

**Lower Colorado Regional Water Planning Group  
Water Management Strategies Meeting  
AECOM, Treaty Oak Conference Room  
September 16, 2019**

1. Lauri Gillam called meeting to order at 9:36 a.m.
  
2. Attendees (23)  
Committee Members:  
Lauri Gillam – Region K, Small Municipalities Rep, Water Management Strategies Committee Chair  
Daniel Berglund – Region K, Small Business Rep  
David Van Dresar – Region K, Water Districts Rep  
David Wheelock – Region K, River Authority Rep  
Mike Reagor – Region K, Small Municipalities Rep  
Teresa Lutes – Region K, Municipalities Rep  
Karen Haschke – Region K, Public Rep  
David Lindsay – Region K, Recreation Rep (Alternate)

Additional Attendees:

David Bradsby – Region K, TPWD Rep  
Christianne Castleberry – Region K, Water Utilities Rep (Alternate)  
Temple McKinnon – TWDB  
Jaime Burke – AECOM  
Kiera Brown – AECOM  
Helen Gerlach – Austin Water  
Richard Hoffpauir – Hoffpauir Consulting  
Joe Trungale – Trungale Engineering  
Rebecca Batchelder – LCRA  
Stacy Pandey – LCRA  
Leonard Oliver – LCRA  
Jordan Furnans – LRE Water, LLC (representing Goldthwaite)  
Cindy Smiley – Smiley Law Firm  
Daniel Bulovas – Central Texas Water Coalition  
Adam Connor – Freese & Nichols

3. Public Comments
  - a. None.
  
4. Minutes Approval
  - a. Draft of August 8, 2019

- i. Daniel Berglund motioned to approve the minutes. David Van Dresar seconded. Committee passed.
  
- 5. Status Update on Water Management Strategy Evaluations
  - a. 25 strategies under RWPG or committee review.
  - b. 24 strategies in progress/pending data.
  - c. 11 strategies not started.
  - d. Consultant is working to complete strategy evaluation by October 9 Region K RWPG meeting.
  
- 6. Goldthwaite Strategy Request
  - a. Goldthwaite recently purchased part of an irrigation water right for 1,000 ac-ft/yr with a 1956 priority. Total diversion rights will now be 2,500 ac-ft/yr. 250 ac-ft/yr of reuse is currently included in Goldthwaite's water rights permit; this will be removed in amended permit, as reuse should not be included in ROR diversion rights.
  - b. Goldthwaite Requests
    - i. Requesting 2021 Plan strategies to reflect the following:
      - 1. Water Right Permit Amendment
      - 2. Expanding Goldthwaite's reservoir storage capacity - – still 0 AFY yield during drought of record
      - 3. Direct Reuse
  - c. Discussion
    - i. Consultant proposed two options for incorporation into the RWP:
      - 1. Describe Goldthwaite's plans as a sub-category of existing strategies:
        - a. Water Right Permit Amendment
        - b. Reservoir Capacity Expansion
        - c. Reuse
      - 2. Create a new strategy specifically for Goldthwaite
      - 3. Committee agreed to include a subsection about Goldthwaite and refer to the other strategy sections, so no scope of work changes are needed.
  
- 7. Draft Strategy Review
  - a. First drafts of strategy write-ups were previously presented to WMS committee for BS/EACD Edwards/Middle Trinity ASR, BS/EACD Saline Edwards ASR, Municipal Conservation, and Rainwater Harvesting. Consultant incorporated comments from discussion.
  - b. Daniel Berglund motioned to send the strategies as-is to the RWPG for review. David Wheelock seconded. Committee passed.
  
