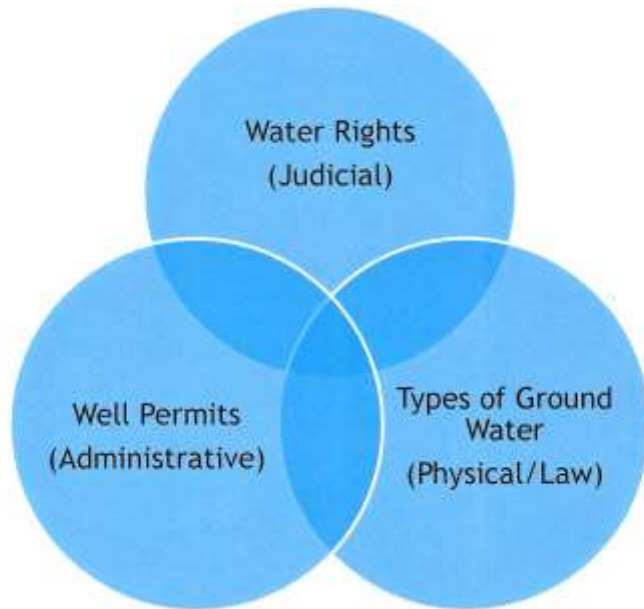
Groundwater in Custer County occurs in a variety of aquifers due to the intricate nature of its geology. As a small and fairly isolated community, there has not been much incentive to study water. That is changing.

The alluvial aquifer along the Wet Mountain Valley floor has a few studies: USGS Water Resources Investigation WRI 78-1 and a current study of alluvial aquifer storage by USGS expected to in September 2020.

The hydrogeology of the fractured rock aquifers has not been studied – the USGS conducted a short period of monitoring from 2002 to 2011 and various USGS geologic maps are all that currently provide information in fractured rock country.

Water is
Confusing

Legal &
Administrative
does not match
up with Physical
Hydrogeology



Despite the legal and administrative rules that humans have created around water in Colorado, the actual physical hydrologic system will dictate whether we are using and managing water in a sustainable manner.

Diagram courtesy of J. Deatheridge, Colorado Division of Water Resources, 2017

Fractured Rock Well? Connections Matter

Threats: Drought, overpumping, increased developed density

Tragic well stories are out there.

Deep wells are expensive to replace.

No guarantee that new well will provide more water

Water-yielding fractures decrease with depth.

Wells with already poor yields (< 2 gpm) may dry altogether

CONCERNS:

Community relationships could be damaged.

Property values could suffer.

Lenders may become unwilling to finance.

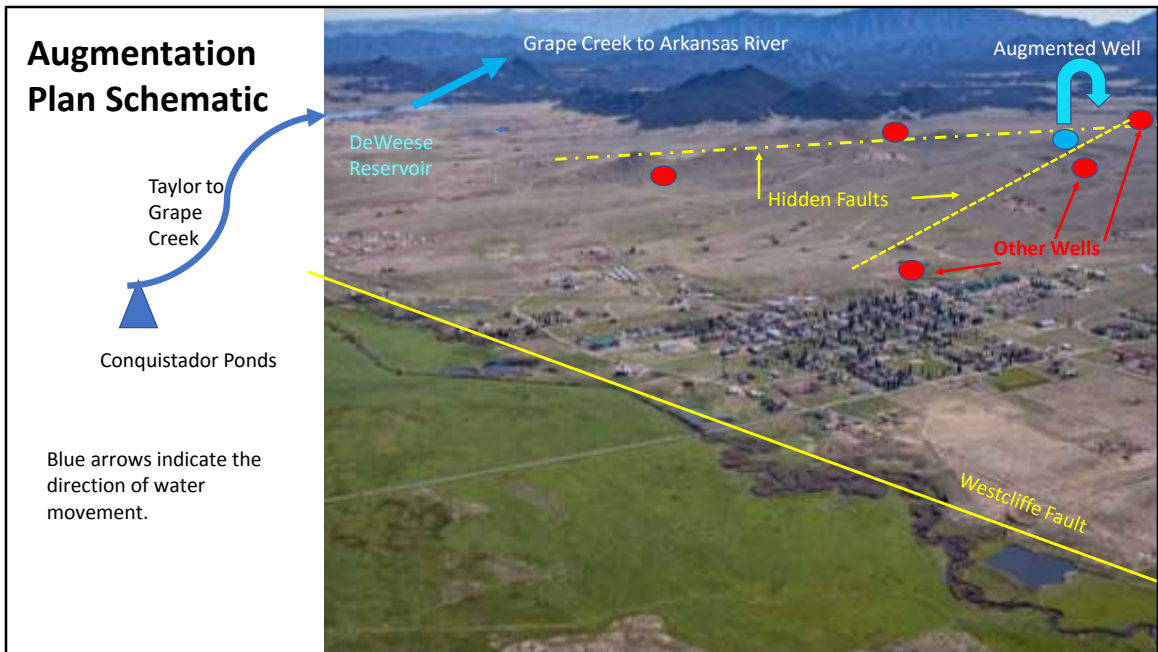
Examples of fractured rock well issues include:

