TECHNICAL MEMORANDUM

DATE: March 31, 2025

FROM: Awes Karama, PhD
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Bureau of Groundwater Modeling and Assessment

SUBJECT: Responses to Peer Review Comments - Lake Prevatt HSPF Model

BACKGROUND

The SJRWMD's Minimum Flows and Levels (MFLs) Program, mandated by state water policy, is a District-wide effort to establish MFLs for priority lakes, streams and rivers, wetlands, springs, and groundwater aquifers. MFLs designate the minimum hydrologic conditions that must be maintained in these water resources to prevent significant harm resulting from permitted water withdrawals.

Lake Prevatt is located in Orange County, Florida, about two miles north of Apopka in Wekiva Springs State Park. Lake Prevatt has adopted MFLs, but a reevaluation was needed to determine whether the MFLs are met under current conditions. This reevaluation relies on the best available information, including updated model data and hydrological data, to ensure accuracy.

In 2022, the SJRWMD set up a Hydrological Simulation Program – FORTRAN (HSPF) model of the Lake Prevatt watershed to support the reevaluation process. Model calibration, validation, sensitivity analysis, long-term simulations, and a model report were completed in October 2023.

PEER REVIEW COMMENTS AND RESOLUTIONS

- **Data**
  - **A) Best available information**
    - *Comment 1. Sarker and others (2023) stated that the "area-weighted average of NEXRAD data was determined to provide the most accurate source for rainfall within the Prevatt watershed." SJRWMD may wish to quantify how this rainfall source is the most accurate, compared to other sources.*
      - Response 1.
        - Next Generation Weather Radar (NEXRAD) is a high-resolution distributed radar rainfall data. NEXRAD has the ability to characterize spatial and temporal variability of rainfall; capturing localized storms that point rain gages miss. Furthermore, at SJRWMD, NEXRAD data are calibrated and validated using rain gage data.
    - *Comment 2. SJRWMD used best available lake water-surface elevation measurements in Lake Prevatt to calibrate and verify the simulation. SJRWMD used measurements from 1995 to December 2020. In December 2023, Mr. Dan Schmutz, Vice President, Chief Environmental Scientist, Greenman-Pederson, Inc., obtained monthly Lake Prevatt water-surface elevation measurements from December 2020 to December 2023 from the Orange County Public Works Department. SJRWMD may wish to revise the simulation to include three additional years of lake water-surface elevation measurements for calibration or verification.*
      - Response 2.
        - At the onset of model development, the monthly data referenced were not yet available.
        - It is unlikely that the addition of these data would significantly alter the result. However, additional data will be considered in the next model update.
    - *Comment 3. In March 1997, Professional Engineering Consultants, Inc., published a stormwater management plan of the surface-water conveyance system that drains to Lake McCoy, Lake Coroni, and Lake Prevatt (**Figure 4**). Professional Engineering Consultants conducted the study for Orange County, the City of Apopka, and SJRWMD. Professional Engineering Consultants field verified the watershed boundary, measured geometry and elevation of stormwater conveyance infrastructure, and measured or estimated geometry and volume of stormwater retention and detention facilities. Professional Engineering Consultants simulated water-surface elevations at selected locations in the watershed, such as in lakes and stormwater retention facilities; and flow rates in selected surface-water conveyance features, such as culverts and channels. Professional Engineering Consultants simulated flows between Lake McCoy, Lake Coroni, and Lake Prevatt. Geosyntec Consultants attach Professional Engineering Consultants (1997a) to this technical memorandum. SJRWMD did not simulated flows from Lake Coroni to Lake Prevatt*

*(**Figure 2**). SJRWMD also did not simulate flows from Lake McCoy to Lake Coroni (**Figure 2**). SJRWMD may wish to re-delineate the watershed that drains to Lake Prevatt to include areas that drain to Lake McCoy (**Figure 5**) and Lake Coroni (**Figure 6**). This re-delineation will conform to observations made by Manager Brooks, that water from Lake Coroni periodically or episodically flows to Lake Prevatt from Lake Coroni. SJRWMD may wish to inform this re-delineation with Professional Engineering Consultants (1997a) and select environmental resource permits*

- Response 3.
    - Several statements made in the PEC (1997) report acknowledge that discharge into Prevatt is uncommon and only occurs (at very high stage) during extreme rain event.
        - (Section 2.5.4.6.9, pp 2-45) "According to lake level records, the water level in Lake Coroni varies considerably. At time, the lakebed is completely dry and is used as pasture land. During periods of heavy rainfall, the lake sits near the normal high-water level."
        - (Section 2.8.2, pp 2-90) "If Lake Coroni is below the overflow level, which is usually the case, Lake Prevatt may receive NONE of the discharged water."
        - (Section 2.8.3, pp 2-91) "The lake exhibits a significant groundwater recharge capacity … In fact, most of the runoff from areas upstream of Lake Coroni never reaches Lake Prevatt. Discharge from the lake occurs infrequently, only as a result of large storms."
    - In response to the review comment, we ran sensitivity scenarios that included estimated discharges from Lake Coroni. We calculated discharges northward into Lake Prevatt and added them to the model as daily time series inflows into the South Lobe. The development of the rating curve utilized stage and outflow values reported for four design storms (mean annual, 10-year, 25-year and 100-year 24-hour storms) in Table 2-4 of PEC (1997a). Two methods were used to estimate discharge northward into Prevatt. First, the computed discharges for these storms were used to create a rating curve that correlated the inflows with stage in the South Lobe. As a cross-check, we also created a second scenario where a hydraulic equation for the connecting circular culvert between the lakes was applied to estimate the flows, again based on the correlation of headwater and tailwater stages. The developed rating curve and circular culvert equation were then used to generate daily time series inflows based on the simulated water levels in the South Lobe. Figure 1 below compares the simulated lake levels exceedance probability curves with and without considering the inflows from Coroni. The flows from Lake Coroni affects only the highest peak water levels with an exceedance probability ≤ 5% in Prevatt. They are not expected to have an impact on the water

levels relevant to the proposed MFLs, which do not address such high stages. Therefore, re-delineating the watershed and re-modeling the headwater stages in Coroni was deemed not relevant for this project.

