

**LSCR Basin Study  
Project Team Meeting #13  
August 27, 2019**

## **NOTES**

**Attendees:**

|                                  |  |
|----------------------------------|--|
| Eve Halper, Reclamation          | Kathy Jacobs, U of Arizona (phone)     |
| Kathy Chavez, Pima County        | Neha Gupta, U of Arizona               |
| Monica Pickenpaugh, U of Arizona | Wally Wilson, Metro Water              |
| Marie Light, Pima County /DEQ    | Steve Piper, Reclamation (phone)       |
| Jaime Galayda, Tucson Water      | Kip Volpe, Vail Water (phone)          |
| Lee Comrie, PAG                  | Beth Scully, Tucson Water              |
| Kevin Lansey, U of Arizona       | Asia Philbin, Marana Water (phone)     |
| Lindsay Bearup, Reclamation      | Selso Villegas, Tohono O'odham (phone) |
| Melanie Alvarez, PAG             |  |

**1. Welcome and Introductions**

- Eve Halper, Reclamation, welcomed meeting attendees, Project Team members and sub-team members. Introductions were made.
- Kathy Chavez, Pima County requested for any questions or corrections to July 2019 project notes. No corrections were stated.

**2. Status of Groundwater Model (Eve Halper, Reclamation and Wally Wilson, Metro Water)**

*Target completion*

- January 2020 is the target completion date for all scenario runs to be completed by Brandon House (Reclamation).

*Mapping products*

- There are multiple proposed groundwater modeling products to help display and represent information obtained from groundwater modeling runs.
- These will consist of sets of maps accompanying with tables with absolute values for certain pieces of information.
- We are requesting both transient and static information to help us put changes into perspective and give greater context.
- Difficult to discuss entire study area (TAMA) as groundwater model does not cover entire study area.
- Interest in statutory considerations such as groundwater decline of over 4 feet per year and groundwater over 1,000 feet below ground surface (becomes legally “physically unavailable”).
- Have identified two specific periods of time: near future (2020-2049) and far future (2050-2079). We can compare changes between these time periods.

- Will end up with many maps, but hopefully they can be combined in a way that is not overwhelming. Ideally there will be no more than 2-3 depictions on single map product.
- Wally may need to dig into the details of the groundwater model with Brandon and Kip in order to understand limitations and context of groundwater modeling results.
- We will try to match color key to Tucson Water's color spectrum, although we will need to keep the color flood consistent across maps. We will connect with Michael Liberti to develop maps with a consistent color pattern.
- Comments:
  - Would be helpful to see rates of decline across the basin, displayed with a color flood map (e.g. 0-10). Could color 0-3.99 feet of decline in blue layers and everything above that rate could be shades of red.
  - Areas below threshold exempt wells are likely to go dry at current pumping depth; issues with ascertaining current pumping depth across an area;
  - Can we pair rate of decline with susceptible wells? The challenge is knowing the depth of susceptible wells.
  - Can we show depth to bedrock and 1000' threshold to identify areas at higher risk in addition to areas likely to exceed current pumping depth?
  - Need to give more thought as to how best represent areas of concern and risk using data available. How can we calculate and represent areas where wells are at risk of going dry? Need to identify data sources and groundwater modeling results that can be paired in a logical way.
  - Can the model distinguish areas where water available does not fulfill supply? Does it not serve the demand or does it pull the water from a different area?
  - What is potential resilience of exempt wells to drawdown?
  - Would be helpful to have maps displayed at 11'x17' with multiple maps with individual variables depicted in order to quickly visually compare results and identify trends or critical areas.
  - Could combine "areas susceptible to subsidence due to clays" map with levels of documented subsidence (available from USGS and ADWR) to understand areas that we want to avoid for expanded or new groundwater pumping.

*Anticipated groundwater model results:*

- Groundwater modeling results for worse case climate scenario with rapid, outward development pattern will be available in mid-October 2019. Results for the remaining five scenarios will be available in January 2020.

### **3. System Reliability Considerations and Metrics (Kathy Chavez, Pima County)**

- Kathy Chavez presented and discussed document detailing reliability considerations and metrics in the LSCR Basin. This effort aligns with portion of basin study that involves assessing risks to water systems, and vulnerability to being able to supply demand.
- Last month we discussed system reliability for long term physical water supply availability, reliability for sustaining and enhancing environmental quality, and reliability for sustaining cultural and recreational features.
  - Risks to surface water may come in the form of risks to CAP water, as well as intensity/runoff of stormwater. This will also need to be considered in the context of the Drought Contingency Plan, and strategies identified there to remediate risks to surface water. The 2007 Interim Guidelines for shortage are already built into CAP-SAM projections used in groundwater model.
  - Risks to groundwater include changes that may mobilize existing contaminant plumes.
  - Agricultural vulnerability can include changes to cropping patterns based on changes to ET and availability of water to ensure healthy crops.
  - We have also discussed how changes in water availability can influence dust storms, public health, etc.
- These vulnerabilities can be addressed via adaptive strategies.

