FINAL PEER REVIEW

REEVALUATION OF MINIMUM FLOWS FOR THE HOMOSASSA RIVER SYSTEM

AGREEMENT NUMBER: 19C00000003

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET
BROOKSVILLE, FLORIDA 34604

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EXECUTIVE SUMMARY OF PEER REVIEW

The Southwest Florida Water Management District (SWFWMD) contracted with an independent panel of experts to provide a technical peer review of the proposed Reevaluation of the Minimum Flows and Levels (MFL) for the Homosassa River/Homosassa Spring Group System. The Homosassa River system is located in Citrus County, on Florida's Springs Coast. The system consists of several named rivers and creeks and a spring group consisting of 24 named springs and other minor spring vents. The Homosassa River flows approximately 8 miles to its mouth near Shell Island in the Homosassa Bay region of the Gulf of Mexico. The system is tidally influenced throughout most of its extent.

As part of the reevaluation, a significant number of new studies and data collection were initiated. The new work included installation of seven continuous monitoring stations that collected water levels, velocities (for discharge calculation), salinity and temperature from around 2000 to the present; new measurements of biological resources, including submerged aquatic vegetation (SAV), benthic macroinvertebrates, and emergent and shoreline vegetation; a new hydrodynamic model using SWFWMD's Laterally Averaged Model for Estuaries (LAMFE) code; and a study of the relationships between flow and water quality. The most critical component of the MFL analyses was the new hydrodynamic model since it was utilized for the determination of the changes in snook thermal habitat that defined the MFL allowable reduction.

Another key component was the use of the Northern District Flow Model, Version 5.0 (NDM5), to provide an estimate of anthropogenic impacts of groundwater withdrawals on flows to the Homosassa River/Homosassa Spring Group. The model determined that withdrawals at 2015 levels result in a 1.9 percent reduction in flow, whereas withdrawals at 2035 levels (with planned conservation and reuse projects) result in a 2.6 percent reduction.

As stated previously, the proposed MFL for the Homosassa River/Homosassa Spring Group is based on a 15 percent change in thermal habitat for snook using the LAMFE model. The resultant allowable reduction in flow was defined at 5 percent. Other metrics directly assessed using the LAMFE model included salinity habitat (volume, bottom area, and shoreline length) and thermal manatee habitat. Additionally, a new analysis that evaluated

changes in water quality associated with flow reduction was provided. The flow reduction defined for the MFL was determined to be protective of these other components.

The peer review for this MFL was conducted in two phases. The first phase was an initial peer review that culminated in recommendations for changes to the report documentation and analyses and provided initial conclusions on the technical defensibility of the MFL. The initial conclusions and recommendations were included within a report entitled “Initial Peer Review – Re-evaluation of Minimum Flows for the Homosassa River System”. Following submittal of the Initial Peer Review Report, District staff made changes to the MFL report and one of the appendices along with providing additional technical documents in response to the recommendations. The following summarizes the final determination made by the Peer Review Panel based on documents provided.

Overall, the Peer Review Panel supports the conclusions presented within the MFL report and the use of the thermal habitat for snook as the primary metric. A key component of the MFL analyses, the hydrodynamic model, was generally found to be sufficiently developed and calibrated for use in evaluating the changes in the temperature and salinity as a function of submarine groundwater discharge (SGD).

The Initial Peer Review Report identified key comments/recommendations to improve the MFL report, supporting documentation, and associated analyses. The Initial Peer Review document provided detailed comments and recommendations, including grammatical edits. Key recommendations from the Initial Peer Review are summarized as follows.

- The panel identified that SWFWMD should address (outside of this Peer Review) the appropriateness of the blanket use of the 15 percent harm threshold. Concerns were raised that it has been a while since this criterion was proposed, that it is being potentially exported to resources not applicable to the original determinations, and more recent work has not been undertaken to validate the use of this metric. The panel determined that at this time, it is the most appropriate criterion to use.
- The documentation of the final time series of SGD should be improved within the report, including the distribution of the flows and how they were calculated and used.
- While the hydrodynamic model was deemed sufficient for use in determining the changes in salinity and temperature habitat as of function of SGD, there were some

issues identified within the review that should be resolved before final submission of the MFL report and supporting documentation. Some specific issues include: more documentation of testing of the LAMFE model code, discussion of why results under the MFL reevaluation differ significantly from the previous MFL evaluations for salinity habitat, better documentation of some of the model inputs, evaluation of the sensitivity of the boundary to changes in salinity under flow reduction, and some additional calibration metrics.

- How the changes in water quality are assessed should be altered, with specific reference to how the water quality criteria were utilized.