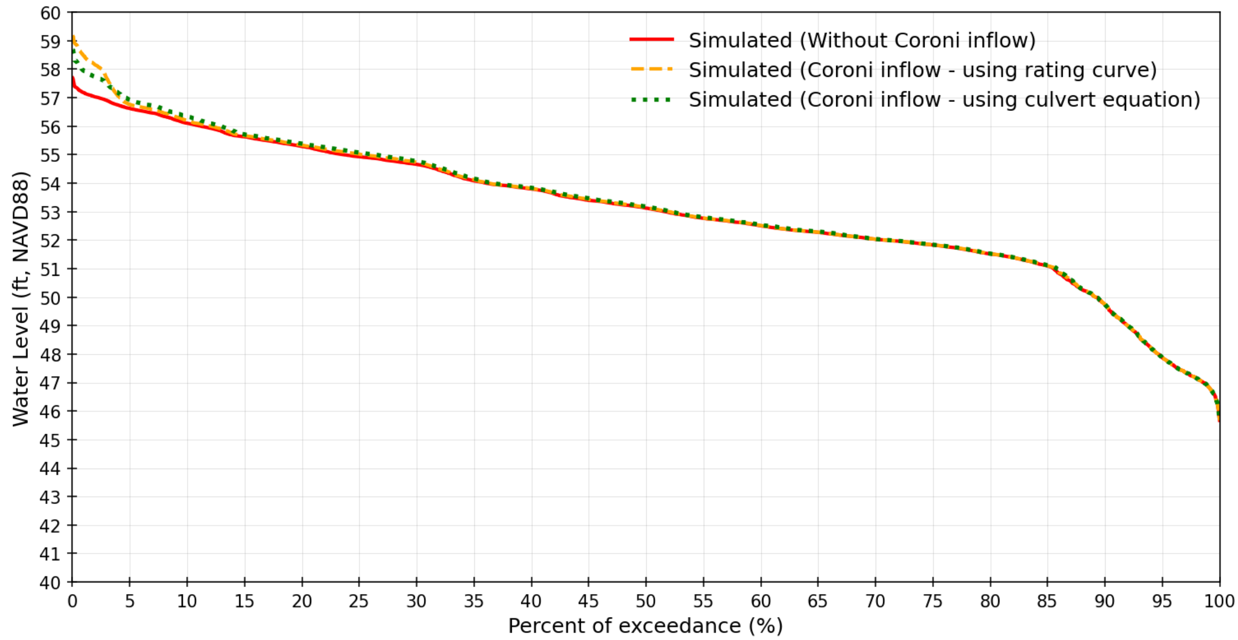

Figure 1. Impacts of Lake Coroni inflow to Lake Prevatt at South Lobe for the period from 2008 to 2020.

- *Comment 4. Lake Prevatt discharges to Carpenter Branch. Carpenter Branch flows to the north, to Mill Creek and Rock Springs Run. Professional Engineering Consultants (1997a, 1997b) simulated of water-surface elevations in Lake Coroni and Lake Prevatt. Professional Engineering Consultants (1997b) coded a 60-inch diameter round concrete pipe culvert as conveying surface water above elevation 58.78 feet above the unspecified Professional Engineering Consultants (1997b) project datum, from Lake Coroni under Paradise Isle Drive toward Lake Prevatt (Figure 7). The Lake Prevatt water-surface elevation must exceed both (i) 58.78 feet above the unspecified datum and (ii) the Lake Coroni water-surface elevation to force flow from Lake Prevatt to Lake Coroni. Intuitively, this condition is not likely to ever occur because the conveyance in Carpenter Branch, Mill Creek, and Rock Springs Run are likely sufficient to drain surface-waters in Lake Prevatt to the north, drawing the Lake Prevatt water-surface elevation down sufficiently to never satisfy both backflow conditions. However, during some episodic events, the water surface elevation in Lake Prevatt may be effectively equivalent to the water-surface elevation in Lake Coroni, and greater than 58.78 feet above the unspecified datum, such that Lake Coroni and Lake Prevatt are hydrostatically connected through the 60-inch-diameter pipe, but water does not flow from Lake Coroni to Lake Prevatt or from Lake Prevatt to Lake Coroni. SJRWMD may wish to revise the simulation described in Sarker and others (2023) to allow for the possibility that surface water will flow from Lake Prevatt to Lake Coroni.*

- Response 4.
    - We agree that the conditions necessary to force flow from Lake Prevatt to Lake Coroni are “not likely to ever occur.” If these were to occur, surface outflow to the north via Carpenter Branch would dominate due to a lower invert and tailwater conditions. Therefore, the rate of drop in Prevatt stage down towards its outlet invert would barely be affected and would affect MFL-relevant stages even less so.

- *Comment 5. Stormwater management systems exist in the Lake Prevatt watershed, which detain or retain stormwater (**Figure 8**) from the watershed to Lake Prevatt. Natural ponds also exist in the Lake Prevatt watershed. These ponds likely retain or detain surface-water flows from the watershed to Lake Prevatt. SJRWMD may wish to revise the simulation to include constructed stormwater management systems and natural ponds, to quantify detention or retention of surface-water flow to Lake Prevatt.*
    - Response 5.
        - In response to this review comment, we ran a sensitivity scenario to increase the detention and retention storage in the watershed. It was done by routing surface runoff from urban lands to the water PERLND segments in the HSPF model, which can act as a detention storage. We also increased the storage depth of wetlands by 17 inches to provide additional potential storage. Figure 2 below compares the simulated lake levels with observed lake levels exceedance probability curves for Prevatt South Lobe. The figure indicates that considering the detention storage could reduce the overestimation of observed lake levels for some low stages in the 70-90 percent exceedance range but increases them noticeably for higher exceedances. At the same time, the medium- to high-level observed water levels are clearly underestimated, and we felt it unlikely that recalibrating the model to raise the medium to high range would resolve the issue any better. As it stands, the model parameters for the uplands implicitly account for the impact of detention on the overall runoff, and we feel that this is sufficient for the purpose of the model.

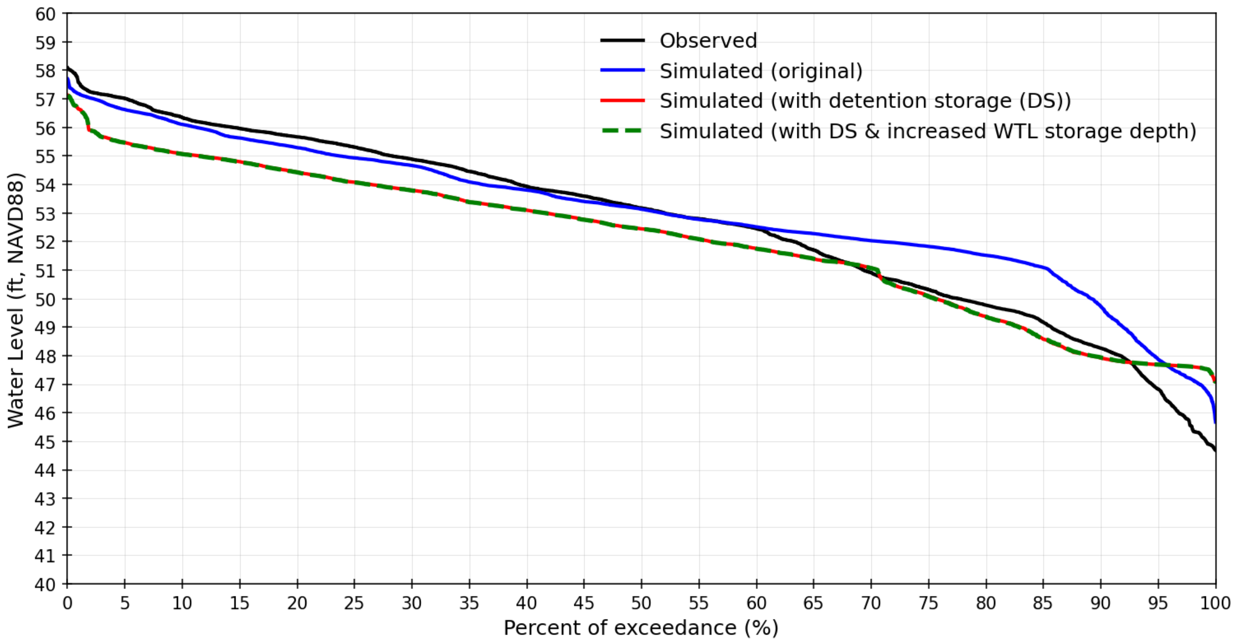

Figure 2. Impacts of detention storage (DS) and wetland (WTL) storage depth on simulated water levels exceedance probability curves of Lake Prevatt South Lobe for the period from 2008 to 2020.

