FAWCETT NOTES from the LWRA WATER and LAND STEWARDSHIP WORKSHOP Part 1

November 11, Junction, Coke Stevenson Memorial -Center (60 participants) 9am - 12:30 pm, part 1

First speaker (of 3):

Peter George, Senior Hydrologist, Collier Consulting, the firm that does the Kimble County Groundwater District's groundwater -availability study. In 2004 he researched a book about Texas aquifers.

The Aquifers of Kimble County.

In general, Kimble County Aquifers, located on the eastern side of the Edwards-Trinity Plateau, are "well-exposed," -meaning very rocky. The Edwards-Trinity Aquifer is so large it has been -subdivided. In our area are the **Ellenburger-San Saba, and -Hickory (-subdivisions).**

The geology

Hensel Sand changes in composition from west to east. It is coarser in this area and gets "finer" in texture to the east. It contains some shale, and includes river and beach deposits in a stratigraphic formation (layered). You can see this in Highway 377 cut-outs near the South Llano State Park. Hensel sand is not 'cemented' so water flows easily through it (good permeability).

The Edwards group consists of two limestone formations: **Fort Terrett** and **Segovia,** sometimes overlapping in places. **Fort Terrett limestone** has uniformly thick layers, relatively flat. **Segovia limestone** contains dolomite (similar to limestone but denser), has voids and sometimes collapses, and water gets into it easily. Fort Terrett/Segovia limestone caps the hills that surround Junction and are also found at Roosevelt.

Aquifer water depth:

George said Texas has the best system for groundwater record-keeping (databases) of all 50 states. Even so, there is a new database that records data when a driller drills a well. (Mostly info about the drilling, not so much about the hydrology, so that water depth has to be inferred by the depth of the well - problematic.) Eventually… this input is fact-checked.

George considers the older database more reliable, even though still missing a lot of older wells.

In general, Trinity wells have to be deeper than Edwards wells. North and East also require deeper wells.

Water quality:

George: "There is PLENTY of water DEEP in the ground, but as it gets deeper, it gets more and more brackish."

Edwards wells generally have fresh water (not saline) as well as most Hickory and Ellenburger-San Saba wells, but if well water is slightly saline (brackish), reverse osmosis filters can correct it. However, the Hickory aquifer sets right under Mason and Llano counties and in places its limestone layers have a potential for radium or radon (a form of radioactivity) that has to be tested for.

Water Flows

All water flows east and southeast in Texas because west Texas is higher than the east. In Kimble County, the hills enable more rainwater to flow directly into the Llano Rivers.

Recharge Rates

The karstic Edwards Aquifer has relatively fast recharge because it contains lots of limestone fractures, Hensel sedimentary layers, and water near the surface. For example, water travels downhill about ½ a mile per day in Sutton County.

A dense sandstone aquifer, on the other hand, has slower recharge and is less sensitive to climate changes. Remember that Hickory and San Saba-Ellenburger sandstone is well cemented (partially because it contains dolomite) so not as permeable as Hensel sandstone (Edwards Aquifer). Aquifers with dense sandstone have to rely on fractures to get the water to flow downward.

Note: The San Antonio Edwards zone has lots of fractures and faults.

NOTE: when someone pumps water into a pond and it sits there, you lose a ton of water by evaporation – wasted water – and **this will affect water levels** for your downstream neighbors.

Alternative Sources of Fresh Water:

1. Brackish (salinated) water – can be de-salinated but is expensive and takes a lot of energy, reverse osmosis, lots of filters.
2. Rainwater Collection
3. Grey water reuse – this is on the increase in cities, especially for municipal irrigation.
4. Water delivery – the people in the new developments in Phoenix, AZ rely on it. (Were they misled by developers? – editors note.)
5. HEB – haha

6. **Needed** – methods of channeling hurricane stormwater back into the aquifer.
7. Speaking of the coast: **Sea water de-salination**? It's an economic calculation – seawater treatment requires no drilling but transportation costs of shipping the water from the coast must be calculated versus the huge cost of drilling deep well, deep wells only to get brackish water…..

Places to look on the web for maps of well locations:

- The Texas Water Development Board website (www.twdb.texas.gov). You can see where recorded wells are located.
- GOOD SOURCE FOR MAPS: Texas Natural Resources Information System (www.tnris.org)
- Texas Railroad Commission – non-intuitive website, but some useful info.
- Groundwater District websites; Kimble County: https://kimblecountygcd.org
- Texas Universities