Based on the District responses to comments, additional technical documentation, and the updated documents, no unresolved recommendations remain. One of the recommendations that was completed by the District was a sensitivity analysis on the salinity levels in the SGDs. The recommendation was made based on concerns by the Panel that future withdrawals may increase the salinity levels in the SGDs. Based on analyses performed by the District, they determined that salinity levels in SGDs would not increase. Alternate analyses by a member of the Panel, identified that there is a potential for salinity to increase. The sensitivity analysis demonstrated that the change in low salinity habitat is highly sensitive to the SGD salinity levels. Therefore, if salinities in the SGD do increase under future withdrawals, it would alter the final salinity habitat change results. This has the potential to alter the driving metric for the MFL, i.e. salinity habitat change may drive the MFL rather than snook thermal habitat. This is an important area of uncertainty in the present MFL analyses and future work should focus on providing more data to make a final determination on the potential for salinity increases in the SGDs.

A component of the Peer Review Panel scope of work was to provide an assessment of the MFL report and supporting documentation against specific listed criteria. These are outlined in Section 3 of the report. The findings of the Peer Review Panel are that there are no fatal flaws within the MFL report and supporting documentation relative to the specified criteria based on the presently available data.

1.0 INTRODUCTION

1.1 BACKGROUND AND SYSTEM DESCRIPTION

The Southwest Florida Water Management District (SWFWMD) contracted with an independent panel of experts to provide a technical peer review of the proposed Reevaluation of Minimum Flows for the Homosassa River System. The Peer Review Panel includes:

- Dr. Steven Peene (panel chair)
- Dann Yobbi, P.G.
- Dr. Adam Munson

The Homosassa River system is located in Citrus County on Florida's Springs Coast. The system consists of several named rivers and creeks, surface drainage basins, a spring group consisting of 24 named springs and other minor spring vents, and an associated springshed. The Homosassa River and its springshed is one of five first-magnitude springs systems that define the Springs Coast region. For the purposes of this report, these components will be referred to as the Homosassa River/Homosassa Spring Group.

The Homosassa River flows approximately 8 miles to its mouth near Shell Island in the Homosassa Bay region of the Gulf of Mexico. The primary tributaries flowing to the Homosassa River main stem include Halls River, Otter Creek, Price Creek, Salt River, Battle Creek, Petty Creek, and Mason Creek. Figure 1-1, taken from the minimum flows and level (MFL) report (SWFWMD, 2018), shows the layout of the Homosassa River/Homosassa Spring Group, including the main stem of the river (with river miles shown), the various tributaries, and various named springs. Based upon historical studies, SWFWMD has identified that the spring vents provide the majority of the freshwater entering the system.

The discharge from the spring vents derives from groundwater within the system's springshed. The Homosassa River/Homosassa Spring Group springshed spans approximately 270 square miles, with the bulk of the springshed within southern Citrus County, and a portion within northern Hernando County (Figure 1-2).