- **B) Information deficiencies**
  - *Comment 6. All necessary information is available to develop, calibrate, and verify the simulation.*
    - Response 6.
      - None.
- **C) Discarded information**
  - *Comment 7. Measured water-surface elevations in Lake Prevatt were available from December 2020 to December 2023 (comment 1). Sarker and others (2023) did not incorporate measured water-surface elevation in Lake Prevatt during this period, into calibration or validation elevation time series. One logical, reasonable explanation is that December 2020 was a practical, recent, end of the measured water-surface elevation time series used for calibration and validation. If SJRWMD choose to revise the simulation described in Sarker and others (2023), and with this luxury of additional time to refine the simulation, SJRWMD may wish to extend the calibration or validation time series with additional elevation measurements.*
    - Response 7.
      - See the response to Comment 2 above.
  - *Comment 8. Sarker and others (2023) did not use Professional Engineering Consultants (1997a) stormwater management plan to inform watershed delineation or to simulate stormwater detention, retention, or conveyance systems (comment 3). Sarker and others (2023) did not explicitly acknowledge awareness of Professional Engineering Consultants (1997a) or explicitly reject Professional Engineering. Consultants (1997a). SJRWMD may wish to use Professional Engineering Consultants (1997a) stormwater management plan to inform watershed delineation or to*

simulate the influence of stormwater detention, retention, or conveyance systems on surface-water flows to Lake Prevatt and water-surface elevations in Lake Prevatt.

- Response 8.
    - The District used the most up to date GIS data available for delineation. In addition, the delineated watershed and sub-watersheds were field verified.

- *Comment 9. Sarker and others (2023) did not cite technical support information or calculations from environmental resource permits as references for watershed delineation or to simulate stormwater detention, retention, or conveyance systems (comment 3). Sarker and others (2023) did not explicitly acknowledge awareness of technical information associated with environmental resource permits, or explicitly reject this information. SJRWMD may wish to use permits as references for watershed delineation or to simulate the influence of stormwater detention, retention, or conveyance systems on surface-water flows to Lake Prevatt and water-surface elevations in Lake Prevatt.*
    - Response 9.
        - The detailed information on stormwater retention and detention storage and conveyance that is typically found in ERP permits would be necessary for a stormwater system study such as PEC (1997a); however, it is not necessary for estimating the runoff volumes to the lake in a long-term continuous model focused on stages in the lake itself.

- **D) Effect of Discarded Information on Results**
    - *Comment 10. SJRWMD may wish to revise the simulation described in Sarker and others (2023) to include surface-water conveyance infrastructure, stormwater detention infrastructure, stormwater retention infrastructure in areas that drain to Lake Prevatt (comment 5, **Figure 8**). Sarker and others (2023) quantified measured and simulated, Lake Prevatt south lobe water-surface elevation exceedance probability (**Figure 9**). For example, Sarker and others (2023) show that a measured 48-foot water-surface elevation above the North American Vertical Datum of 1988 (NAVD88) has a 90-percent chance of being exceeded from 2008 to 2021. Sarker and others (2023) show that the simulated water surface elevation is as much as two feet greater than the measured water surface elevation, along the relatively lower-elevation, drier side of the elevation-probability relationship. Restated: the simulation is wetter than measurements, during relatively lower stages, less than about 52 feet above NAVD88. Consequently—with the simulation described in Sarker and others (2023)—SJRWMD propose to inform a specified, regulatory, minimum lake level with a tool that is wetter than the actual lake level, at the same exceedance probability. Suggests that the oversimulation of South Lobe low stages is due to lack of R/D storage.*
        - Response 10.
            - See response to Comment 5.

        - Much of the lake inflow would be baseflow, which could be flowing underneath the retention/detention storage rather than being captured by them.
        - The majority of the storage is in the North Lobe drainage, which does not have this oversimulation at the low end. Any impact on the South Lobe would be much less. Attempting further adjustments to increase the impact of retention/detention storage overall would likely worsen the fit in the North Lobe, where the data is directly observed, more than it would improve it in the South Lobe, where the oversimulation is relative to the less-certain extended data.
    - *Comment 11. Sarker and others (2023) did not delineate wetland west of Tanglewood Lane, a wetland west of Jolly Avenue, and a wetland south of Welch Road East between Rock Springs Road and Ustler Road as draining to Lake Prevatt. Professional Engineering Consultants (1997a) delineated (**Figure 11**) wetland west of Tanglewood Lane (basin LP01), a wetland west of Jolly Avenue (basin LP01), and a wetland south of Welch Road East between Rock Springs Road and Ustler Road (basins MN13, LP08, and LP12) as draining to Lake Prevatt. SJRWMD may wish to re-delineate and refine sub-watersheds to include these areas as draining to Lake Prevatt, and revise the simulation described in Sarker and others (2023) accordingly.*
      - Response 11.
        - We performed and field-checked our own delineation without assuming that a 25-year-old study was still current, as drainage works can change over time.
    - *Comment 12. Sarker and others (2023) did not delineate areas that drain to Lake Coroni or Lake McCoy as periodically draining to Lake Prevatt, during, for example, rare, episodic events with annual exceedance probabilities greater than, say, 30 percent. Professional Engineering Consultants (1997a) delineated (**Figure 11**) areas that drain to Lake Coroni and Lake McCoy as draining to Lake Prevatt (**Figure 4**). If SJRWMD make this revision the simulated exceedance probability relationship may change (**Figure 12**).*
      - Response 12.
        - See the responses to Comments 3 and 4.
- **Simulation**
  - **E) Development**
    - *Comment 13. SJRWMD used measured groundwater elevations as the bottom boundary condition in the HSPF simulation. SJRWMD plan to use simulated Upper Floridan aquifer potentiometric surface elevations from the ECFTx model (Gordu and others, 2022) as the bottom boundary condition for MFL determination. SJRWMD plan to force ECFTx with pumping scenarios, to develop a minimum lake level for Lake Prevatt. Sarker and others (2023) did not dynamically link the Lake Prevatt HSPF simulation to ECFTx. Sarker and others (2023) did not determine whether measured groundwater elevations near Lake Prevatt match simulated potentiometric surface elevations in ECFTx. In preparation for a Lake Prevatt MFL, SJRWMD may wish to consider whether simulated potentiometric surface elevations*

in ECFTx match measured potentiometric surface elevations at well ORO893, which taps the Upper Florida aquifer system beneath Lake Prevatt. If simulated potentiometric surface elevations in ECFTx do not match well, measured potentiometric surface elevations at well ORO893, some difference may exist between simulated, contemporary Lake Prevatt water-surface elevation and simulated, no-pumping Lake Prevatt water-surface elevation that is attributed to differences between measured potentiometric surface elevations at well ORO893 and simulated potentiometric surface elevations at well ORO893. SJRWMD may wish to re-tune ECFTx to improve the fit between simulated and measured potentiometric surface elevations at well ORO893, to eliminate or minimize error associated with replacing the measured bottom boundary condition with a simulated bottom boundary condition. This refinement in ECFTx may be critical to correctly and appropriately interpreting the effect of pumping on lake level.

