Aquifer Storage and Recovery: Its State in the State

31st Annual SWQM Workshop

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The following presentation is based upon professional research and analysis within the scope of the Texas Water Development Board’s statutory responsibilities and priorities but, unless specifically noted, does not necessarily reflect official Board positions or decisions.
What is ASR?

- Aquifer Storage and Recovery
  - “...the injection of water into a geologic formation for the purpose of subsequent recovery and beneficial use by the project operator.” (Texas Water Code Section 27.151(1))
  - Storage of water in a suitable aquifer and recovery of that water during times of need for beneficial use
  - Source water can be reclaimed, groundwater, or surface water; surface is most prevalent
  - In Texas, we have El Paso (reclaimed), Kerrville (surface), San Antonio (groundwater)
Benefits (partial)

- Eliminates evaporative losses
  - 7.25M acre-feet lost in average year (20% of surface reservoir storage, 40% of demand)

- Mitigates surface inundation effects
  - Mid-size ASR of 30k acre-feet would require 2,500 acre surface reservoir

- San Antonio – Edwards Aquifer Authority
  - Component of the EA Habitat Conservation Plan
  - Maintain minimum flows at Comal and San Marcos springs
  - Protect endangered species

- Kerrville
  - Diversion from Guadalupe River constrained by TCEQ permit to maintain minimum river flow
  - ASR used to augment supply during low flow periods
Rome Avenue ASR

- Located in Tampa, Florida
- Storage in the Lower Floridan Aquifer
- Eight wells, 10 million MGD recovery

*MGD = million gallons per day

Source: Google Earth 2015
H2Oaks ASR

- Southern Bexar County
- San Antonio owns 3200 acres
- Leases land back to ranchers
- 29 ASR wells, 60 MGD capacity, 100k+ acre-feet in storage

Source: The Edwards Aquifer Website 2015
Limits/Challenges (partial)

- Requires appropriate geology
- Offers no flood control
- Pretreatment requirements
  - Injected water must not cause noncompliance with national primary drinking water standards
  - In practice, most injected water is treated to potable standards
- Hydraulic migration
  - Movement of stored water away from recovery well
  - Function of gradient, conductivity, and storage duration
  - Easier to manage with higher well counts
- Chemical interaction
  - Well plugging – swelling clays
  - Chemical mobilization – arsenic particularly
  - Development of disinfection by-products - THM’s particularly
  - Early-study formation geochemical testing highly recommended
2017 State Water Plan

- Seven regions include ASR as a Recommended Water Management Strategy
  - 53,341 ac-ft decade 2020; 152,000 ac-ft decade 2070
  - Increase from 0.9% to 1.8% of total from 2012 to 2017 plan

**Included only supply allocated to a water user group**
Aquifer Storage and Recovery (ASR) in Texas

Operating Facilities
- Decommissioned Operations
- Completed Studies
- Ongoing Studies
  - 2017 Recommended Water Management Strategy Projects
- Texas Counties

Ongoing studies are those funded by TWDB. There are other efforts not funded by TWDB.

Funding Background

- 84th Texas Legislature, House Bill 1, Rider 25
  - $1,000,000 from General Revenue Fund
  - For innovative storage approaches, including but not exclusively, ASR
  - One-for-one matching grant funds
  - Competitive grant application process
    - Request for application notice – September 22, 2015
    - Application deadline – November 3, 2015
    - Grant approval – January 7, 2016
Application Summary

- Six applications received
  - Four ASR field studies
  - One ASR desktop/planning study
  - One enhanced recharge field study
- Three grants awarded
- Studies to be completed in 2019

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<tr>
<th>Recipient</th>
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<td>Corpus Christi Aquifer Storage and Recovery Conservation District</td>
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