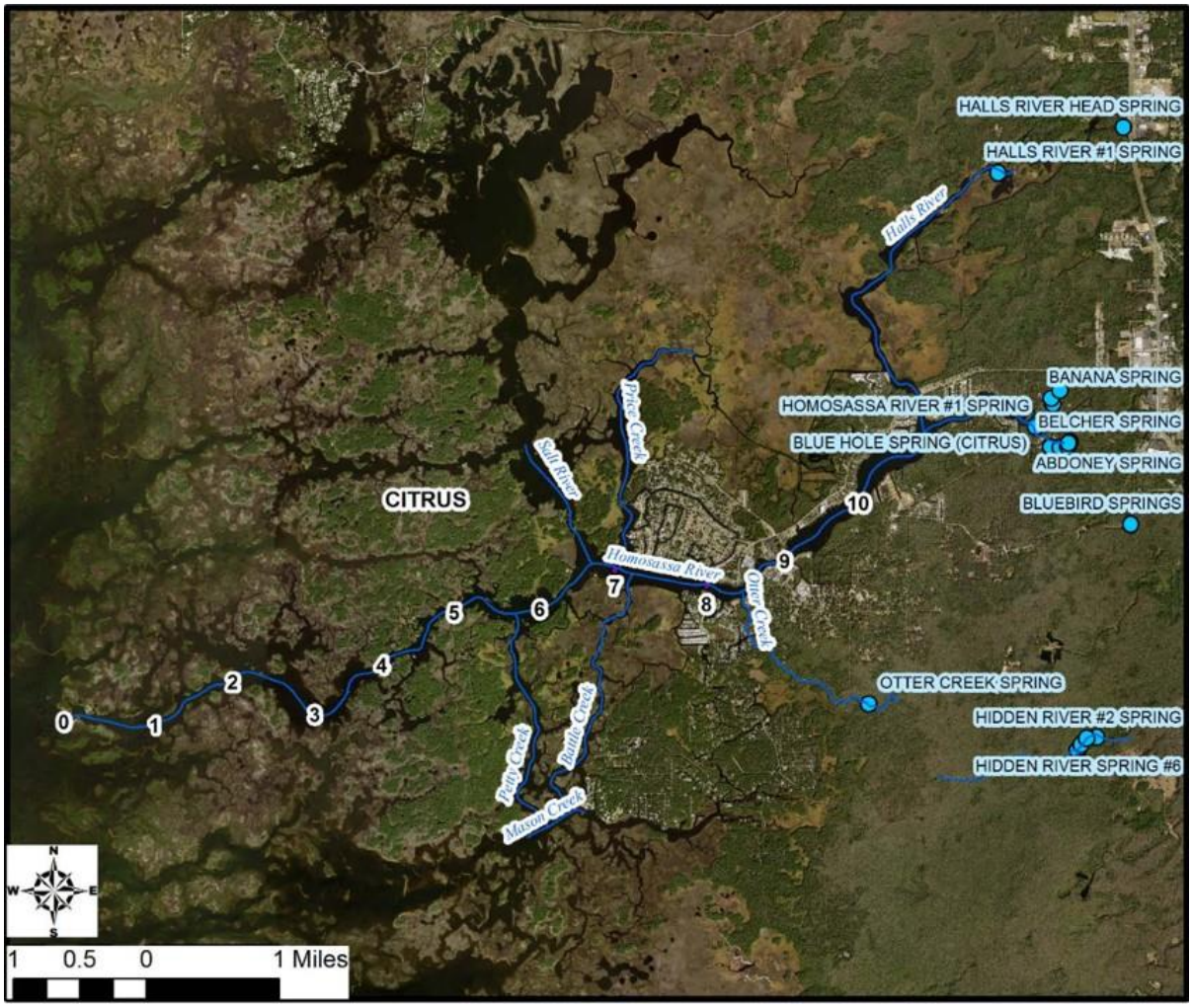

Figure 1-1. Homosassa River System River Segments and Springs (SWFWMD, 2018)