- Response 13.
  - The plan for using ECFTx for evaluating the MFLs is not to use the groundwater model results directly but to compute the increase or decrease in UFA head under the lake relative to historic conditions. These deltas are then applied to the measured well data. This process is part of the MFLs development rather than the model development, and can be discussed further in that peer review process.

- *Comment 14. Leakance is the quotient of hydraulic conductivity and hydrogeologic unit thickness. Leakance parameterizes the benthic recharge flux of water from a perched lake to an underlying hydrogeologic unit or aquifer system. More water flows to a hydrogeologic unit through a lakebed with a relatively greater leakance than through a lakebed with a relatively lesser leakance, forced by the same hydraulic gradient between the lake and aquifer. Sarker and others (2023) found that the simulation of Lake Prevatt water-surface elevation is most sensitive to (a) leakance between Lake Prevatt and the Floridan aquifer system and (b) a lower zone evapotranspiration parameter. SJRWMD may wish to determine whether the hydraulic gradient between Lake Prevatt and surrounding water bodies—such as Lake Coroni, Lake McCoy, and wetlands in Wekiva Springs State Park—force groundwater flow to or from Lake Prevatt. Given the sensitivity of simulated Lake Prevatt water-surface elevation to leakance, SJRWMD may wish to accurately simulate hydraulic gradients to and from Lake Prevatt, which are both a function of potentiometric surface elevation in water bodies near Lake Prevatt.*
  - Response 14.
    - The local UFA well already accounts for any impacts to UFA head under the lake from surrounding water bodies. Given the flat topography in the area, the horizontal distance to nearby water bodies makes it unlikely that significant horizontal flow through the surficial aquifer reaches the lake from outside of its modeled watershed.

- *Comment 15. Sarker and others (2023) stated that "calibrated parameter values from the Middle St. Johns River Basin (MSJRB) HSPF model were used as a starting point for our calibration of the Prevatt model." Sarker and others (2023) did not tabulate calibrated parameter values from the Middle St. Johns River Basin HSPF model, or calibrated parameter values from other studies with geographic, or hydrologic relevance, such as ECFTx (Gordu and others, 2022) and North Florida Southeast Georgia groundwater model (NFSEG) (Durden and others, 2019). SJRWMD may wish to justify Lake Prevatt simulated parameter values by comparing these values to other studies with geographic, or hydrologic relevance, such as ECFTx and NFSEG. For example, the southeastern side of the NFSEG simulation domain is about ten miles northwest of Lake Prevatt. SJRWMD and SRWMD simulated water-surface elevations in lakes in the Ocala National Forest—in the southeastern part of the NFSEG simulation domain—with a dynamic link between HSPF and MODFLOW. Simulated leakance between these lakes in the Ocala National Forest and the surficial aquifer may inform simulated leakance in Lake Prevatt.*
    - Response 15.
        - The final calibrated hydrology parameters in many cases were varied significantly from the MSJRB model due to a great difference in scale where the MSJRB parameters are effectively averaged over a much large area, so a comparison with its parameters is not relevant.
        - For the groundwater models listed for comparison of hydrology parameters, only the lakebed leakance parameter is directly comparable to the HSPF model parameterization.
        - Again, difference in scale can result in relatively large localized spatial variability in a karst environment, so the calibrated leakance value in the HSPF may vary from those in the ECFTx or NFSEG MODFLOW models.
- *Comment 16. Sarker and others (2023) stated that an "extended South Lobe timeseries was generally lower than the North Lobe data, even at North Lobe stages above 51 ft, where the two should be connected. The difference in average stage was generally about 1 foot. Therefore, we further adjusted the overall extended South Lobe data upward by 1 ft." This ad-hoc adjustment is not ideal. Precision in elevation measurement is important. SJRWMD may wish to precisely survey the elevation of active and historic water-surface elevation measurement devices in both Lake Prevatt south lobe and Lake Prevatt north lobe, and to precisely survey the elevation of the natural weir that connects the north lobe and the south lobe. SJRWMD may wish to document these surveys in reports that support MFL development. A precise understanding of device and weir elevations may be necessary to best extend the south lobe time series. The moment at which SJRWMD measure an elevation is important. SJRWMD may wish to consider south lobe time series extension by considering whether correlation should only be done at moments in which water surface elevation was synoptically measured in both the south lobe and north lobe, and at elevations greater than the interconnecting weir elevation.*

SJRWMD may introduce unnecessary inaccuracies if water-surface elevation measurements greater than the weir elevation and at different moments are compared, with an expectation that these elevations be equivalent. If either water-surface elevation is less than the weir elevation, the elevations may not be expected to be equivalent, as water is flowing from one lobe to the other lobe. If both water-surface elevations are greater than the weir elevation, but were not measured at the same moment, the elevations may not be equivalent, as inflows or outflows may have caused one water-surface elevation to change, over the duration between the non-synoptic measurements. The one-foot upward adjustment is not precisely documented. SJRWMD may wish to clarify and document whether the one-foot difference in average stage between the north lobe and south lobe water-surface elevations includes measurements both above and below the weir elevation, or only includes moments when the measured water-surface elevation in both lobes was above the weir elevation. SJRWMD may wish to clarify and document whether measurements were synoptic. SJRWMD may wish to report the difference to the nearest 0.1 foot, or the nearest 0.01 foot; reporting the difference to the whole foot is less precise.

- Response 16.
  - While we agree that the 1-foot adjustment is not ideal, this was the best available approach due to limited stage data on the South Lobe.
  - When the lobes become connected, the stages equalize quickly enough that the daily mean stages are not significantly impacted by the rate of exchange, given the small volumes in the lake and the size of the connection.

- *Comment 17. Sarker and others (2023, figure 9) correlated (a) measured Lake Prevatt south lobe water-surface elevation and measured potentiometric surface elevation in well ORO984 and (b) measured Lake Prevatt north lobe water-surface elevation and measured potentiometric surface elevation in well ORO984. Sarker and others (2023) show that the south lobe correlation is linear, based on a relatively shorter period of record than was used in the north lobe correlation. Sarker and others (2023) suggest that the north lobe correlation is linear, based on a relatively longer period of record than used in the south lobe correlation; however, the north lobe time series appears to have two distinct regions: one region at north lobe water-surface elevations greater than about 52.5 feet above NAVD88 and another region at north lobe water-surface elevations less than about 52.5 feet above NAVD88. SJRWMD may wish to explain the relevance of these two regions. SJRWMD may wish to explain why the relationship is apparently linear with a 0.5 positive slope (rise 4 ft over 54 to 58 y-domain; run 8 feet over 50 to 58 x-domain) in the region greater than about 52.5 feet above NAVD88 and non-linear in the region less than about 52.5 feet above NAVD88. SJRWMD may wish to consider whether two relationships should be defined, one greater than 52.5 and one less than 52.5.*
  - Response 17.

