

Equus Beds Aquifer and Preparing Wichita for Drought: **Proposed Changes**



Background

The City of Wichita's Aquifer Storage & Recovery (ASR) project diverts water from the Little Arkansas River when the river flows are high, treats it to drinking water standards and injects the processed water into the Equus Beds aquifer. By doing this, the City accumulates **recharge** credits with the Kansas Department of Agriculture allowing it to withdraw this additional water from the Equus Beds aquifer when needed. The ability to establish and utilize these credits is critical to ensuring the City can meet the demand during an extended drought (referred to as a 1% drought). There are two interrelated issues that could hamper the City and other user's drought preparedness and compromise the quantity and quality of the water supply.

The Issues

Water Level Limits

Current water permit regulations only allow the use of recharge credits when aquifer groundwater levels are at or above a **minimum standard**. That standard is based on the lowest level in the aquifer's history (**88% of pre-development water depths**), recorded in 1993. The unintended result of this limitation is that at the beginning of a drought, it may be necessary for the City to draw as much water out of the aquifer as possible before reaching the 1993 limit. Other aquifer users will also be making full use of their water rights, which means the 1993 limit will be reached faster before other water rights are utilized and the aquifer water level is lowered even further.

Credit Creation

In 2017, the aquifer had recovered to 98% full. While a high groundwater level provides significant benefits to users and the aquifer, it severely limits the physical recharge capacity of the ASR system and, thereby, the creation of recharge credits and the City's drought readiness. Instead of injecting water into the aquifer, the ASR system can pump the treated water directly to the City, but permit regulations do not allow recharge credit creation through this process. The City can only accumulate recharge credits while the aquifer level is high by drawing water out for City use, then using the ASR system to inject water back into the aquifer.

Proposed Solutions

The City proposes lowering the limit when accrued credits can be used to **80% of pre-development water depths**. This proposed modification would eliminate the need to immediately draw water from the aquifer during a drought and extend the amount time before the City would need to access credits by years, keeping aquifer water levels higher.

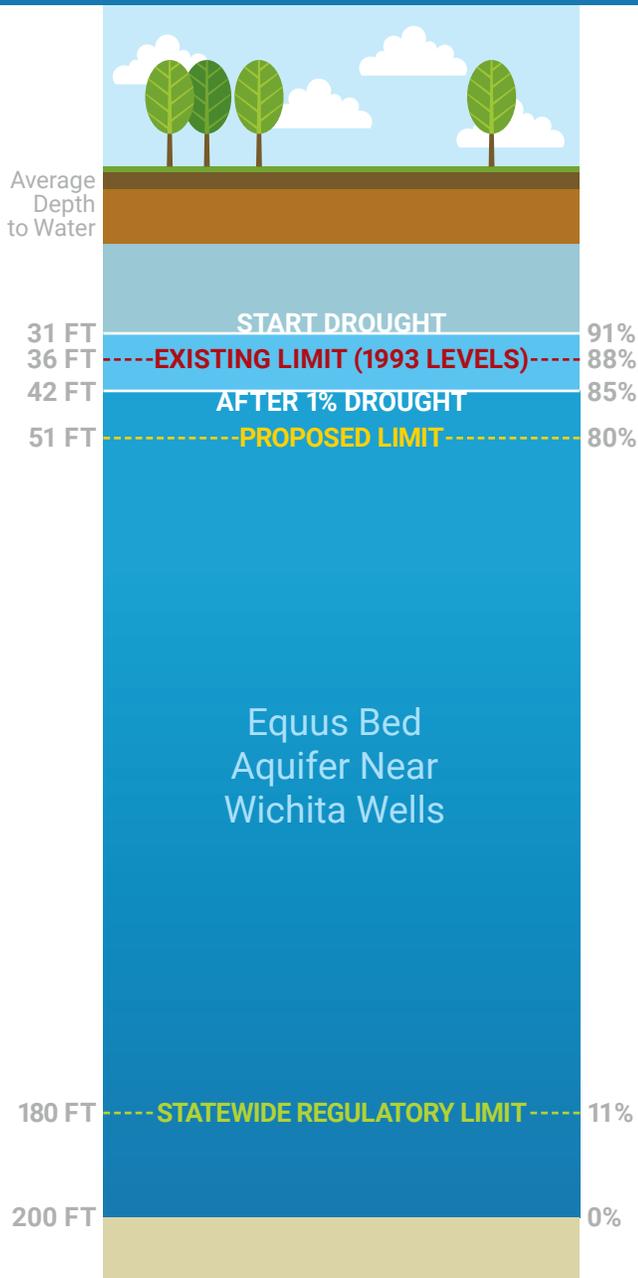
The City proposes that new **maintenance** credits will be accrued by using the ASR system to divert Little Arkansas River water to supply Wichita directly, allowing the City to build the credits needed during a drought. This proposed modification would allow the aquifer to be as full as possible which benefits all users and helps maintain the aquifer's water quality.