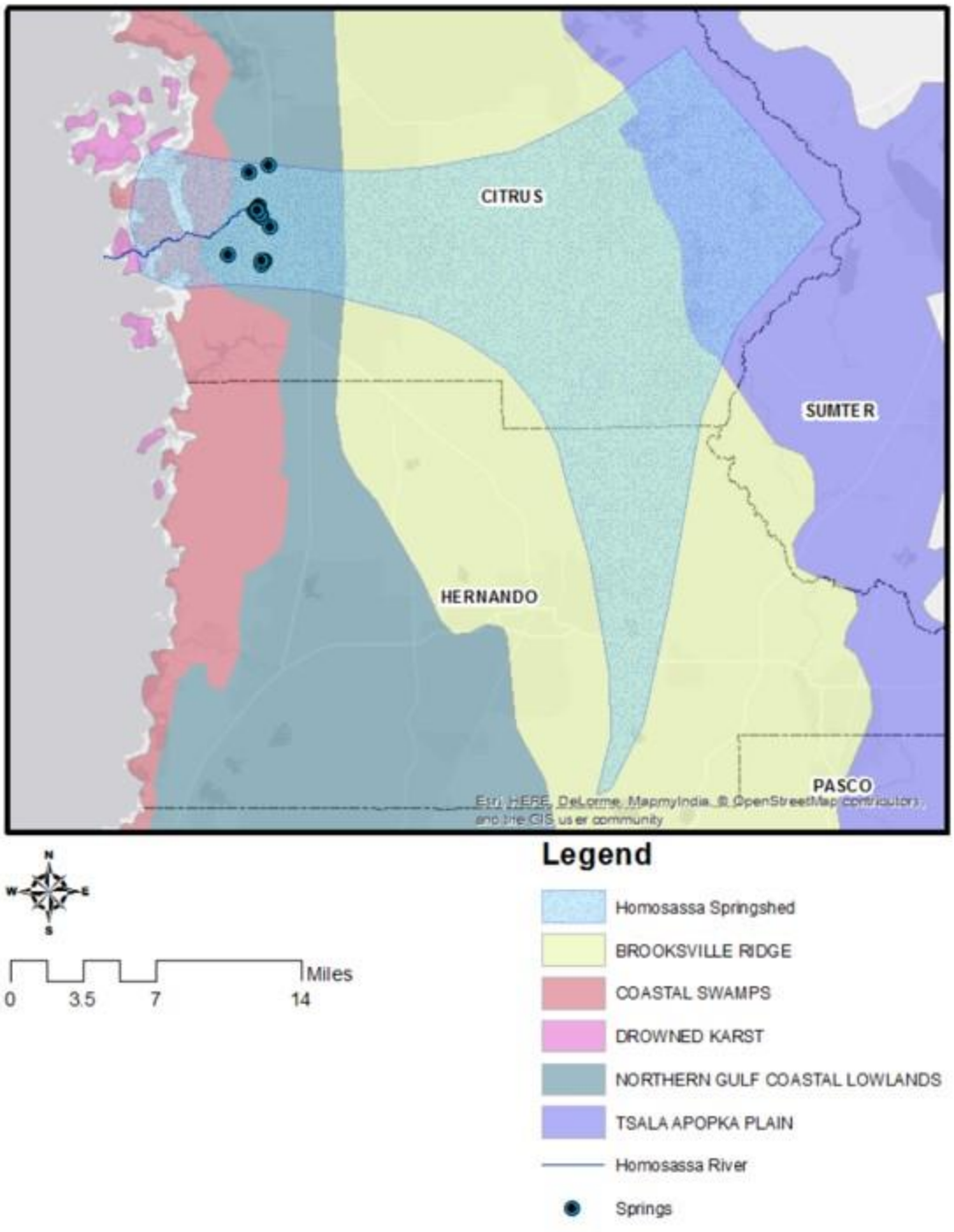

Figure 1-2. Extent of the Homosassa River/Homosassa Spring Group Springshed (SWFWMD, 2018)

A total of seven gage stations collected continuous data of stage, velocity (discharge), specific conductance (salinity), and temperature. Figure 1-3 shows the locations of the stations throughout the system. The periods of record for the seven gages vary but span from as early as 1970 to the present. The bulk of the data span from the early 2000s to the

present. All the stations other than U.S. Geologic Survey (USGS) Hidden River near Homosassa, FL (02310675) collected stage or gage height data, along with specific conductance and temperature. All the stations other than USGS Halls River near Homosassa, FL (02310690) and USGS Homosassa River at Shell Island near Homosassa, FL (02310712) collected data for the calculation of flows. Some stations collected both bottom and surface specific conductance and temperature, while others simply collected bottom measurements. The continuous data were utilized for multiple purposes, but the primary use was for development and calibration of a hydrodynamic model (discussed further below).

The accurate determination of the long-term total flow record [or submarine groundwater discharge (SGD), as described in the report] is a critical component of the MFL development. The calculated flows are discussed in detail in the MFL report and supporting documentation. Discussions center on the use of the data from the primary station that measured the collective flow in the system (USGS Homosassa River at Homosassa – 02310700) and calculation of flows through relationships based on water levels measured in nearby monitoring wells, and extrapolation of the measured flow at the USGS gage to determine total SGD.

A key component of the MFL redevelopment was the development, calibration, and verification of a new hydrodynamic model of the system that replaced a previously developed Environmental Fluid Dynamics Code (EFDC) model used in the initial MFL. The hydrodynamic model was utilized to assess the impacts of flow reductions from the spring vents on salinity and thermal habitat. SWFWMD utilized its internally developed Laterally Averaged Model for Estuaries (LAMFE) model. Development, calibration, and application of the hydrodynamic model is discussed in detail in the MFL report and supporting documentation. The assessment of the development, calibration, and application of the hydrodynamic model is a primary focus of the peer review.

