Managing Effluent Recharge and Recovery in Southern Arizona

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Permit and Regulatory Compliance Officer

PIMA COUNTY
WASTEWATER RECLAMATION

Compliance and Regulatory Affairs Office
• Arizona Groundwater Management Code (1980)

• Underground Water Storage and Recovery Program (1986)

• Underground Water Storage, Savings, and Replenishment Act (1994)
Recharge Options

Managed Recharge

Constructed Recharge
Earning Effluent Recharge Credits:

<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>Credits Earned</th>
<th>Cut to the Aquifer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructed Managed New</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Existing*</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>95%</td>
<td>5%</td>
</tr>
</tbody>
</table>

* Water stored at an “existing managed USF” on or after January 31, 2019
Constructed Recharge

Advantages:
- 100% credit for recharged water
- Maximize recharge through proper management of basins

Disadvantages:
- Expensive to build and require considerable maintenance
Managed Recharge Advantages

- Minimal construction costs
- Little or no maintenance required
- Storm events scour channel naturally
Managed Recharge Advantages

Creates rich riparian habitat for:

Fish
Birds and other wildlife
Invertebrates and insects
Plant upgrades improved quality of effluent into the Santa Cruz River
Managed Recharge Advantages

Asset to the community
Managed Recharge Disadvantages

Channel may clog in absence of large flow events

Flow out of recharge project area – no credits.
Managed Recharge Disadvantages

Partial Credit for Recharge:

Existing Facilities: 95%

New Facilities: 50%
An exception to the 50/50 Rule:

New managed underground storage facilities that could add value to a national park, national monument, or state park and the water stored is effluent…

may be eligible for 95 percent recharge credits
Recovery of Stored Water

Two options:
• Storage and recovery on an annual basis
• Store water to accrue long-term credits, and
• Recover water through the use of long-term credits.
Long-term Storage Credit Transfers:

“...the holder of long-term storage credits may assign by grant, gift, sale, lease or exchange all or part of the holder’s long-term storage credits.” (ARS section 45–855.01, subsection C)

Acquired credits have some restrictions when being used for the determination of an assured water supply.
Recovering Stored Water:

“...the proposed recovery of stored water will not unreasonably cause damage to surrounding land or other users from the concentration of wells. The Director shall make this determination pursuant to rules adopted by the Director.” (A.R.S. section 451.01, subsection B.1.)
What is Unreasonable damage?

- Additional drawdown in excess of 10 feet after the first 5 years of the recovery of stored water.
- Recovery that causes additional unreasonably increasing damage from additional regional land subsidence.
- Recovery that causes migration of contaminated groundwater from a remedial action site to an existing well, rendering it unusable for its purpose.

(A.A.C. R12-15-1303(B))
User Recovering Within an AMA and Outside the Area of Impact of the Stored Water:

- Recovery location must be consistent with the Tucson AMA’s management plan and goals.
- Nearby cities, towns, irrigation districts must consent to location of the recovery well.
Recovering Effluent Within an AMA within the Area of Impact of the Stored Water of a managed USF using a new well within or near service areas of water company, irrigation district, those entities have the right to recover the water on the person’s behalf.
Effluent Recharge Projects in Pima County

- Four constructed recharge facilities
- Three managed recharge projects
- One constructed basin that accrues no credits
Avra Valley WRF (Black Wash Recharge Facility)

- Plant permitted capacity 4 MGD
- Recharge permit limit 4,480 AFY
- 1,563 AF recharged in 2020
BNROD (two treatment trains)

Recharge basins

Lined pond

Corona de Tucson WRF

- BNROD capacity 1 MGD
- Permitted recharge capacity 1,120 AFY
- 416 AF recharged in 2020
Arivaca Junction WRF

- Inflow 46 AF in 2020

- Estimated 11 AF of percolation through unlined bottom

- About 17 AF delivered to nearby ranch for irrigation.
Green Valley WRF

- Plant permitted capacity 4.1 MGD

- Inflow averaged 2.2 MGD (2,500 AFY) in 2020
Green Valley WRF

Effluent produced in 2020:
BNROD 1,600 AF (Sold to RR/QC)
Lagoon system 436 AF
Obtained June 2020:

- Underground Storage Facility Permit &
- Groundwater Storage Permit

- Phase 1 permitted recharge 640 AFY
- Phase 2 permitted recharge 802 AFY
Green Valley WRF

- Authorized to discharge to Santa Cruz River under an AZPDES permit

- Did not pursue instream recharge owing to rule that allows for a 50% recharge credit
# Recharge Credits

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>Delivery Volume</th>
<th>Evaporation &amp; Transpiration</th>
<th>Contribution to Stream Diversions</th>
<th>Outflow</th>
<th>Cut to Aquifer</th>
<th>Recharge Credit</th>
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<tbody>
<tr>
<td>Lower Santa Cruz Managed Recharge Project (LSCMRP)</td>
<td>512.07</td>
<td>72.98</td>
<td>136.17</td>
<td>227.20</td>
<td>15.15</td>
<td>287.77</td>
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<td>Marana High Plains Effluent Recharge Project (MHPERP)</td>
<td>622.80</td>
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<td>Corona de Tucson</td>
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<td>Green Valley Recharge Project</td>
<td>226.20</td>
<td>11.4</td>
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<td>214.80</td>
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<tr>
<td>Avra Valley</td>
<td>1,569.62</td>
<td>6.5</td>
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<td>1,563.12</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>3,346.37</strong></td>
<td><strong>108.28</strong></td>
<td><strong>136.17</strong></td>
<td><strong>227.20</strong></td>
<td><strong>15.15</strong></td>
<td><strong>3,077.57</strong></td>
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## Pima County’s Recharge Credits

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<tr>
<th>Year</th>
<th>Lower Santa Cruz Managed Recharge Project (LSCMRP)</th>
<th>Marana High Plains Effluent Recharge Project (MHPERP)</th>
<th>Corona de Tucson Underground Storage Facility</th>
<th>Avra Valley Underground Storage Facility</th>
<th>Green Valley Recharge Project</th>
<th>Total County Storage Credits</th>
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<tr>
<td></td>
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Tucson AMA

2020  Total Effluent 61,936 AF

2013  Total Effluent 67,482 AF
Questions?

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(520) 724-6033