Aquifer Recharge and Beneficial Reuse

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Topics

• El Paso Water Supply
• ASR concepts
• Fred Hervey Water Reclamation Plant background
• Injection Wells or Basins?
• Uses of Fred Hervey Water Reclamation Plant effluent
• Future plans
Surface Water Plants
Hueco Wells
Mesilla Wells
Desalination Plant
2015: TOTAL PRODUCTION
Acre-Feet

- Rio Grande: 36,134.86; 31%
- Hueco: 56,387; 49%
- Mesilla: 23,437; 20%
Aquifer Recharge?
Aquifer Storage and Recovery

- El Paso Water Utilities uses highly-treated effluent for aquifer recharge
- Groundwater levels
- Improve water quality of the aquifer
Aquifer Storage and Recovery

- Fred Hervey Water Reclamation Plant effluent is also used for turf irrigation and industrial cooling.
- Since 1985, over 75,000 ac-ft of effluent has been recharged to the Hueco Bolson.
- Only reclaimed water ASR program in Texas.
Fred Hervey Water Reclamation Plant

- First oxidation pond built in late 1950s
- Original plant built in 1985 (10 MGD)
- Plant located 20 miles from the Rio Grande, effluent discharge to the river not economical
- Expanded plant capacity (12 MGD)
Production Wells

Fred Hervey Water Reclamation Plant
Injection Well Summary

• 10 injection wells completed with galvanized casing and well screen in 1984

• Due to concerns about corrosion in well casing material, PVC was used to complete injection wells

• 2 PVC wells are in service
AWWARF Research Foundation Study (2003)

- Comparison of alternative methods for recharge of a deep aquifer
- Spreading Basin completed beneath the caliche at the surface
- Dry well completed in vadose zone below caliche and clays to speed transit to aquifer
Spreading Basins

Planned Spreading Basin
Regional Water Table

Reclaimed Water from Fred Hervey Water Reclamation Plant. (Average Injection 800 GPM)

Monitoring Well
Nested Piezometers

Not to Scale

Regional Water Table

AWWARF Study Infiltration Basin
Initial Start-Up of Recharge Basin
Recharge Basins

- Cost effective
- More land area required
- Must be completed below caliche horizon
Shallow Injection Well (Dry Well)

Monitoring Well

Nested Piezometers

Reclaimed Water from Fred Hervey Water Reclamation Plant. (Average Injection 130 GPM)

Regional Water Table

Not to Scale
Shallow Injection Well (Dry Well)

Casing Diameter 12"

Injection Tubing 4"

Total depth 170 ft
Shallow Injection Wells (Dry Wells)

- Well has modest land area requirements
- Well screen is installed beneath surficial caliche
Surface Completion of Dry Well
Study Results

• Dry well was ineffective

• Spreading basin was capable of maintaining a high recharge rate

• Basins are a cost effective alternative to dry wells or injection wells
Uses of Fred Hervey Effluent
Fred Hervey Reclaimed Water Recharge
(1985-2015)
Monthly Injected Average (1985-2014)
2015 Fred Hervey Effluent Distribution by Use (acre-feet)

- El Paso Electric: 3017, 47%
- Painted Dunes Golf Course: 487, 8%
- Basins: 2538, 39%
- Injection Wells: 298, 5%
- Others: 76, 1%
2015-Fred Hervey Effluent All Uses

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Additional Aquifer Recharge Using Treated Surface Water

- Water rights for 70,000 AF/year
- Maximum annual diversion – 60,000 AF/year
- Early irrigation season supply vs. demand
- Aquifer Recharge Master Plan
Future Plans

• Additional spreading basins included into EPWU Northeast plan

• 5 “basin pairs” in current TCEQ permit

• Surface Water from Rio Grande (Jonathan Rogers Water Treatment Plant)
Questions?
Fred Hervey Effluent Painted Dunes Golf Course - 2015

Month

Acre-Feet

JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC
Fred Hervey Effluent E.P.E.C. - 2015

Month

JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC

Acre-Feet

0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400