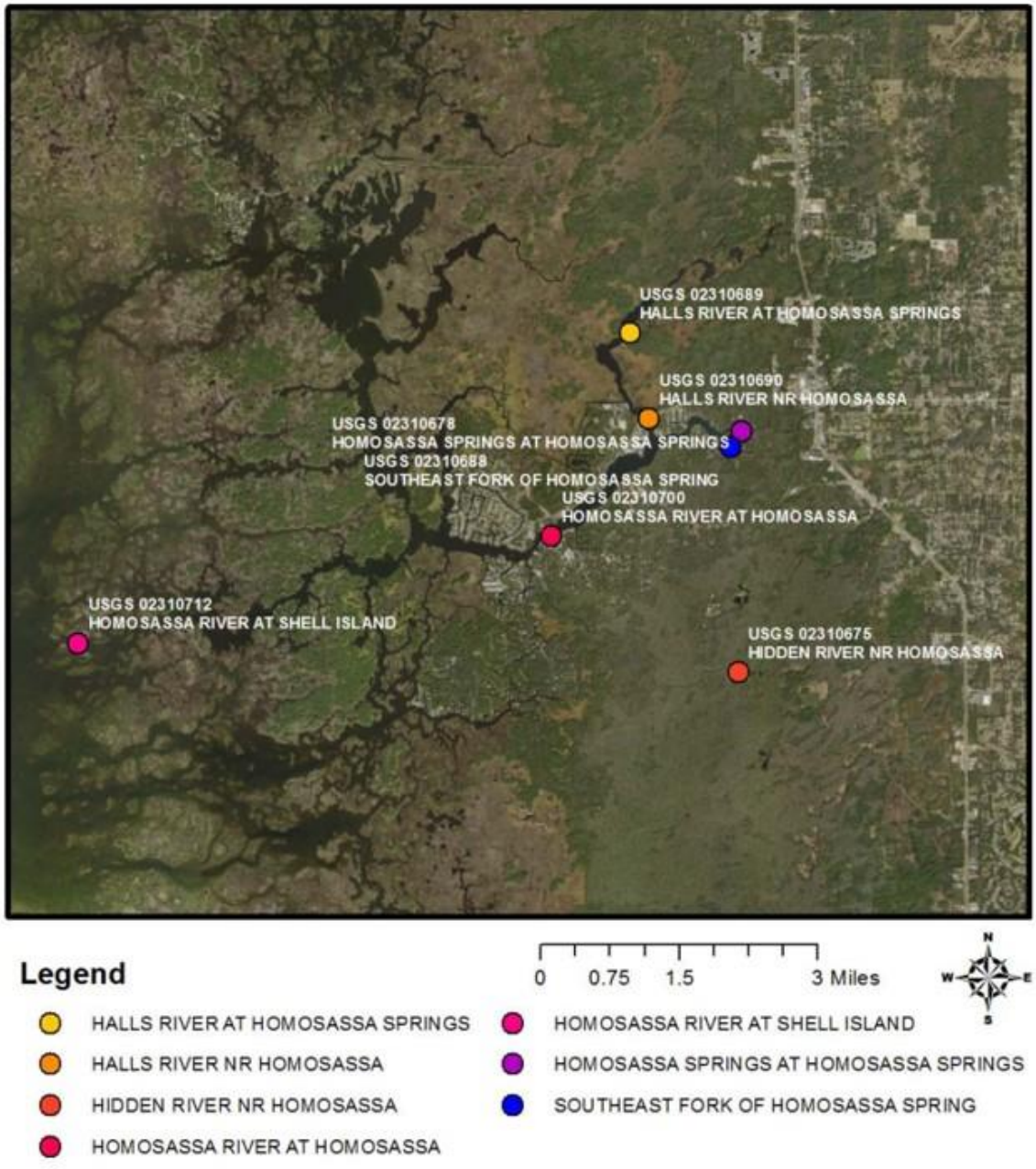

Figure 1-3. Current U.S. Geological Survey Surface-Water Gages in the Homosassa River/Homosassa Spring Group (SWFWMD, 2018)

A second key component was the use of the Northern District Flow Model, Version 5.0 (NDM5) to provide an estimate of anthropogenic impacts of groundwater withdrawals on flows to the Homosassa River/Homosassa Spring Group. The model determined that withdrawals at 2015 levels result in a 1.9 percent reduction in flow, whereas withdrawals at 2035 levels (with planned conservation and reuse projects) result in a 2.6 percent reduction.

In addition to the development of the new hydrodynamic model, a number of studies and data collection efforts were initiated to support the MFL reevaluation, including the following:

- A study to characterize the spatial variability of the benthic macroinvertebrate community abundance and distribution
- A study to collect submerged aquatic vegetation (SAV) data to provide for comparisons with historical surveys
- A sediment assessment study
- A detailed study of the relationships between flows and water quality in the system and the potential impacts to water quality
- A fish community assessment
- A study to map shoreline and emergent vegetation and compare the collected data with historical data to identify changes

The Florida Department of Environmental Protection (FDEP) has designated the Homosassa River/Homosassa Spring Group system as Class II (Shellfish Propagation or Harvesting) for the estuarine areas, and Class III (Fish Consumption, Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife) for the freshwater portions. The system is also designated an Outstanding Florida Water (OFW) and a SWFWMD Surface Water Improvement and Management (SWIM) Priority Waterbody. Key environmental resources in the area that were specifically targeted for protection in this MFL include SAV, water quality, manatee thermal habitat, and snook thermal habitat.

The final MFL presented within the report was based on allowance of a 15 percent reduction in snook thermal habitat using the hydrodynamic model. Based on the 15 percent habitat reduction, an allowable flow reduction of 5 percent was identified. Current water withdrawals are at or less than 2 percent of the baseline flow condition. Based on the comparison of the current withdrawals with the allowable, the MFL document concluded that no recovery strategy was needed.