        - While the South Lobe correlation was used in the model development, the North Lobe correlation was not used and was therefore deleted from Figure 9 in the updated report. Figure 9 now shows only the South Lobe correlation.
- Comment 18. Sarker and others (2023) globally reference elevation datum, stating that "all elevation data in this report, whether groundwater (GW) levels, lake levels, or topography, are in feet above the North American Vertical Datum (NAVD), 1988." Sarker and others (2023) explicitly referenced NAVD88 twice. SJRWMD do not explicitly reference datum in figures or tables. Sarker and others (2023) do not reference NAVD88, or datum, in simulation input files. Although the global statement minimally suffices, SJRWMD may improve simulation input files and simulation documentation by explicitly citing NAVD88 throughout input files, documentation, in tables, and on figures. This may be particularly important in model input files, where the generic statement in the report may not effectively communicate datum to some subsequent users of the model. Some readers consider figures and tables to be independent elements that do not rely on statements or context from the associated report text, such that datum should be explicitly stated on all figures and in all tables. For absolute clarity, SJRWMD may wish to explicitly site datum wherever elevation is cited. SJRWMD may wish to not rely on a global reference statement.
    - Response 18.
        - The report now has the datum specified in all tables and figure captions. A comment has also been added to the model input files for all scenarios specifying that all elevations are in feet NAVD88.
- *Comment 19. SJRWMD may wish to document surveyor, survey dates, publication dates, survey methods, survey owner, resolution, reference publication, and other relevant metadata for specific, important simulation inputs, including but not limited to the NRCS soils survey, the digital elevation model, bathymetric elevations, and structural dimensions and elevations of water control structures, such as culverts and drop structures.*
    - Response 19.
        - There is a reference for the topobathymetry DEM development cited in the report.
        - The data sources named for the DEM and soils are standard sources whose metadata are publicly available.
        - There is no outlet control structure for the lake itself, only a natural channel with its bed elevation defined in the bathymetry.
        - Explicit representation of small water control structures such as road culverts was not necessary for this study.
- *Comment 20. Sarker and others (2023) stated that the "lake edge was defined by a combination of these data and heads-up digitization of aerial photography taken in 1984 and 2014-2017." SJRWMD may wish to further detail "heads-up" digitization. Some future readers of this report may not be explicitly familiar with "heads-up digitization."*

- Response 20.
    - The report has been altered to say “manual digitization of the lake boundary” to avoid the informal term “heads-up”.

- *Comment 21. Sarker and others (2023) stated that “site visits were done to verify the watershed boundary as well as the structure's location and the lake's discharge point.” SJRWMD may wish to revise the report to further detail the structure at the lake’s discharge. Is this structure a culvert? If yes, what is the size of the culvert? From what material is the culvert constructed? What elevation above NAVD88 are the inverts for this culvert? Was the culvert ever overtopped during the period of record? If yes, at what elevation does the culvert overtop? If yes, what are the dimensions of the overland flow weir that convey surface water over the culvert, to a region downstream of the culvert?*
    - Response 21.
        - There is no discharge structure, only a natural channel with its bed elevation defined in the bathymetry. The report has been corrected.
- *Comment 22. Sarker and others (2023) stated that “stage-flow relationships for each lobe were derived from an Interconnected Channel and Pond Routing (ICPR v4) model.” SJRWMD did not provide this model, for review. SJRWMD may wish to revise the report to tabulate the ICPR4 model inputs and plot the stage-flow relationship.*
    - Response 22.
        - The simple ICPR model used for the lake outlet is now briefly described in the updated report, and the resulting rating curve is shown.
- *Comment 23. Sarker and others (2023, figure 15 and figure 16) plotted stage area relationships for Lake Prevatt north lobe and south lobe. Sarker and others (2023) show that 40 acres are inundated by a water-surface elevation about 59 feet above NAVD88 in the north lobe and that 40 acres are also inundated by a water-surface elevation about 69 feet above NADV88 in the north lobe; such that—conceptually—a vertical wall exists around the north lobe, in which increases in water surface elevation from about 59 feet above NAVD88 to about 69 feet above NAVD88 do not result in more area inundated. Intuitively, this does not seem possible; the SJRWMD topographic-bathymetric DEM conflict with this uniform, prismatic relationship. Sarker and others (2023) show a similar, prismatic relationship in the south lobe. Sarker and others (2023, figures 17 and 19) do not simulate a water surface elevation greater than 59 feet above NAVD88, such that the relationship between 59 feet and 69 feet is computationally irrelevant. SJRWMD may wish to revise the report, simulation, and attachment 1 to reflect a stage-area relationship with a maximum stage of 59 feet above NAVD88, or to reflect a stage-area relationship in which area increases accurately with increasing stage, to whatever elevation SJRWMD choose to specify as the maximum stage in the relationship.*
    - Response 23.

        - The stage-area table was unnecessarily extended beyond what is used in the model. The portion used in the model does not have the "glass wall" in the stage-area curve. Figures 15 and 16 in the report have been corrected to reflect the actual model input, as has been the table in the Attachments.
  - Comment 24. Sarker and others (2023) stated that "the area of the surrounding wetland is expected to fluctuate. This variation in areal coverage of the wetlands was simulated in the model through HSPF's Special Actions." SJRWMD may wish to further describe this fluctuation, to characterize this fluctuation with maps and plots, and to further describe the special action.
    - Response 24.
      - The variable lake surface area methodology is described in the HSPF Common Logic document, which is the reference cited in that paragraph as "Jobes, 2022".
  - *Comment 25. In a December 26 email to SJRWMD, Mr. Dan Schmutz, Vice President, Chief Environmental Scientist, Greenman-Pederson, Inc., asked whether leakance in Lake Prevatt changed over the period of record, or whether leakance has not changed over the period of record. SJRWMD may wish to revise the report to discuss whether land use changes in the watershed may have caused leakance to change over time. SJRWMD may wish to determine whether lakebed thickness was measured at different moments in the period of record, from which a transient leakance might be postulated. If two lakebed thickness are available at different dates, SJRWMD may wish to parameterize leakance as changing, as a function of the rate at which the lakebed thickness changed, between the two dates of known lakebed thickness.*
    - Response 25.
      - The leakance is a calibrated parameter in the model. The model does not change leakance over period of record. It does not base the leakance parameter on lakebed thickness, but if data was available, we could use it. In the absence of such data, assuming a constant leakance is the best available parameter.
- **F) Calibration**
  - *Comment 26. In a December 26 email to SJRWMD, Mr. Dan Schmutz, Vice President, Chief Environmental Scientist, Greenman-Pederson, Inc., asked whether SJRWMD incorporated sampling density into calibration, particularly with respect to calibration metrics. Sarker and others (2023) do not discuss non-uniform calibration weights, in which measurements during periods of sparse measurement resolution are weighed more than measurements during periods of dense measurement resolution. For example, consider 12 water-surface elevation measurements, made one per month, in 1975; and 35,040 water-surface elevation measurements, made once every 15 minutes, in 2019. If simulated water-surface elevation were compared to these 35,052 measurements, in which each measurement is weighed equally, the comparison would collectively devalue measurements in 1975 due to the relatively sparser measurement resolution (one measurement every month) compared to 2019*

(one measurement every 15 minutes). If simulated water-surface elevation were compared to these 35,052 measurements, in which each measurement in 1975 is weighed 2,920 more than each measurement in 2019, the comparison would value equally the 12 measurements in 1975 and the 35,040 measurements in 2019. SJRWMD may wish to specify whether measurements used for calibration or validation in periods of relatively sparser measurement resolution are weighed equally to measurements used for calibration or validation in periods of relatively denser measurement resolution. SJRWMD may wish to weigh measurements used for calibration or validation such that measurement resolution does not devalue measurements in periods of relatively sparser measurement resolution.

