

Reviewing ASR regulation in TX – ensuring success for the future

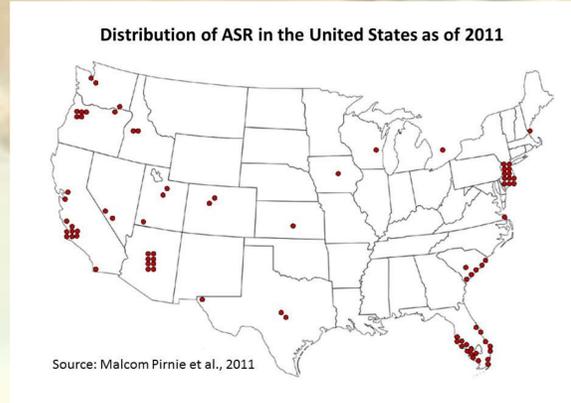
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Abstract

In the state of Texas Aquifer Storage and Recovery (ASR) is becoming a priority water management strategy to meet the future water needs of the state. As ASR is becoming a more feasible water management strategy the inadequacies of the laws and regulations governing the implementation and operation of ASR facilities has begun to be addressed by the State Legislature. House Bill 665 aims to make the implementation of ASR easier. However, there are concerns that it will result in oversight of important hydrogeologic data that is needed for an ASR facility to properly and efficiently operate. Through a review of the proposed changes and other states rules and regulations we aim to address how to best regulate ASR projects to ensure that they are successful at providing Texas the water it needs.

Introduction

In the 2012 Texas State Water Plan, it has been projected that there will be a 40% water gap between water supply and water demand. The 2011 drought brought water quantity issues to the forefront. Climate change is projected to make annual precipitation to become flashy, making water availability more “feast or famine” in nature. Aquifer Storage and Recovery (ASR) is a water management strategy by which water in times of excess can be stored in suitable aquifer formations to be recovered in times of need. Limited availability of surface storage and complications related to construction and life of surface water reservoirs has made ASR a more popular water management strategy in Texas.



Current Texas Law & Regulation

ASR wells are considered Class V Injection wells and must be permitted by TCEQ. Current law states that water must be treated to drinking-water standards prior to storage. Once water is stored, it is by definition “groundwater” and subject to the Rule of Capture as dictated in the Texas Water Code. House Bill 655 (HB 655) was passed in the 2015 Texas State Legislature on June 16th amending some elements of current ASR regulation and permitting processes.

House Bill 655

- Requires public notice of new facility
- Removes pilot project requirement
- Permit by Rule option
- Annual vs. Monthly quality reporting

Current Concerns

- Water rights issues/ownership of recovered water
- Migration of stored water
- Unintended reactions between source water and formation/native groundwater
- Slow and expensive implementation

International Trends

Australia:

- Permit by Rule is allowed – Australian Code of Practice for ASR, Environment Protection Act, and Water Quality Policy of 2003
- Very detailed feasibility reports and modeling

UK:

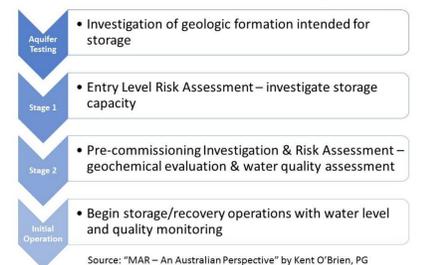
- Pilot Programs practiced

Other Countries that have developed ASR:

- UAE, Israel, and Canada

Trend: More arid countries are less likely to have a full pilot program because the need for additional water quantity is the main prerogative.

Typical ASR Implementation Process, Australia



Suggested Solutions

Similar to Arizona and Oregon, Texas could implement law such that the stored water is legally defined under the category of the source water. For example in Arizona, if the stored water is appropriated surface waters, the recovered water would still be considered as such. This may require the creation some sort of “water banking” system in which the quantity of stored and recovered water is strictly monitored.

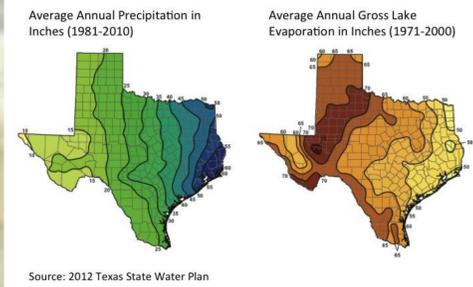
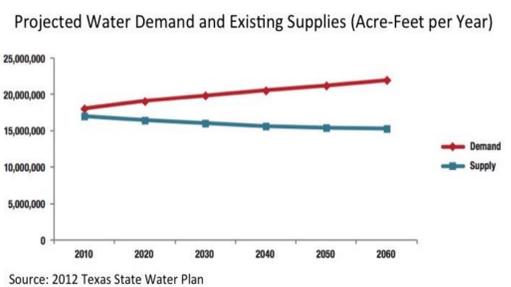
We suggest that the pilot project be reinstated. Although there are other states that do not require one, it has the potential to prevent major problems. Or, if pilot projects are not reinstated as a requirement, the requirements for the initial feasibility study should be extremely thorough. Like Australia, groundwater modeling could be used to predict any possible issues with long-term operations.