1.2 REGULATORY BASIS FOR MFL AND PEER REVIEW

Florida Statutes (F.S.) mandate that SWFWMD must establish MFLs for state surface waters and aquifers within its boundaries for the purpose of protecting the water resources

and the ecology of the area from “significant harm.” Section 373.042, F.S., provides that the minimum flow for a given watercourse is the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area, and the minimum water level is the level of groundwater in an aquifer and the level of surface water at which further withdrawals would be significantly harmful to the water resources or ecology of the area.

Section 373.042, F.S., also provides that MFLs shall be calculated using the best information available, that the Governing Board shall consider and may provide for non-consumptive uses in the establishment of MFLs and, when appropriate, MFLs may be calculated to reflect seasonal variation. The law also requires that when establishing MFLs, changes and structural alterations to watersheds, surface waters, and aquifers shall also be considered (Section 373.0421, F.S.). The State Water Resource Implementation Rules (Chapter 62-40, Florida Administrative Code) includes additional guidance for establishing MFLs, providing that “…consideration shall be given to the protection of water resources, natural seasonal fluctuations in water flows or levels, and environmental values associated with coastal, estuarine, aquatic, and wetlands ecology, including:

a) Recreation, in and on the water;
b) Fish and wildlife habitats and the passage of fish;
c) Estuarine resources;
d) Transfer of detrital material;
e) Maintenance of freshwater storage and supply;
f) Aesthetic and scenic attributes;
g) Filtration and absorption of nutrients and other pollutants;
h) Sediment loads;
i) Water quality; and
j) Navigation.”

Section 373.042, F.S., also addresses independent scientific peer review of MFLs, specifying the review of all scientific or technical data, methodologies, and models, including all scientific and technical assumptions employed in each model, used to establish a minimum flow or minimum water level. In addition, the law requires that FDEP or the District Governing Board shall give significant weight to the final peer review panel report when establishing MFLs.

1.3 DOCUMENTS AND DATA UTILIZED IN THE PEER REVIEW

As discussed earlier, the peer review was conducted in two phases. In the first phase the Peer Review Panel provided initial comments and recommendations on the MFL and other supporting documentation. Following submittal of the initial peer review, the District made modifications to some of the MFL documents and provided additional technical documents to support their responses. The following documents and data were provided to the panel members to be utilized in the initial peer review.

- Reevaluation of Minimum Flows for the Homosassa River System – Peer Review Draft (SWFWMD, 2018)
- Coastal Rivers Invertebrate Analysis Final Report (AMEC Foster Wheeler, 2016)
- Coastal Rivers Aquatic Vegetation Analysis, for Weeki Wachee, Chassahowitzka, and Homosassa Rivers (ATM, 2016)
- Sediment Assessment Report, Coastal Rivers: Homosassa, Chassahowitzka, and Weeki Wachee (Arcadis, 2016)
- Radar-Estimated Rainfall in the Chassahowitzka Springshed from 1995-2017 (SWFWMD, 2019a)
- Estimated and Metered Groundwater Use in the Homosassa Springshed from 1992-2016 (includes Domestic self-supply) (SWFWMD, 2019b)
- Hydrodynamic Modeling of Effects of Flow Reduction on Salinity and Thermal Habitats in the Homosassa River (SWFWMD, 2019c)
- Exploratory Evaluation of Water Quality and Flow Relationships for the Homosassa River in Support of Minimum Flows Reevaluation (Janicki Environmental, 2018)
- Springs Coast Fish Community Assessment (E.R. Johnson, et al., 2017)
- Final Report for Shoreline Vegetation Assessment of the Chassahowitzka and Homosassa River Systems (Water and Air, 2018)
- Review of Minimum Flows and Levels for the Lower Alafia River, FL (SWFWMD, 2008)
- Relationships of Nitrate to Flow in Springs of the Suwannee River Water Management District, FL (Upchurch et al., 2008)
- A sensitivity analysis of low salinity habitats simulated by a hydrodynamic model in the Manatee River estuary in Florida, USA (Chen, 2012)
- LAMFE Hydrodynamic Model Files

The District then provided the following updated documents and new supporting documents to the peer review panel;

- Response to Initial Peer Review Reevaluation of Minimum Flows for the Homosassa River System (SWFWMD, 2019d)
- Reevaluation of Minimum Flows for the Homosassa River System – Working Draft (SWFWMD, 2019e)
- A Modeling Study of Effects of Flow Reduction on Salinity and Thermal Habitats in the Homosassa River (SWFWMD, 2019c)
- Will A Reduction of Submarine Groundwater Discharge Cause Salinity in SGD to Increase in the Chassahowitzka and Homosassa Rivers? (Chen, 2019)
- Slides of the Coastal Chlorides History (SWFWMD, 2019f)
- Sensitivity Analyses of Salinity Habitats to SGD and SGD Salinity in Chassahowitzka and Homosassa Rivers (SWFWMD, 2019g)

1.4 PEER REVIEW PANEL SCOPE AND APPROACH

The Peer Review Panel was scoped to complete the following tasks as part of the MFL peer review.

