

## SOLOMON WORKING GROUP MEETING NOTES

6:00 p.m. Wednesday, April 23

Rooks County Health Department, Stockton, Kansas

*Attendees: Ray Luhman (GMD4), Andy Lyon (DWR), Darci Paull (DWR), Diane Coe (KWO), Tina Alder (DWR), Jack Wergin (USBR), Bill Peck (USBR), Scott Voss (DWR), Dennis Lehman, Darla Jewell, Jim Circle, Kent Askren(KFB),Carolynn Nichols (WRAPS), Scott Ross (DWR), Pat Haffner. Robert Schiffner (NRCS), Steve Larson, (SSPA) and Alex Spiliotopoulos (SSPA) were in attendance via telephone.*

Darci opened the meeting by outlining the agenda explaining that the modeler, Steve Larson, would be joining the group via conference call and glance session to update the progress on the Solomon portion of the NWKS groundwater model. Tina interjected that the modelers are ready to receive scenarios for the model to run.

### Model Presentation

Steve Larson began by giving a history of the modeling process and how the NWKS and upper Solomon models came to be—as refinement of the existing model used in the Republican River Compact Agreement dispute between KS, CO and NE. He provided the group a PowerPoint presentation with visuals depicting the geographic location of the upper North Fork Solomon model domain as well as the upper South Fork model domain. Each of these were displayed to the group showing the integration of the NWKS model, which has a resolution or grid spacing, of one mile while the Solomon models have a resolution of 1/8 mile grid spacing.

He explained that the model calibration steps in the process and mentioned the key steps in the process. Recharge curves were developed for different soil types across the model domain, which were further modified by indicating either irrigated or non-irrigated lands. Precipitation curves were modified and calibrated to calculate recharge amounts and terrain multipliers were added spatially for further calibration.

Steve presented graphs, explained challenges and how they were dealt with regarding components of the water budget. As identified by Steve, components included in the water budget included; *storage, wells, river, ET, recharge and stream.*

He then reviewed the groundwater wells in each model domain that were used to calibrate the model. These visuals showed how closely the model was able to match measured water levels in the index wells. He provided a graph depicting the model residuals, showing that approximately 80% of the time the model would predict groundwater levels within five feet of the measured value for both the North and South Forks.

Steve concluded his presentation by indicating the models are now ready to be run and used as tools for water management decisions. He asked for any questions or comments.

Bill Peck asked how many separate years did the modelers use scaling factors to address wet years and also noted that many index well graphs show a decrease in recent history in baseflow/recharge wondering if these numbers were related to the drought. Steve responded that adjustments were made using scaling factors by year using the hydrographs and were done manually for the very wet years. Steve was not too concerned with the decline in baseflows as a result of drought conditions as the pumping occurs does not exceed what is accounted for by recharge in the total water budget.

### Working Group Discussion

After the modelers had finished answering questions, the group was asked to review a list of future model runs made in other parts of the state to brainstorm for model runs the Solomon. This sparked discussion and questions prior to suggestions for model runs. Many of the questions asked were answered by DWR staff. A brief synopsis of the questions and answers are as follows:

Q: Will these scenarios be the only ones developed or will there be a chance to modify/add to them in the future?

A: The plan is to continue to update and technically review the model to make future model runs.

Q: Is there much for incentive-based retirement programs in the area?

A: Not at this time.

Q: Does the model extend into the upper reaches/into GMD #4 boundaries?

A: Yes.

Q: What exactly does each of the water budget designations signify (*River, stream, wells, ET, etc...*)?

A: DWR will coordinate with Steve to define the water budget components as many in the group noted that it would be helpful to understand the numbers better and to aide in development of more model run suggestions.

Q: Is there a way to look at specific reaches, for example, an alluvial pumping density map?

A: It can be done, but has not yet to this point.

Q: Regarding soil types, is there a way to turn off pumping just in those areas with marginal soil types?

A: Yes, it is possible.

Q: What is the effort involved to run this model?

A: Once set up, the model can be run using the original model runs as a baseline and applying percentage adjustments.

Q: Will/can the model account for farming practices?

A: Although difficult to address, it does not directly account for it, but calibration factors or multipliers included could already be accounting for much of that. If farming practices change enough to become more of a factor, you will see it played out in the future model runs.

Over the course of this discussion, a list of seven model run scenarios was generated as follows:

- 1. Ogallala pumping & Alluvial pumping- manipulate so that one is on while the other is turned off and vice versa.**
- 2. Continued status quo pumping**
- 3. Turn off all pumping**
- 4. Adjust ET/lower to see the outcome of eliminating or reducing phreatophytes**
- 5. Turn off pumping in marginal soils**
- 6. Eliminate years with anomalously high precipitation from the model**
- 7. Incorporate an economic model into the existing North & South Fork models**

### Next meeting

Plans were to have the next meeting the same day as the next Solomon BAC meeting; July 16<sup>th</sup>. No time was officially decided, but will likely occur in mid to late afternoon.