

***Fundamental Assumptions for
Technical Evaluation of Selected
Springflow Protection Programs***

***Edwards Aquifer
Recovery Implementation Program***

Steering Committee and Stakeholders

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Topics of Discussion

- 1) Selected Programs**
- 2) Technical Assumptions**
- 3) Planned Scale Optimization Runs**

Five Programs

- 1. Aquifer Storage and Recovery**
- 2. Combination**
 - a) Selected Type II Recharge Structures**
 - b) Dry-Year Option**
 - c) Land Stewardship**
 - d) SAWS South Bexar ASR Facility**
- 3. Recharge and Recirculation**
- 4. Trade-Offs (Bexar County)**
- 5. Trade-Offs (Comal and Hays Counties)**

Program #1: Aquifer Storage and Recovery

1. Source Water

- a) **Unrestricted Edwards Irrigation Permits (No CPM: 66,700 acft/yr; Stage 4 CPM: 40,000 acft/yr)**
- b) **1.14(h) Water**

2. ASR Operation

- a) **Fill and maintain ASR storage with Unrestricted Irrigation Permits and 1.14(h) water**
- b) **Stage 4 permitted pumping at about 340,000 acft/yr**
- c) **Recharge for Springflow Protection is to injection wells and/or surface recharge structures**
- d) **Target storage and recovery is to maintain 30-60 cfs at Comal Springs and 40-52 cfs at San Marcos Springs**

Program #1: Aquifer Storage and Recovery

3. Physical Facilities

- a) Bexar County Edwards Well Field
- b) Carrizo ASR Well Field (Probably in Wilson County)
- c) Pipelines and Pump Stations
- d) Recharge Facilities (Injection Wells/Recharge Structures)

4. Scale Optimization Runs

- a) Run #2: Increase Pumping Restrictions to Limit Edwards Pumping to 320,000 acft/yr in Stage 4
- b) Run #3: Increase Pumping Restrictions to Limit Edwards Pumping to 286,000 acft/yr in Stage 4
- c) Run #4: Same as Run #2, plus Dry Comal and Blanco Type II recharge structures

Program #2: Combination

1. Source Water

- a) **Selected Type II Recharge Structures (Frio, Sabinal, Hondo, Verde, San Geronimo, Cibolo , and Salado FRS)**
- b) **Dry-Year Option: To be defined by Dry-Year Work Group or SAWS**
- c) **Land Stewardship (Initially Prepared 2011 Region L Water Plan, Section 4C.7). Produces about 5,600 acft/yr of firm yield at Canyon Reservoir. **Water would be stored in Canyon Reservoir, delivered via the Guadalupe River, and diverted to the recharge zone for San Marcos Springflow Protection during Drought.****
- d) **SAWS South Bexar ASR Facility**
 - i. **30 MGD during Stage 3**
 - ii. **30 MGD during Stage 4**
 - iii. **Not to exceed 40,000 acft**

Program #2: Combination

2. Physical Facilities

- a) **Type II Recharge Structures at Selected Sites**
- b) **Dry-Year Option: Program to Developed and Administered**
- c) **Land Stewardship:**
 - i. **Program to be Developed and Administered**
 - ii. **Storage of Enhanced Runoff in Canyon Reservoir**
 - iii. **Delivery via Guadalupe River**
 - iv. **Diversion to Recharge Zone/Structure**
- d) **SAWS South Bexar ASR Facility: Existing**

Program #2: Combination

3. Combination Operation and Scale Optimization

- a) **Run #1: Selected Type II Recharge Structures**
- b) **Run #2: Run #1 plus Dry-Year Option**
- c) **Run #3: Run #2 plus Land Stewardship**
- d) **Run #4: Run #3 plus SAWS South Bexar ASR Facility**

Program #3: Recharge and Recirculation

1. Source Water

- a) Selected Type II Recharge Structures (Frio, Sabinal, Hondo, Verde)
- b) Unrestricted Edwards Irrigation Permits (No CPM: 66,700 acft/yr; Stage 4 CPM: 40,000 acft/yr)

2. R&R Operation

- a) Pump Unrestricted Irrigation Permits and divert to the Recharge Structures, even when Comal Trigger is in Effect.
- b) Recover the Recharge from Type II and Unrestricted Irrigation Permits that occurred 1-year earlier and Recirculate to the Hondo and Verde Recharge Structures. Recovery is limited by % of water remaining in aquifer (Factor).