- Provide an Initial Peer Review report of the Reevaluation of Minimum Flows for the Homosassa River System, Peer Review Draft and supporting documentation
- Participate in initial review Public Meetings including:
    - Kickoff Meeting and Site Visit (February 8, 2019)
    - Web-Meetings (February 18, 25 and March 4, 11 2019)
- Review District responses to Initial Peer Review report
- Participate in final peer review Public Meetings including;
    - Web-Meetings (May 13, 22, and 29, 2019)
- Provide a Final Peer Review report of the Reevaluation of Minimum Flows for the Homosassa River System, Working Draft
- Post written review comments and collaborate with other panelists to develop a single peer review panel report
- Review and provide support in development of meeting agendas and meeting summaries

Following the process outlined in this scope, the subsequent sections present the results, comments, and recommendations of the Peer Review Panel.

Section 2 of this report provides both general and specific comments. Section 2.1 presents general comments on key components of the MFL identified by the Peer Review Panel. For this Final Peer Review report, following each key component is a summary of the panel's findings relative to the District's responses to recommendations made in the Initial Peer Review report. Section 2.2 utilizes a tabular template (completed by each of the three peer reviewers) to support SWFWMD's peer review requirements. The tabular comments are presented for each section of the MFL report, as well as key supporting documentation within the appendices. The tabularized comments include the specific comment, whether the comment has significant impact on the conclusions of the MFL, recommendations on how to address the comment, and the panel member's determination if the specific comment has been adequately addressed.

Section 3 presents tabularized results of the panel's comments concerning SWFWMD's peer review assessment criteria. These criteria were specific scoped sub-tasks outlined by SWFWMD for the panel members to address.

Section 4 presents referenced literature.

2.0 REVIEW OF MFL REPORT AND SUPPORTING DOCUMENTATION

The following sections provide general and specific comments on the MFL report and supporting documentation provided by SWFWMD for use by the Peer Review Panel. Section 2.1 presents general comments on the overall MFL as well as specific key components of the MFL identified by the panel. Following each of the general comments in Section 2.1, the panel's determination of whether or not the recommendation has been adequately addressed by the District is provided. Section 2.2 provides specific comments in tabular format. The tables provide the following:

- Panel member providing the comment
- Identification of what document and location within the document to which the comment pertains
- Identification if the comment directly and materially affects the conclusions of the report
- The specific comment
- The reviewers' recommended corrective action
- The reviewers' determination if the District has adequately addressed the specific comment

2.1 GENERAL COMMENTS

Overall, the panel members have concluded that the SWFWMD report and supporting documentation provided for the Homosassa River/Homosassa Spring Group MFL are of high quality, well written, and representative of an extensive work effort since the completion of the previous MFL. The panel members feel that SWFWMD has built upon and improved upon the previous analyses. Overall, the Peer Review Panel supports the conclusions presented within the MFL report and the use of the three critical habitats as the defining metrics. In the Initial Peer Review Report, the panel identified key comments/recommendations to improve the MFL report, supporting documentation, and associated analyses. These original comments/recommendations are maintained in the document. Following each section, a determination by the panel if the recommendation/comment was adequately addressed is provided.

Specific components of the MFL report and supporting documentation were identified by the Peer Review Panel as critical in the MFL development. The following components were identified for specific review and discussion:

- The significant harm threshold of 15 percent habitat change
- Determination of the SGD
- Groundwater modeling
- Saltwater in springs
- Hydrodynamic modeling
- Water quality analyses
- Biological communities

The following presents the reviewers' discussion of these items.

Significant Harm Threshold of 15 Percent Habitat Change

It has become standard practice for MFL proposals to set the SWFWMD threshold for "significant harm" to be defined as allowing no greater than a 15 percent decline in specified water resource values (WRVs). While this standard has been found to be reasonable in previous MFLs, it was first defined 17 years ago and was focused on specific habitat types and conditions. Since that time, the standard has been used on an increasingly diverse range of habitat measures, including ones defined by salinity, temperature, rooting zones, inundation, etc. Additionally, SWFWMD should recognize that the standards it first used are being exported to other Districts and likely cited by other regulators across the country. For the purposes of this MFL, the 15 percent was extended to include allowable excursions of water quality above a specified threshold.