#### **4. Adaptation Objectives (Eve Halper, Reclamation)**

- Eve Halper presented and discussed document with combined adaptation objectives for the Demand Sub Team and the Environmental Sub Team.
  - We would ultimately like to develop a cohesive list for which the entire Project Team is in agreement.
  - This list will serve as the criteria during the tradeoff analysis phase of the project.
- Adaptation objectives will also be discussed and put to the test in our Adaptation Strategies Workshop.
  - We want to assess both structural and non-structural adaptation strategies.
  - Suggestion to hold an initial workshop to develop adaptation strategies for worse case scenario (RCP 8.5; rapid, outward development) in November 2019 as groundwater modeling results will be available in October 2019 for the scenario.
  - Propose half-day workshop (9:30 am -3:30 pm) that includes lunch and professional facilitators. Strategies will be described using a consistent proposal form that will be distributed ahead of time.
  - Workshop will progress by reviewing adaptation objectives, then breaking up into small groups to brainstorm, then finishing with an initial screening process if time allows.

- Example information required presented on slides discussed by Eve Halper (e.g. sponsor, description, location, start and end date, impacts on pumping/recharge).
- Strategies can be both qualitative and quantitative, but we need to be specific in describing qualitative processes or we can get recommendations on how to incorporate more broad strategies into groundwater model (if possible).
- Groundwater model can accomplish “broad brush” reductions that incorporate Tucson Water’s current work looking at potential demand reductions through conservation.
- Comments:
  - Should we frame our results and adaptation strategies in terms of what is “likely” given that we are focusing on the worse case scenario first? We do not want to be alarmist or show that we are prioritizing harsher futures.
  - Goal of this project is not to develop a plan overall, but to be prepared for possible “worse” case scenarios. Therefore what is “most likely” is really not the focus of this study. That said, we will need to be very careful with communications about our results to avoid misinterpretation.

## **5. Tradeoff Analysis (Steve Piper, Reclamation)**

- Goal of a tradeoff analysis is to provide a transparent evaluation of adaptation strategies that can include a wide range of costs. Multiple objectives were defined in Steve Piper’s PowerPoint presentation that is also available for review.
- There are multiple perspectives in evaluating strategies, for example one can run into choice problems, sorting problems, and ordering problems that can confound evaluation of strategies. Therefore a basic framework to identify a solution based on a range of strategies is valuable.
- Some benefits and costs can be monetized while others cannot; therefore Reclamation uses the Principles, Requirements, and Guidelines (PR&G’s) that evaluate quantifiable/monetizable and non-quantifiable/non-monetizable impacts. This includes maximizing net public benefit.
- Basic steps in completing a tradeoff analysis/multi-criteria decision making include 1) the identification of outputs associated with each adaptation strategy, 2) quantification outputs associated with strategy (to extent possible), 3) the development of economic values for the identified outputs for each strategy, 4) the conversion of outputs into measures that can be compared, 5) the determination of relative importance of outputs, and 6) the completion of the tradeoff analysis.
- Environmental and social effects considered co-equal to economic and financial benefits.

- Simplified tradeoff examples were presented to guide attendees through processes used to normalize, weight, rank, and/or compare costs and benefits associated with multiple alternatives.
- **Comments**
  - Tradeoff analysis appears to be much more interactive with Reclamation technical staff than modeling efforts. Need to work closely to discuss measurement objectives. Additionally, ranking and weighting criteria is sourced from local partners.
  - We may not want to embark on weighting strategies, and may want to consider results in terms of equal importance.
  - We want to provide more general information to support a range of objectives, so we will need to pick areas more generally.
  - Quantities associated with different strategies will be developed by both local project team and assistance from Reclamation technical staff (e.g. economic effects).

## **6. Next Steps**

- Workshop dates to propose adaptation strategies will be determined via doodle poll (Nov 12, 14, or 21)
- Do we have a plan to structure workshop to maximize efficiency and outcomes of project?
- Support voiced to have a full day workshop for adaptation strategies to allow time for participants to build familiarity with the nature of groundwater modeling results and project proposal and evaluation.
- We could structure workshop to have multiple simultaneous sessions
- Need to seriously consider the actual data depicted in the map (e.g. average change, highest and lowest values, etc.)
  - May want to look at specific changes in terms of water accounting areas versus basin wide, etc.