- 8. Groundwater Strategies
  - a. Expand Use of Local Groundwater

- i. Expand Local Use of Groundwater involves pumping additional groundwater from an aquifer that the WUG is currently using as a source, either using the WUG’s existing wells or drilling additional wells.
- ii. General Discussion
  - 1. David Lindsay suggested that the groundwater write-ups include total strategy volume by aquifer.
    - a. Jaime Burke explained that regional water planning allocates groundwater by aquifer/county/basin divisions, and these totals are included in the write-up for each aquifer.
    - b. Can look at adding if it makes sense.
  - 2. Mike Reagor requested an explanation of the drawdown levels listed in the environmental impacts sections. He asked if all areas will experience a 240 ft drawdown in the Carrizo-Wilcox Aquifer, for example.
    - a. David Van Dresar explained that Desired Future Conditions (DFCs) are determined by Groundwater Conservation Districts (GCDs). GCDs hold public meetings, which can be attended to learn more about and provide input on groundwater conservation practices.
    - b. Mike Reagor requested that language be included in the “agricultural impacts” section of the groundwater write-ups to indicate potential impacts on agricultural users.
    - c. Daniel Berglund said that the GCDs assess the potential for increased drawdown in drought conditions when issuing groundwater permits.
    - d. David Wheelock requested that GCD language throughout the groundwater strategies be revised: each groundwater strategy will contribute drawdown, but that individual strategies will not result in the maximum drawdown defined by the GCD.
  - 3. David Wheelock requested that the following sentence be revised: “There are currently no irrigation WUGs with supplies of irrigation water or livestock water from the Carrizo-Wilcox Aquifer in Region K.” Wheelock requested that the applicable county be specified (i.e., “...in Bastrop County in Region K”).
  - 4. David Lindsay asked if the Regional Water Plan includes an overview of aquifer status.
    - a. David Van Dresar explained that GCDs provide information for overall aquifer management, but that no chapter in the Regional Water Plan is set aside for this purpose. The GCD websites provide a variety of resources for more information on aquifer management.
  - 5. Expand Local Use of Groundwater - Carrizo-Wilcox Aquifer Strategy

- a. David Wheelock asked what is meant by Aqua WSC being supplied from the “Brazos (to Colorado)” river basin.
    - i. Consultant explained that groundwater will be supplied from the Carrizo-Wilcox Aquifer in the Brazos basin to meet needs in the Colorado basin.
  - b. David Wheelock said that unit cost for Aqua WSC (Bastrop County) seemed high and asked for more information.
    - i. The consultant clarifies that Aqua WSC is supplied by Carrizo-Wilcox water from two river basins. To accomplish this, additional infrastructure is required, resulting in a higher cost. Additional infrastructure includes two separate well fields (to pull from each basin), each with a contingency pump, connected by a pipeline.
  - c. David Wheelock requested that an annual GCD permit fee of \$11/AFY be included in the Expanded Use of Carrizo-Wilcox Aquifer (in Bastrop County) costs. He suggested putting it under the “purchase of water” line item. Wheelock requested that the consultant check if other GCDs have permit fees as well.
  - d. David Wheelock requested that treatment costs for removal of iron and manganese be included in groundwater strategy costs.
    - i. David Van Dresar suggested including the capital costs of new treatment facilities only for new development of groundwater for municipal and manufacturing users. For expansion of existing groundwater sources, it can be assumed that treatment facilities already exist and that only the additional cost of treatment need be included. Consultant agreed.
  - e. David Wheelock requested that the applicable decade be added to the DFCs.
6. Expand Local Use of Groundwater - Ellenburger-San Saba Aquifer
- a. Bertram (Burnet County)
    - i. Mike Reagor said that the costs for this strategy seem high. Consultant indicated that the Bertram strategy will include treatment of surface water, given that the groundwater is sourced from an old quarry pit that is open to the atmosphere. This treatment infrastructure increases the cost substantially.
    - ii. Lauri Gillam noted that Bertram’s 2070 need is 394 ac-ft/yr, but the strategy amount is for 3000 ac-ft/yr. Gillam asked for an explanation for the excess supply.

Consultant will contact Bertram to request more details on their water resource plans.