- Response 26.
    - As is stated in the report, the model is calibrated to daily average stage, not 15-minute data, as implied by the comment.
    - The year 1975 is well before the calibration and validation periods, and is therefore not relevant.
    - Apart from a couple of gaps, there isn't a time of temporally sparse data during the calibration period. The observations in the North Lobe in the validation period were monthly prior to 2004. However simply weighting them by the number of days in the month, as apparently suggested in the comment, is not a standard approach in our experience. The value of one monthly sample does not have the same information content as 30 daily points, and should be weighted as if it were, in our judgement. The most obvious alternative would be to compare monthly observed (single points before 2004 and monthly average afterwards) against monthly average simulated values. However in our judgement this approach would lose too much information regarding the rise and fall of lake stage at shorter intervals, which can be significant in such a small lake.

- *Comment 27. SJRWMD measured lake water-surface elevation and groundwater potentiometric surface elevation with water-surface elevation measurement devices. Water-surface elevation measurement devices from the late 1990s are not significantly less reliable than devices used in the late 2010s. However, if SJRWMD wish to weigh measurements from the late 1990s differently than more recent measurements, due to a belief that older measurements are less accurate or less reliable, SJRWMD may wish to revise the report to document this belief, and the approach to developing non-uniform weights. SJRWMD may then wish to weigh measurements used for calibration or validation such that measurement device reliability favors more reliable measurements and discounts less reliable measurements*.
    - Response 27.
        - The study does not assume that older measurements are less accurate or reliable than newer ones, nor does the report imply this.

They are simply less frequent. See the previous response for our discussion of weighting less frequent values.

- *Comment 28. During the task A watershed visit on December 11 (King, 2023), Wekiva Springs State Park Manager Robert Brooks asserted that Lake Prevatt has dried during relatively dry periods. SJRWMD may wish to show that the simulated water-surface elevation in Lake Prevatt dries completely, during episodic drought conditions, as anecdotally suggested by Manager Brooks. SJRWMD may wish to quantify the number of times that Lake Prevatt dries during the simulation, the number of times the time series of measured water-surface elevation documents that Lake Prevatt dried, during the period of record, and the measured frequency in which Lake Prevatt dries.*
  - Response 28.
    - Due to the relatively heavy emergent vegetation, even near the centers of the lobes, it may have been difficult for the park manager to accurately determine if there remained standing water during the times he mentioned. It was not stated whether he was observing from the bank or walking out into the dry portions of the lake bed.
    - Throughout the calibration period, the lowest observed stages are well matched by the model. Even on days where the lake was too low for the sensor to report a stage, field notes for manual observations generally report some water in the lake, even when the stilling well and staff gage are dry. Therefore we believe that the model is still capturing these extreme low stages at times when the lake appears dry.
- *Comment 29. During the task A watershed visit on December 11 (King, 2023), Wekiva Springs State Park Manager Robert Brooks asserted that during or soon after rainfall events associated with 2010s and 2020s era hurricanes and tropical depressions, the maximum pond stage in response to this episodic discharge inundates the pond adjacent to the park manger's residence to a point that is equidistant between the normal pond shoreline and the park manager's residence. SJRWMD may wish to show that the simulated water-surface elevation periodically or episodically achieves this elevation, as anecdotally suggested by Manager Brooks. SJRWMD may wish to quantify the number of times that water in Lake Coroni flowed through the culvert under Paradise Isle Drive during the simulation, and the frequency with which water flows through the Paradise Isle Drive culvert. SJRWMD may wish to quantify the number of times that water in the pond near Manager Brooks' residence flowed to Lake Prevatt during the simulation, and the frequency with which water flows from this pond to Lake Prevatt.*
  - Response 29.
    - Our assessment is that this small pond next to the manager's residence is too small to materially affect stages in the lake, so it is not represented in the model.

- As discussed in our response to Comment 3, the occasional high-stage inflows from Coroni are not judged to be relevant to this MFL study.
- We have no data to confirm that the high stages in the small pond were matched by the lake stage. The pond may have been higher than the lake in these times.

- **G) Validation**
  - *Comment 30. Sarker and others (2023) declined to validate the simulated Lake Prevatt south lobe water-surface elevation because SJRWMD (or some other entity) did not measure water-surface elevation in the south lobe during the validation period. In a December 26 email to SJRWMD, Mr. Dan Schmutz, Vice President, Chief Environmental Scientist, Greenman-Pederson, Inc., asked whether "relatively higher uncertainties about the water level data quality for the south lobe" result in "concerns about the quality of the inferences obtained with respect to the south lobe." SJRWMD may wish to justify the quality of the extended Lake Prevatt south lobe water-surface elevation and then validate the simulation to this extended time series.*
    - Response 30.
      - Although there is some additional uncertainty due to the use of the extended data in the South Lobe, our judgement is that it is still the best information available for evaluating the model performance, which is our primary criterion. The model does simulate stages in the right range for the low grab samples in late 2011 during a dry period when the two lobes were separated. Future reassessments of the MFLs for this lake will use the best data available at that time.
- **H) Results**
  - *Comment 31. In the December 11 kickoff meeting, I asked whether Lake Prevatt meteorological forcing is statistically stationary. SJRWMD responded that (i) the historic record reflects relatively wet periods and relatively dry periods; and that acceptable simulation during these relatively drier and relatively wetter periods justifies the performance of the simulation; (ii) downscaling global climate models is challenging and difficult to deploy at the Lake Prevatt scale; (iii) SJRWMD does not know whether the future climate in central Florida will be wetter or drier; and (iv) SJRWMD uses adaptive management to periodically revisit water management decisions relative to non-stationarity in meteorological forcing, such that the SJRWMD may adjust management in the future, based on future changes in meteorology. In a December 26 email to SJRWMD, Mr. Dan Schmutz, Vice President, Chief Environmental Scientist, Greenman-Pederson, Inc., noted that a downward trend appears to exist in the potential evapotranspiration time series at Lisbon. In the January 16 workshop, during which I presented initial comments, I shared a plot of dry quarter and wet quarter rainfall depth for Orlando, from 1892 to 2023 (**Figure 17**). Strictly, these plots are not a rigorous examination of non-stationarity in meteorological forcing. However, visual inspection of these plots suggests that the historical variation in rainfall during the wet quarter appears to be stationary; and*

*the historical variation in rainfall during the dry quarter also appears to be stationary. Also noteworthy, perhaps, although a positive trend may be apparent in the wet quarter from about 1975 to 2024, a positive trend is not present in the wet quarter over the full period of record, from about 1890 to 2024. Regardless of SJRWMD's use of adaptive management and regardless of downscaling challenges associated with use of global-climate models at a regional scale, SJRWMD may wish to scientifically determine whether Lake Prevatt meteorological forcing is statistically stationary or statistically non-stationary. SJRWMD may wish to use a more rigorous examination than simply plotting measurements, as I have done in **Figure 17**.*

- Response 31.
  - The magnitude of any trend in this particular dataset appears to be small. Our practice is to let future reassessments of the MFLs capture any effect of nonstationarity on MFL compliance.