- Well that provides water during a short-term pumping test dries up with sustained household use.

First well in a subdivision reliably provides water until neighbors drill and use their new well. After more development and 3 successive redrills, owner sells. Well does not produce sufficient water to sustain household uses. Residents use water in town for showers to save water at home.

Unable to drill a well with sufficient yield to supply a home. Three attempts at 1,000 feet each, owner sells lot.

Well owner "spikes" well to pass a pumping test prior to sale of home; new owner moves in and finds inadequate water for household uses.



This slide depicts the Upper Arkansas Water Conservancy District’s proposed augmentation plan.

Indoor use only: Wells pumping in fractured rock country could purchase an augmentation certificate from Upper Ark to allow the well to be pumped for outdoor uses.

There is no physical water provided to the well. The fractured rock well can only pump as much as the aquifer will allow. This could lead to drying up of that well and impact neighbors, near and relatively far, depending on the actual fracture interconnections.

The process of augmentation would require Upper Ark to release water from Conquistador Reservoir along Middle Taylor and Grape Creeks, through DeWeese Reservoir, and along Grape Creek to the Arkansas River. This is done to offset the depletions caused by the additional well pumping. Only surface water rights along the augmented reaches are kept whole. Surface water rights along unaugmented tributaries may be adversely affected. There is no recharge to the aquifer.

This proposed plan encourages increased aquifer pumping, with no additional recharge. It protects only surface water rights, not your groundwater aquifers.

Colorado Water Law ≠ Sustainable Groundwater

Augmentation: Only protects senior surface water rights

- Encourages groundwater pumping
- Only replaces water to surface stream (Conquistador, Taylor Creek, Grape Creek, DeWeese)
- Does not replenish the aquifer
- Can lead to well interference, drying between neighbor wells – especially in fractured rock aquifers
- Supports junior uses in a priority system

- Tributary streams that are not physically augmented may suffer.
- Wetlands, wet meadows, springs are not protected.
- Water table elevations in neither alluvial aquifers nor fractured rock aquifers are protected.
- Wells, springs, ponds and other water rights are all considered junior to surface water rights.

What Should We Do As Well Owners?

- Stay aware and be involved:
 - Buy & dry
 - Increased density of housing and wells
- Monitor your own wells – water levels, well yield
 - Provide access for well measurements, if requested.
 - Share your water level, well logs, and well completion data.
 - Be aware of changes – personal and neighboring water uses.
- If in fractured rock, consider alternatives to augmentation
 - Permaculture
 - Rainwater harvesting (uses limited to those allowed by well permit)
 - Hauling water

For rainwater harvesting: If the well is indoor use only, rainwater could supply an attached, but not a freestanding, greenhouse.

Drought can impact fractured aquifer yields more rapidly than the alluvial aquifer and can further decrease the percent of rainfall recharged.

QUESTIONS?

If this presentation was helpful to you, please support the Sustainable Water Program at San Isabel Land Protection Trust. Visit sanisabel.org or call 719.783.3018.