7. Expand Local Use of Groundwater - Gulf Coast Aquifer Strategy
    - a. David Wheelock indicated on error on the summary sheet: Wharton (Wharton County, Brazos-Colorado Basin) should have a unit cost of \$272/ac-ft, not \$593/ac-ft. Consultant agreed.
  8. Expand Local Use of Groundwater – Carrizo-Wilcox Alternative Strategy
    - a. David Wheelock requested that a \$11/ac-ft/yr GCD permit fee be added to the costs.
    - b. David Wheelock requested that the following sentence be removed from the environmental impacts section: “An additional result of the MAG exceedance is the potential for decreased springflows.”
- b. Development of New Groundwater
- i. Development of New Groundwater involves drilling wells to pump groundwater from an aquifer that the WUG is currently not using as a source.
  - ii. General Discussion
    1. David Lindsay requested that the plan specify whether a strategy was requested by a WUG or proposed by the planning group/consultant. Consultant agreed.
    2. David Lindsay asked for the status of the TWDB Groundwater-Surface Water Interaction Study that is being implemented by LCRA.
      - a. Rebecca Batchelder indicated that the initial site test wasn’t viable, and that a new site is currently being identified for the study. The study is ongoing.
  - iii. Development of New Groundwater - Gulf Coast Aquifer Strategy
    1. Daniel Berglund asked how the yield of 510 ac-ft/yr was determined for the Irrigation/Matagorda County WUG and said that the yield seemed low for agricultural users. Consultant explained that only 510 ac-ft/yr was needed to meet the needs of the WUG.
  - iv. Development of New Groundwater – Yegua-Jackson Aquifer Strategy
    1. David Van Dresar requested that the costs be updated to include 20 acres of land acquisition, as that is what is required for this district based on the yield.
    2. David Van Dresar requested that the peaking factor be adjusted to 1 instead of 2, as that is what is applicable for the district, based on the yield.
  - v. Development of New Groundwater - Hickory Aquifer Strategy
    1. Mike Reagor said that the yield for the Mining/Burnet County/Colorado Basin WUG (1,000 ac-ft/yr) seemed high. Consultant clarified that the specified yield is available under the MAG, and that the WUG has a need greater than this amount (4,626 ac-ft/yr).

## 9. Oceanwater Desalination

### a. Strategy Definition and Cost

- i. The proposed desalination process would divert seawater from the Gulf of Mexico near the Matagorda Bay, treat the water using reverse osmosis (RO) filtration, and deliver treated water to industrial users in and around Bay City.
- ii. Currently, the strategy has no sponsor. Without a sponsor, it will be placed under the “Considered, But Not Recommended” section of the plan.
- iii. Online: 2060
- iv. Project Yield: 22,400 ac-ft/yr
- v. Project Costs: Total Project Costs: \$575,331,000; Annual Cost: \$79,072,000; Unit Cost: \$3,530/ac-ft

### b. Discussion

- i. Teresa Lutes provided comments and suggested edits for the strategy. Consultant will review comments and provide for committee approval at the next meeting.
- ii. David Wheelock requested that the following sentence in the agricultural and natural resource impacts section be revised: “While this strategy would be too expensive for agricultural users, it could potentially provide a source of water to lower basin users that would otherwise use water from the Highland Lakes or the Arbuckle Reservoir.” Wheelock requested that the strategy be revised to not be specific to LCRA’s water management plan, as LCRA isn’t necessarily the sponsor for this strategy. Additionally, Wheelock requested that the language, “while this strategy would be too expensive for agricultural users,” be removed.

## 10. Direct Reuse

### a. Blanco

- i. Online: 2030
- ii. Project Yield: 146 ac-ft/yr
- iii. Project Costs: Total Project Costs: \$1,529,000; Annual Cost: \$132,000; Unit Cost: \$904/ac-ft

### b. Horseshoe Bay

- i. Online: 2030
- ii. Project Yield: 154 ac-ft/yr
- iii. Project Costs: Total Project Costs: \$1,270,000; Annual Cost: \$106,000; Unit Cost: \$688/ac-ft

### c. Marble Falls

- i. Online: 2030
- ii. Project Yield: 100 ac-ft/yr (2030); 500 ac-ft/yr (2070)
- iii. Project Costs: Total Project Costs: \$2,010,000; Annual Cost: \$177,000; Unit Cost: \$354/ac-ft