▪ *Comment 32. Sarker and others (2023) used a one hour computational time step. Maximum flow rate from the Lake Prevatt south lobe to the north lobe was about 60 cubic feet per second, calculated at a one hour resolution, for one hour in late 2017 (**Figure 15**). Integrated over one day, this maximum reduces to less than 2.5 cubic feet per second (**Figure 14**). Maximum flow rate from the Lake Prevatt north lobe to the south lobe was about 200 cubic feet per second, calculated at a one hour resolution, for one hour in 2008 (**Figure 15**). Integrated over one day, this maximum reduces to about 35 cubic feet per second (**Figure 14**). Both the 60 cubic foot per second flow rate from the south lobe to the north lobe and the 200 cubic) shows that stage differences of tenths of one foot force hourly flow rates of hundreds of cubic feet per second. SJRWMD may wish to reduce the computational time step from one hour to, perhaps, 15 minutes or 5 minutes. This shorter duration computational time step may allow water-surface elevations to equilibrate, reducing the duration over which a head difference between lobes is maintained. This relatively shorter computational time step may reduce peak flow rates between lobes.*

- Response 32.
  - Although the cubic feet per second rates may be high when looked at instantaneously, the effect on simulated stages when integrated to daily average remains reasonable. This conclusion is supported by the fact that the lake stages in the low lobe do not show excessive fluctuations when the high lobe reaches the modeled invert.

▪ *Comment 33. Sarker and others (2023) did not publish a table of contents, list of figures, list of tables, or list of acronyms and abbreviations. SJRWMD may wish to revise the report to publish a table of contents, list of figures, list of tables and list of acronyms and abbreviations, to aid document readers.*

- Response 33.
  - A table of contents etc. was added. Acronyms and abbreviations are defined at first use.

- *Comment 34. Sarker and others (2023) referenced both Lake Prevatt and Prevatt Lake. Resource documents also refer to both Lake Prevatt and Prevatt Lake. SJRWMD may wish to ensure that the water body under consideration is consistently referenced by one name throughout all publications, for consistency and to avoid any potential confusion. SJRWMD may wish to acknowledge that the water body is referred to in resource documents as both Lake Prevatt and Prevatt Lake, but that SJRWMD adopts a chosen name, for consistency and to avoid confusion.*
  - Response 34.
    - The report has been updated to use Lake Prevatt throughout the report.
- *Comment 35. Sarker and others (2023) used the line of organic correlation method to determine correlations between proximate and distal groundwater wells. Sarker and others (2023) invoke the acronym LOC without defining the acronym. SJRWMD may wish to ensure that all acronyms are properly defined, and to publish a list of acronyms and abbreviations in the frontmatter.*
  - Response 35.
    - Our approach is to defined acronyms and abbreviations at first use. LOC is now properly defined.
- *Comment 36. Sarker and others (2023) typeset figure 16 caption and figure 16 on different pages. SJRWMD may wish to typeset the caption and figure on the same page.*
  - Response 36.
    - The report has been updated to typeset the caption and figure on the same page
- *Comment 37. Sarker and others (2023) referenced "pressure head in the UFA." Head in Darcy's Law includes both pressure and elevation. SJRWMD may wish to reference head in the UFA, in place of pressure head in the UFA.*
  - Response 37.
    - The report has been updated to reference head in place of pressure head in the UFA.
- *Comment 38. Sarker and others (2023, table 4) tabulated a range of calibrated lower zone nominal soil moisture storages for uplands, a range of calibrated indices to infiltration capacity for uplands, a range of calibrated upper zone nominal soil moisture storages for uplands, a range of calibrated lower zone evapotranspiration, and a range of calibrated leakance. SJRWMD may wish to map these heterogenous parameters over the domain. If ranges are cited because SJRWMD use a different value in the north lobe sub-watershed and the south lobe sub-watershed, SJRWMD may wish to refine table 4 to list a single, separate value for each lobe. If parameter ranges are limits of calibration, SJRWMD may wish to identify these as limits of calibration, and publish the final, single, calibrated parameter value.*
  - Response 38.
    - Except for leakance, these are watershed parameters that vary by land cover. All of these watershed parameters are the same for

both subwatersheds, except for DEEPFR. The report was updated to clarify this. Visualizing the parameter distribution would simply mirror the subwatershed map for DEEPFR and the land use map for the others, so separate parameter maps would provide no additional insight.

- *Comment 39. Sarker and others (2023, table 4) stated the "model tended to overestimate the dry periods". What parameter did the model overestimate? If the model overestimated water-surface elevation, SJRWMD may wish to explicitly state that water-surface elevation was overestimated. If some other parameter was overestimated, SJRWMD may choose to specify this parameter.*
  - Response 39.
    - The discussion in the report has been expanded to discuss where the model tends to underestimate or overestimate stages, and to point out the possible role of rainfall data, which is always a possibility when patterns of over- and under-estimation are inconsistent in this way.
    - Such tendencies cannot necessarily be attributed to a particular parameter such as the ones in Table 4.
- *Comment 40. Sarker and others (2023) captioned figure 18 and figure 20 as observed and simulated daily stage-duration curves. Do figure 18 or figure 20 show the duration over which a water-surface elevation is realized, in some unit of time, such as hours or days? SJRWMD may wish to re-consider whether figure 18 and figure 20 are stage-duration curves, or whether figure 18 and figure 20 are exceedance probability curves. If SJRWMD wish to plot duration, SJRWMD may wish to plot the horizontal axis in some unit of time, such as days or hours.*
  - Response 40.
    - In our experience, the modeling literature uses the terms "duration curve" and "exceedance probability curve" interchangeably. The term "duration curve" does not imply a specific length of time. Nevertheless, the text was altered to use the latter terminology as suggested.
- *Comment 41. Sarker and others (2023) used the phrase "across the board." This phrase is not a technical phrase. SJRWMD may wish to replace this phrase with a more technical phrase, such as "throughout the full range of plotted probabilities."*
  - Response 41.
    - The term was rephrased to "throughout the full …" as suggested, in the updated report on page 26.
- *Comment 42. Sarker and others (2023, page 20) characterized the model simulation of Lake Prevatt north lobe stage as adequate ("the model adequately simulated"). Given the importance of lake levels with relatively greater exceedance probabilities to developing a minimum lake level, SJRWMD may wish to revisit whether simulated water-surface elevations being uniformly less than measured water surface elevations in a validation simulation by as much as six inches over exceedance probabilities from about 90 percent to almost 99 percent is adequate (Sarker and*

*others, 2023, figure 22). SJRWMD may wish to consider the influence of storage in the upper watershed on lake levels with relatively greater exceedance probabilities (comment 5; **Figure 8**).*

- Response 42.
    - The model fits well during the calibration period, for which the watershed conditions represented in the model are most accurately reflected.
    - As this lake tends to fluctuate over a large range of stages, the range of errors at the low end mentioned may be reasonable.
    - Storage in the upper watershed would be expected to affect high stages, with little or no impact on the low stages mentioned here.

