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MEMORANDUM

TO: Joanne Chamberlain

FROM: Patrick Tara (INTERA), Silong Lu (Dynamic Solutions), Renee Murch (INTERA)

DATE: September 24, 2018

RE: MEETING MINUTES- SUMMARY OF WEKIVA BASINS SURFACE WATER MODELS PEER REVIEW KICKOFF MEETING

The kickoff meeting began in the Youth Camp facility at Wekiwa Springs State Park at 9am on September 26, 2018. Attendees are as noted on the District's sign-in sheets.

Introductions and Meeting Objectives

Joanne Chamberlain welcomed everyone and introduced herself. Attendees went around the room and introduced themselves. Peer reviewers are Patrick Tara from INTERA and Dr. Silong Lu from Dynamic Solutions. The purpose of today's meeting is to provide the peer reviewers and the public with an introduction to the models and an introduction to the watershed with a site tour.

Overview of Wekiva Basin MFLs

Andrew Sutherland provided an introductory overview, as summarized below:
MFLs are set as per FS 373.042 (1) and FAC 62.40.473.

A first priority is to identify relevant environmental values and then which are most sensitive.

Andrew presented a simplified grapfic of the MFL determination process. MFL determination and assessment is a result of a combination of hydrologic analysis, fieldwork, and the evaluation of water resource values (WRVs).

The District may use the models for both the determination and assessment steps for this system.

Once the MFL is determined, The District compares the current pumping condition to the MFL condition. The difference between them is the amount available for withdrawal (or sustainable yield or freeboard). If the current pumping condition is below the MFL condition, there is a deficit.

MFLs are developed with long periods of record because MFLs are long-term probabilities and this ensures that both the wet and dry conditions are protected.

Fatih Gordu introduced the Hydrological Analysis, as summarized below:
The analysis process includes:

1. Developing a dataset
2. A pumping Impact Assessment using ECFTX model,
3. Assessment of current-pumping condition flows/levels. This District is using HSPF and HEC-RAS in this case. Both are widely used. The District will develop no-pumping and current condition flows/levels using the models.
4. Establish the current status of MFLs by estimating the freeboard or deficit in the flows/levels under current pumping.
5. Determine the future status of MFLs by estimating the freeboard or deficit in the flows/levels under future pumping.

The models will be used to:

- Evaluate the effect of pumping on critical stage/flow/velocity profiles needed for WRVs.
- Determine stage-flow relationships for the evaluation of the effect of flow reduction.
- Assess current conditions.

Potential simulations include long-term simulations (50-60yr), scenarios (adjustment of spring flow boundary condition; spring flows are external time series in HEC-RAS; flow reduction simulations), no-pumping condition simulations, and current pumping condition simulations. Simulations will be run to determine the affect on velocity in stream and in-channel stage.

Overview of HSPF/ HEC-RAS Models

Choung-hyun Seong from the District introduced the models.

The model domain is 376 square mile basin consisting of the following waterbodies: Wekiva River, Little Wekiva River, Rock Springs Run and Black Water Creek. HSPF is used to calculate the runoff from the watershed. HEC-RAS is used to calculate velocity, stage, flows in waterbodies.

There are 4 nearby weather stations (Sanford, Lisbon, Deland, Orlando). Theissen polygons were used to determine the spatial variability of rainfall. The Hargreaves equation with adjusted GOES was used for PET.

Landuse is summarized in the presentation and consists primarily of: urban 27.7%, pasture 8.5%, agriculture 11.4%, and forest 24.3%. There are a total of 13 landuse classes.

Springs data obtained for 34 springs; Wekiwa Spring (average flow of 62 cubic feet per second and Rock Spring (average flow of 56 cubic feet per second) are the largest. Some observed springflows are results of statistical models; these are documented in the report and the appendix.

The HSPF modeling effort used with 3 sub-models- Blackwater creek (13 subwatersheds), Little Wekiva River Watershed (16 subwatersheds), Wekiva River watershed (15 subwatersheds), for a total of 44 subwatersheds.

The HSPF model was calibrated with PEST using 7 streamflow gauges as calibration targets with a calibration period of 2003-2016. Stations not used for calibration were used to test model performance. Calibration plots were shown including daily time series, monthly time series, flow-duration curves and scatter plots.

HEC-RAS was used to model the hydraulics of the Little Wekiva River, Rock Springs Run, and Wekiva River. The models consisted of 72 stream cross sections with internal boundary conditions using HSPF model results. The model was run in steady and unsteady state. A total of 8 stream gauges were used for calibration for the 2008 through 2016 period. Steady and unsteady state model results were presented. Statistics were also presented.

The presentation will be made available on the District's MFL webpage.

Stakeholder Comments

Patrick Tara (peer reviewer) asked for additional information on the ECFTX model and how it is incorporated into the model. Fatih answered that it is used to estimate changes in springflow due to changes in pumping. The modified springflows are used as boundary conditions to the model.

A stakeholder asked about historic water use. District staff responded that actual pumping data was used in the groundwater modeling effort. She also asked general questions regarding MFL development. Fatih, Andrew, and Joanne provided general responses.

The park ranger from Wekiva State park asked if they used any rainfall data from them because they have 4 rainfall monitoring stations nearby. The records are approximately 10 years long. Fatih answered that since they are only 10 years, they cannot be used for long-term simulation but the data are still useful for our purposes. District staff will contact them to obtain data.

A stakeholder asked a question about climate change. Fatih answered that there is significant uncertainty associated with climate change estimates, and MFLs have to rely on best available data. In this case, the historical data is the best available data.

A stakeholder asked if there were verification simulations performed to assess model performance. Fatih answered that the long-term simulations were considered verifications.

A stakeholder asked a question about ecology and fish habitat. Andrew provided information on ecological modeling and analysis with PHABSim.

Joanne said that the presentations will be posted on the SJR website's MFLs page under Wekiva. All content from today's meeting will be posted and more will be posted as we move through the peer review process.

Site Visit Overview and Tour

Prior to departure, Jane Mace from the District gave an overview of the site visits.

1. Wekiwa Springs at State Park
2. Wekiva River at Wekiva Island
3. Lower Wekiva River at Katie's Landing (driving by but not stopping)
4. Rock Springs at Kelly Park

Meeting Summary

After the site tours, attendees re-convened in a pavilion at Rock Springs. A meeting summary was collaboratively prepared by the peer reviewers.

The next meeting to present peer review initial findings was scheduled for October 23, 2018 at 9am at the District's Maitland Service Center. Notification will be posted on the District's MFL page.

Stakeholder Comments

Joanne opened the floor for additional stakeholder comments. No comments.

Meeting Adjourned

The meeting was adjourned by Joanne Chamberlain at 2:13pm.