### d. Meadowlakes

- i. Online: 2020
  - ii. Project Yield: 75 ac-ft/yr
  - iii. Project Costs: Total Project Costs: \$0; Annual Cost: \$0; Unit Cost: \$0/ac-ft
- e. Fredericksburg
  - i. Online: 2030
  - ii. Project Yield: 132 ac-ft/yr
  - iii. Project Costs: Total Project Costs: \$9,280,000; Annual Cost: \$720,000; Unit Cost: \$508/ac-ft
- f. Buda
  - i. Online: 2020
  - ii. Project Yield: 100 ac-ft/yr (2020); 1,680 ac-ft/yr (2070)
  - iii. Project Costs: Total Project Costs: \$7,562,000; Annual Cost: \$627,000; Unit Cost: \$373/ac-ft
- g. Dripping Springs WSC
  - i. Online: 2030
  - ii. Project Yield: 390 ac-ft/yr (2030); 672 ac-ft/yr (2070)
  - iii. Project Costs: Total Project Costs: \$2,056,000; Annual Cost: \$187,000; Unit Cost: \$278/ac-ft
- h. West Travis County PUA
  - i. Online: 2030
  - ii. Project Yield: 224 ac-ft/yr
  - iii. Project Costs: Total Project Costs: \$1,778,000; Annual Cost: \$153,000; Unit Cost: \$683/ac-ft
- i. Lago Vista
  - i. Online: 2030
  - ii. Project Yield: 224 ac-ft/yr (2030); 673 ac-ft/yr (2070)
  - iii. Project Costs: Total Project Costs: \$2,140,000; Annual Cost: \$229,000; Unit Cost: \$340/ac-ft
- j. Lakeway MUD
  - i. Online: 2030
  - ii. Project Yield: 100 ac-ft/yr (2030); 500 ac-ft/yr (2070)
  - iii. Project Costs: Total Project Costs: \$2,009,000; Annual Cost: \$177,000; Unit Cost: \$354/ac-ft
- k. Travis County WCID 17
  - i. Online: 2030
  - ii. Project Yield: 510 ac-ft/yr
  - iii. Project Costs: Total Project Costs: \$10,737,000; Annual Cost: \$867,000; Unit Cost: \$1,700/ac-ft
- l. General Discussion
  - i. David Wheelock requested that the discrepancy between costs calculated with the TWDB's costing tool and those calculated externally (e.g., Travis County WCID 17) be investigated, as they differ by up to \$1,400/ac-ft.

- ii. Teresa Lutes said that the Austin Reuse Strategy is costed at approximately \$1,500/ac-ft.
- iii. Stacy Pandey requested that the Horseshoe Bay description be revised. Pandey requested that the entity be referred to as “Horseshoe Bay,” not “The Horseshoe Bay Subdivision of Summit Rock.”
- iv. Stacy Pandey requested the Meadowlakes description be revised. Pandey indicated that the infrastructure has already been constructed and requested that the strategy be updated to indicate this.

## 11. Downstream Return Flows

### a. Strategy Definition and Cost

- i. This strategy accounts for return flows from Pflugerville that are already returned to the Colorado River. Return flows are calculated as 60 percent of the total demand for Pflugerville, post drought management and conservation savings, and reduced by 10 percent, to account for channel losses and evaporation. The strategy allocates Pflugerville’s return flows to LCRA and other downstream users.
- ii. Online: 2020
- iii. Project Yield: 3,985 ac-ft/yr (2020); 8,267 ac-ft/yr (2070)
- iv. Project Costs: No capital costs.

### b. Discussion

- i. Mike Reagor asked why no costs for treatment were included.
  - 1. Any treatment improvements required to maintain return flow/discharge quality are the responsibility of the wastewater plant, and not the downstream water receiver. The wastewater plant will be required to maintain discharge quality regardless of whether the return flows are utilized as a supply, as this strategy proposes to do.
- ii. David Wheelock requested the following language from the environmental impacts section be removed: “During drought years, return flows will have a higher concentration of nutrients and pollutants due to increased conservation and drought management efforts. Additional treatment may be needed to ensure environmental protection and to ensure quality for use as a water supply.” The reasoning for this redaction is as follows: while flows into the wastewater plant may become more concentrated during a drought, discharge requirements will remain the same. Thus, the quality of return flows should be maintained during times of drought. Consultant agreed to remove the language.
- iii. David Wheelock requested that the cost of the additional pumping required to intake the return flows be included.

## 12. Irrigation Conservation

### a. Tail Water Recovery

- i. Status: draft strategy write-up in review – costing.