- *Comment 43. Sarker and others (2023) stated that "most of the targeted values were achieved" for the Lake Prevatt north lobe. Table 5 of Sarker and others (2023) of shows that six of six targeted values were achieved. SJRWMD may wish to re-consider this "most" characterization to quantitatively state "sis of six targeted values were achieved," or qualitatively state "all targeted values were achieved."*
    - Response 43.
        - The model report has been updated. See page 28.
- *Comment 44. Sarker and others (2023) stated that "many of the targeted values were achieved" for the Lake Prevatt south lobe. Table 6 of Sarker and others (2023) shows that two of six targeted values were achieved. SJRWMD may wish to re-consider this "many" characterization to quantitatively state "two of six targeted values were achieved," or qualitatively state "a few targeted values were achieved."*
    - Response 44.
        - The model report has been updated. See page 28.
- *Comment 45. In tables 5 and 6, Sarker and others (2023) typeset percent of observations bracketed within one foot as a whole number percentage, such as 65.30 percent, while other fit statistics are typeset with fractional representations of whole, such as 0.65. SJRWMD may wish to use a consistent expression of fraction of the whole.*
    - Response 45.
        - The values for the two statistics called "Percent…" are actually percentages, e.g in Table 5, the Percent Bias for the calibration is 0.02%. To clarify, all values and targets in these rows are marked explicitly with a "%" sign.
- *Comment 46. Sarker and others (2023) stated that the following factors contribute to uncertainty in a simulation of water-surface elevation in Lake Prevatt from 1953 to 2020: "estimated extensions of the groundwater boundary and South Lobe observed stages, the switch from NEXRAD rainfall used in calibration to a point station some distance from the watershed, and changing conditions on the watershed itself, such as land cover changes due to development." Sarker and others (2023) do not specify whether water-surface elevation measurements used for calibration and validation are also re-used for goodness-of-fit tests of this long-term simulation from 1953 to 2020. SJRWMD may wish to acknowledge the percentage of*

measurements used to judge goodness-of-fit of the long-term simulation were also used for calibration and validation. Sarker and others (2023) subsequently stated that the "fact that the metrics are still acceptable is evidence that the model is sufficient for predicting long-term behavior of the system outside of the calibration and validation periods." Sarker and others' (2023) assertion of sufficiency may not be firmly established, particularly given the apparent uniform weighting of measurements (comment 26), exclusion of areas that periodically drain to Lake Prevatt (comment 11 and 12), and exclusion of storage in the upper watershed (comment 10). Consequently, long-term simulation results may not be reasonable. SJRWMD may wish to establish sufficiency more firmly.

- Response 46.
  - The long-term model is not intended to be, nor presented as, a secondary validation period, so there was no reason to restrict the reuse of data in the same way that calibration data is not used for validation.
  - The long-term model run is used as a baseline for scenarios, not as an attempt to represent historic watershed conditions that differ from the current conditions and therefore goodness of fit statistics are not applicable. To avoid confusion on this point, the goodness of fit statistics table has been removed.

▪ Comment 47. HSPF is an appropriate model, to simulate water-surface elevations in Lake Prevatt, over decades. HSPF is an appropriate model to inform and support minimum lake level determination, for State of Florida states in Water Resource Implementation Rule 62.40.473.

- Response 47.
  - We agree with this comment.

▪ *Comment 48. Sarker and others' (2023) use of HSPF to simulate water-surface elevation in Lake Prevatt may not be appropriate, defensible, or valid, to inform and support minimum lake level determination, for State of Florida states in Water Resource Implementation Rule 62.40.473, due to several comments detailed in the present memorandum. Revision to address the following comments may substantially change simulated Lake Prevatt water-surface elevation and the relationship between lake stage and exceedance probability: comment 10 related to storage in the upper watershed, comment 11 related to watershed delineation, comment 12 related to Lake McCoy and Lake Coroni, and comment 26 related to calibration weights.*

- Response 48.
  - We examined and provided responses to the comments (10, 11, 12, 26) of concern. We believe that these responses support the defensibility and validity of the model for its intended purpose.

▪ *Comment 49. A simulation is an abstract representation of a more complex system. Simulations typically require assumptions that result in tractable solutions, but introduce abstractions. To simulate Lake Prevatt water-surface elevations, Sarker and others (2023) made several assumptions. For example, Sarker and others (2023)* *assumed leakance is constant over the duration of the simulation. Sarker and others (2023) did not systematically identify or justify assumptions. Because assumptions are not systematically identified and justified, reviewers of this simulation and the supporting document are challenged to methodically consider each assumption. SJRWMD may wish to revise the document that describes the simulation to systematically identify each assumption, and to explicitly justify each assumption.*

- Response 49.
  - The assumptions used in the model development are described through the report as they arise, rather than gathered into a single list. This is standard practice for our MFL modeling reports.

- *Comment 50. SJRWMD may wish to bookmark major headings in a portable document format version of the report that describes the simulation, to aid readers of the report.*
  - Response 50.
    - Upon finalization of the report, a pdf version of it will be provided.
- *Comment 51. SJRWMD determined an MFL for Lake Prevatt in 1998 (SJRWMD, 2023a). SJRWMD may wish to revise the report that describes the present simulation to further detain the Lake Prevatt MFL, describe the method used to quantify the minimum lake level, and compare the simulation described in Sarker and others (2023), if appropriate, to analyses to support the 1998 MFL.*
  - Response 51.
    - MFL model reports are intended to describe the current state of the system and the model representing it. A comparison to previous MFL models, which often use older methods to represent the past system, would be of little value in understanding the current analysis.
    - The methodology used to evaluate the minimum lake levels, based on this model and other factors, will be described in a separate report for the MFL itself, not in this model report.

- **Water Balance**
  - *Comment: In the 2006-to-2020 simulation, 76 percent of inflow to Lake Prevatt is runoff and 24 percent is rainfall (**Figure 18**). Total inflow to Lake Prevatt is the sum of runoff and rainfall. In the simulation, groundwater outflow from Lake Prevatt is equivalent to 69 percent of total inflow to Lake Prevatt. Rainfall on the surface of Lake Prevatt is about the same as evaporation from the surface of Lake Prevatt. Surface-water outflow from Lake Prevatt to Carpenter Branch in Wekiva Springs State Park is about 4 percent of total inflow to Lake Prevatt. In the 2006-to-2020 simulation, runoff from the simulated Lake Prevatt watershed to Lake Prevatt is equivalent to about 20 percent of rain on the simulated watershed (**Figure 19**). In the simulation, evapotranspiration from the simulated Lake Prevatt watershed is equivalent to 74 percent of rain on the watershed. In the simulation, infiltration from the simulated Lake Prevatt watershed to the Florida aquifer system is equivalent to 6 percent of rain on the simulated watershed.*
  - *Runoff and infiltration volumes are reasonable.*

- Response:
    - We agree with this comment.

References

Jobes, T., 2022. HSPF Common Logic for the St. Johns River Water Management District.