Program #3: Recharge and Recirculation

2. R&R Operation (continued)

- c) Recirculation ceases when Comal Trigger is in Effect
- d) Recharge that is missed when Trigger was in Effect can be Recovered immediately after the Trigger is Suspended, but no more than 2 years after recharge.
- e) Initial Trigger is set at 150 cfs at Comal Springs

3. Physical Facilities

- a) Type II Recharge Structures (Hondo & Verde)
- b) Edwards Well Field in East-Central Medina County
- c) Pipelines/Pump Stations

Program #3: Recharge and Recirculation

4. Scale Optimization Runs (1a drought for all)

- a) Run #2: Set Trigger at 100 cfs
- b) Run #3: Set Trigger at 100 cfs, new flow split between Hondo and Verde, qualitative explain any adjustments for above surface “storage”
- c) Run #4: Set trigger at 30 cfs, new flow split between Hondo and Verde

Program #4: Trade-Offs (Bexar County)

1. Source Water

- a) **Unrestricted Edwards Irrigation Permits (No CPM: 66,700 acft/yr; Stage 4 CPM: 40,000 acf/tyr)**
- b) **1.14(h) Water**

2. Trade-Off Operation

- a) **Fill and maintain ASR storage with Unrestricted Irrigation Permits and 1.14(h) water**
- b) **Stage 4 permitted pumping at about 340,000 acft/yr**
- c) **At Onset of Drought, Begin Recovery of Stored Water in ASR**
- d) **Deliver Water to Major Distribution Centers in Bexar County**
- e) **Target storage and recovery to maintain 30-60 cfs at Comal Springs and 40-52 cfs at San Marcos Springs**

Program #4: Trade-Offs (Bexar County)

3. Physical Facilities

- a) Bexar County Edwards Well Field
- b) Carrizo ASR Well Field (Probably in Wilson County)
- c) Pipelines and Pump Stations
- d) Interconnect to Major Distribution Centers in Bexar County

4. Scale Optimization Runs

- a) Run #2: Add Selected Type II Projects and SAWS Recycle Water Program (as outlined in Initially Prepared 2011 Region L Water Plan)
- b) Run #3: Same as Run #2, plus Regional Carrizo and Brackish Wilcox for SAWS (as outlined in Initially Prepared 2011 Region L Water Plan)
- c) Run #4: Run #3 but with Increased Stage 4 Pumping Restrictions to Limit Edwards Pumping to 320,000 acft/yr in Stage 4

Program #5: Trade-Offs (Comal and Hays Counties)

1. Source Water

- a) Initially Prepared 2011 Region L Water Plan
 - i. GBRA Mid-Basin Project (Surface Water),
 - ii. GBRA Mid-Basin Project (Conjunctive Use),
 - iii. GBRA Simsboro Project, or
 - iv. Hays/Caldwell PUA Project

2. Trade-Off Operation

- a) Acquire Non-Edwards Source of Water on a Permanent, Continual Basis
- b) Permanently Retire the Edwards Permits
- c) Stage 4 permitted pumping at about 340,000 acft/yr

Program #5: Trade-Offs (Comal and Hays Counties)

3. Physical Facilities

- a) **Interconnect of New Regional Project with Major Distribution Centers in Cities of New Braunfels and San Marcos**

4. Scale Optimization

- a) **Run #2: Add Bexar County Trade-Off that includes ASR.**
- b) **Run #3: Run #2 with Increased Pumping Restrictions to Limit Edwards Pumping to 320,000 acft/yr in Stage 4**
- c) **Run #4: To Be Determined**

***Questions
&
Discussion***