- b. Sprinkler Irrigation
  - i. Status: draft strategy write-up in review – costing.
- c. Irrigation Operations Conveyance Improvements
  - i. Status: preliminary strategy write-up in progress – coordinating with LCRA.
  - ii. Daniel Berglund asked if this strategy applies to privately owned canals.
  - iii. Stacy Pandey requested that private canals be discussed in their own section in the On-Farm Conservation write-up.
- d. Real-Time Monitoring
  - i. Status: data collection.
  - ii. Daniel Berglund said that his GCD requires that irrigation, municipal, and manufacturing well owners report their usage annually. Berglund requested that Region K propose (in the policy recommendations section of the plan) that all GCDs require their irrigation, municipal, and manufacturing users to report annual groundwater usage.
- e. Drip Irrigation for Non-Rice Crops
  - i. Status: Preliminary strategy write-up in progress – water savings.
  - ii. Consultant hasn't found verifiable water savings. Some studies show that water consumption may increase after implementing drip irrigation. Continue evaluating strategy?
    - 1. Daniel Berglund said that drip irrigation in the Gulf Coast Aquifer region is difficult to implement because the soil is highly saturated. Berglund said that water consumption may increase when using drip irrigation because, when farmers save on water expenses, they have more financial resources available to grow additional crops. Berglund requested that the consultant's sources be examined to determine if the acreage is held constant for the studies claiming water consumption increases.
    - 2. Mike Reagor said that he knows of grape, pecan, and peach farmers who are already implementing drip irrigation.
    - 3. David Lindsay said that this strategy will likely have high costs, due to high maintenance requirements.
    - 4. Stacy Pandey requested that the strategy include discussion of specific crops, as opposed to generalizing trends and applications for all non-rice crops. Pandey also requested that the write-up include discussion of why drip irrigation is not feasible for rice crops.
    - 5. Consultant will consider for Mills County Irrigation.
- f. On-Farm Conservation
  - i. Status: preliminary strategy write-up in progress.
  - ii. Sub-strategies include: Precision Land Leveling, Multiple Field Inlets, Conveyance Improvements, Irrigation Pipeline, Reduced Levee Intervals

1. Daniel Berglund and Stacy Pandey discussed the specifics of Reduced Levee Intervals. Leveling land conserves water by reducing the required volume of water to create the minimum ponding depth. By making levees less steep (reducing the number of elevation steps), land is made more level and water conserved. Because level intervals are related to land leveling, Daniel Berglund and Stacy Pandey requested that Reduced Levee Intervals be included as a subcategory within the Precision Land Leveling Strategy.

### 13. LCRA Water Management Strategy Evaluations

- a. Notified planning group of the following strategies pending internal review:
  - i. LCRA Expand Groundwater in Bastrop County
  - ii. LCRA Groundwater for Fayette Power Plant – onsite (smaller yield within MAG)
  - iii. LCRA Alternative Groundwater for Fayette Power Plant – onsite (larger yield exceeding MAG)
  - iv. LCRA Groundwater for Fayette Power Plant – offsite
  - v. LCRA Baylor Creek Reservoir
  - vi. Alternative LCRA Supplement Environmental Flows with Brackish Groundwater
- b. No discussion.

### 14. Water Purchase and Contracts

- a. Notified planning group of assumptions for the following strategies, which are pending internal review:
  - i. LCRA New Contracts/Contract Amendments – no details yet
  - ii. Water Purchase/Water Purchase Amendments
    1. Barton Creek WSC
      - a. Purchase Amendment from Travis County MUD 4
      - b. Cost per 1,000 gallons: \$5.00 > Cost per ac-ft: \$1,629
    2. Creedmoor Maha WSC
      - a. Purchase Amendment from Aqua WSC
      - b. Cost per 1,000 gallons: \$3.75 > Cost per ac-ft: \$1,222
    3. Travis County MUD 14
      - a. Purchase Amendment from Aqua WSC
      - b. Cost per 1,000 gallons: \$3.75 > Cost per ac-ft: \$1,222
    4. Hays County Mining
      - a. New Purchase from Buda (reuse) - Included in 2016 RWP
      - b. Cost per 1,000 gallons: \$4.90 > Cost per ac-ft: \$1,597
- b. No discussion.

### 15. New / Other Business

- a. None.

16. Next Meeting

- a. The next WMS committee meeting will be held Thursday, October 3, 2019, 10:00 a.m. – 4:00 p.m.
- b. The next RWPG meeting will be October 9, 2019 at 10:00 a.m. at the LCRA Dalchau Service Center.

17. Public Comments

- a. Cindy Smiley requested that the plan specify whether a strategy was requested by a WUG or proposed by the planning group.
  - i. Consultant agreed and explained that the plan currently has a section documenting WUG survey responses, however this information could be included in the overall WUG strategy application table as well.
- b. Cindy Smiley requested that the strategy descriptions identify if costs were calculated with the TWDB's costing tool or calculated externally. Consultant confirmed that this is included in strategy write-ups.

18. Lauri Gillam adjourned at 12:16 p.m.