Conclusions

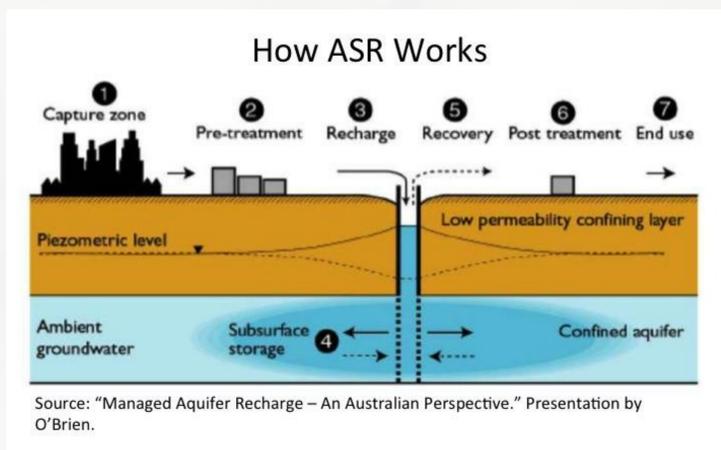
No current ASR laws and regulations are perfect. Each State has their own take on how to implement and regulate ASR based off of their individual goals and experiences. However, by reviewing and comparing them to one another it presents ideas for future legislation. Optimum regulation of these projects will ensure that the water quantity needs of Texas are met in the future.

Sources

- Brand, C. C. (2008). An ASR Primer. *Southwest Hydrology*, 7(3), 16-17. Retrieved from http://www.swhydro.arizona.edu/archive/V7_N3/SWHVol7Issue3.pdf
- ADWR. Arizona Department of Water Resources. *Arizona Water Atlas* (Vol. 1, p. 129). http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/documents/appendix_c.pdf
- ADWR. (2015, February 25). Recharge Credits and Accounting. Retrieved from <http://www.azwater.gov/azdwr/WaterManagement/Recharge/RechargeCreditsandAccounting.htm>
- ADWR. (2014, March 27). Recharge Program Overview. Retrieved from <http://www.azwater.gov/azdwr/WaterManagement/Recharge/RechargeProgramOverview.htm>
- 45, § 3-1. Waters - Underground Water Storage, Savings and Replenishment. Arizona Revised Statutes. <http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=45>
- Florida Administrative Code, Underground Injection Control §§ 65-528.600-630 (1997).
- DEP. (2015, June 30). Florida Department of Environmental Protection. Aquifer Protection Program. Retrieved from <http://www.dep.state.fl.us/Water/uic/index.htm>
- DEP. (2015, June 30). Florida Department of Environmental Protection. Underground Injection Control Permitting Process. Retrieved from <http://www.dep.state.fl.us/water/uic/forms/UIC-PermittingProcess.pdf>
- Pine, D. G. (2003). ASR Systems LLC. *Water Quality in Aquifer Storage Recovery (ASR) Wells* (Tech.). <http://asrforum.com/fatestudy/documents/asrpopa111503.pdf>
- DEP. (2014, May). Florida Department of Environmental Protection. UIC Permit Application Guidance. Retrieved from <http://www.dep.state.fl.us/water/uic/forms/UIC-PermitProcessingGuidance.pdf>
- 11) *Water rights in Oregon: An introduction to Oregon's water laws and water rights system*. (2002). Salem, OR (158 12th St., NE, Salem 97301-4172): State of Oregon, Water Resources Dept.
- OAR. Oregon Administrative Rules, Aquifer Storage and Recovery (ASR) and Artificial Groundwater Recharge §§ 690-350.0010-0030. http://arcweb.sos.state.or.us/pages/rules/oars_600/oar_690_350.html
- Malcom Pirnie, I., ASR Systems, L., Jackson, S., McCarthy & Wilson, LLP. 2011. An Assessment of Aquifer Storage and Recovery in Texas. 0904830940.
- Vaughan, E.G. et al., 2012. Water for Texas 2012 State Water Plan. In: Board, T.W.D. (Ed.), pp. 314.
- Code of Practice for Aquifer Storage and Recovery. Environmental Protection Authority of Southern Australia (2004). Adelaide, SA.
- O'Brien, Kent, PG. *Managed Aquifer Recharge – An Australian Perspective*. San Francisco, CA.



Basic ASR Information



Uses of ASR

- Future Consumption or “Water Banking”
- Seawater Intrusion Prevention
- Wetland Enhancement
- Land Surface Subsidence Prevention
- Groundwater Pollution Remediation

ASR Across the United States

	Texas	Arizona	Oregon	Florida
Groundwater Water Rights	Rule of Capture	Reasonable Use (except in AMAs)	Prior Appropriation	Reasonable Use
Purpose	Future Supply	Increase groundwater quantities & future supply	Future Supply	Future Supply, Wetland Enhancement, Seawater Intrusion Prevention
Reporting Requirements	Monthly	Annual	N/A	Monthly
Implementation Requirements	Permit Approval & Phases	Permit Approval & Damages & Feasibility Study	Permit Approval & Limited License	Permit Approval
Recovered Water Characterization	Groundwater	Source Water	Source Water	Stored Use