Next Steps

The City will present the proposed changes to the public including other aquifer users during a series of public engagement meetings. The proposal will also be shared with the Chief Engineer of the Kansas Department of Agriculture who will make the final decision on whether to revise the water level permit conditions.

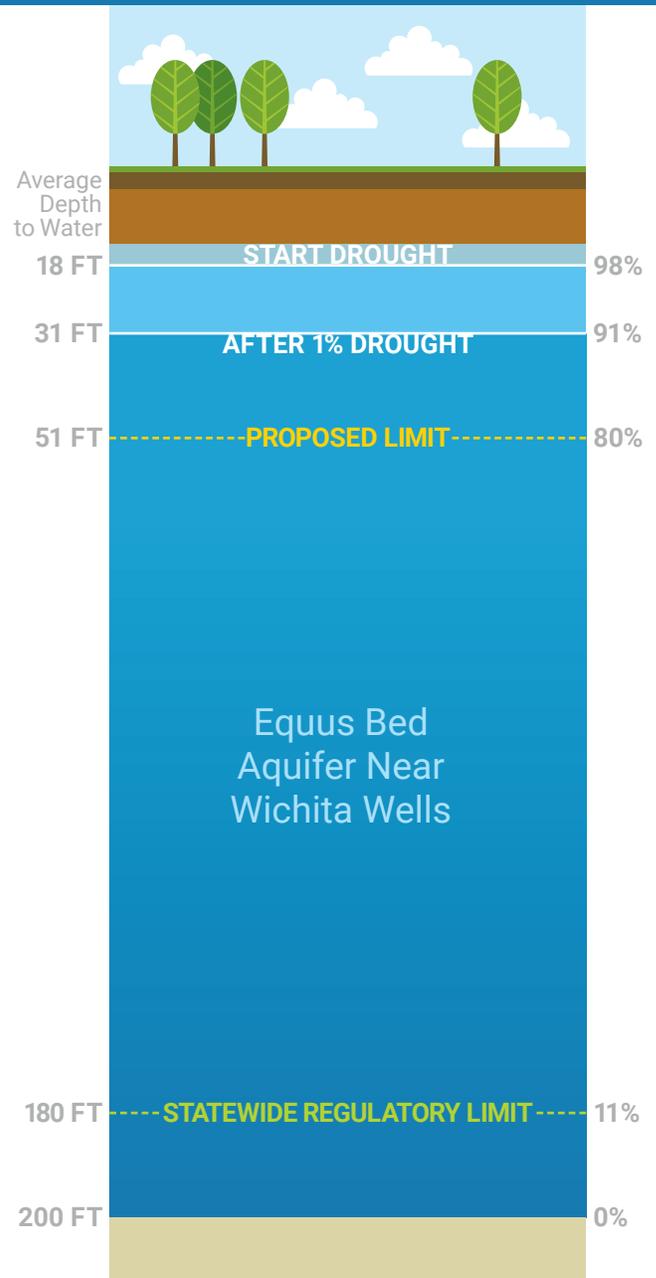
Outcome of 1% Drought Comparisons

Existing Permit Conditions



- The City could access their credits early in the drought while above 1993 levels
- The aquifer depth will lower to 1993 levels within 2 years
- This could occur every 10 years
- This results in lower aquifer levels on an ongoing basis

Proposed Permit Modifications



- The aquifer would be maintained at optimum levels
- The aquifer is protected from unnecessary fluctuations
- This protects water quality – it leaves more native water in the aquifer and slows chloride intrusions