Many of the prior peer reviews of various MFLs have encouraged further monitoring, testing, and analysis to support that the 15 percent threshold selected is protective of ecological habitats or water resources. To date, including this evaluation of the Homosassa River system, no further monitoring, testing, etc. has been reported. Noting the prior concerns by reviewers and that the threshold remains unverified by additional "tests," the question remains about how much the recommended MFL might have changed if a more stringent standard were adopted. SWFWMD must make a practical attempt, take visible steps, and

transparently report the uncertainty and subjectivity associated with the 15 percent threshold criterion for this MFL.

At present, the 15 percent criterion is the only defined approach, and it provides consistency with MFLs developed throughout the state. Based on this, the panel has determined that, at this time, there is not a better alternative approach or criterion, and the 15 percent criteria is superior to a presumptive limitation. Additionally, given the time constraints on the Peer Review Panel to focus on the specific technical aspects of the MFL, there is insufficient time to perform a detailed assessment of the history of work that defined the criterion and its applicability to resources in the Homosassa River/Homosassa Spring Group. That being said, a recommendation of the panel is that SWFWMD should commit to the assessment needed to determine whether this criterion is truly protective of individual resources within the Homosassa River/Homosassa Spring Group and other similar systems.

Panel Determination on Adequacy of District Response: The determination made by the panel is that at this time the 15% change criteria is the best available approach to the determination of the allowable MFLs for the Homosassa system. A recommendation is made for the District to perform a re-evaluation of the 15% criteria outside of any specific MFL peer review process. The District should take the lead to initiate research of identified scientific unknowns. The experimental studies should examine the effects on multiple species of interest response to a wide range of potential habitat loss size (expressed as percentages). This should be done by working with an expert panel specifically charged with performing a re-evaluation of the scientific validity of the 15% criteria and the range of ways it is presently being applied within MFLs at the SWFWMD and other Districts. This could be a joint effort between various Districts as at present many are utilizing the criteria for their MFL analyses.

Determination of Submarine Groundwater Discharge

The development of the SGD time series for the Homosassa River/Homosassa Spring Group is an important component of the development of the MFLs. These time series are a critical input condition for the LAMFE hydrodynamic model. They also provide the basis for other analyses, like the relationship between flow withdrawal and water quality. Throughout the reports, there are multiple presentations of the various methods for calculation of flows from various tributaries and along the main stem. What is missing is a specific section or

sub-section of the report that summarizes all the flow measurements/calculations and presents a definitive single time series of the total SGD that is utilized for all other analyses. This section would also explain the distribution of the final flow. These data exist because the hydrodynamic model utilizes them as boundary conditions for the simulation period. While these data may be presented in different parts of the report, it is not clearly summarized to provide a final SGD time series. A section could be added to the report within the Gage Data, Section 2.3. This would be Section 2.3.8 – Total Submarine Groundwater Discharge and Distribution. This write up could also be provided within Chapter 5.

Panel Determination on Adequacy of District Response: The updated MFL report has new write ups included in Chapters 2 and 7 that provide time series plots of the full flow record for the SGDs along with tables of statistical analyses and a CDF of the unimpacted flow, the impacted flows, and the minimum flow condition. Additionally, as part of previous updates to the Homosassa hydrodynamic model report, time series plots of the SGD flow, temperature and salinity boundary conditions used in the modeling were provided. Based on these updates to the reports, the issues identified relative to the SGD documentation have been addressed.

Ground Water Modeling

The NDM5 is a key tool in determination of the recommended MFL. An estimate of anthropogenic impacts of groundwater withdrawals on flows to the Homosassa River/Homosassa Spring Group was estimated by numerical simulation of the groundwater system using the NDM5. The model was calibrated to 1995 steady-state conditions and transient conditions from 1996-2006. The model also was verified for 2010 steady-state conditions. The NDM5 model was subject to a separate independent peer review by Drs. Anderson and Stewart in 2016. Based on this review of the supporting technical documents, including the Anderson and Stewart review, the groundwater flow model is conceptualized appropriately and meets accepted model calibration standards. The aquifer system is more complex (flow system is neither isotropic nor homogenous) than the model assumptions inherent using the selected MODFLOW packages utilized. However, the abundant occurrence of secondary porosity features does not invalidate usage of the equivalent porous medium model for simulating average annual regional groundwater flow over the model domain. The model as developed is a useful tool for SWFWMD to use in

evaluating regional changes in stress to the system for annual, monthly, or seasonal average conditions.

Panel Determination on Adequacy of District Response: This section did not require action by the District for response.

Saltwater in Springs

The MFL report and supporting documentation do not adequately address how salinity in the springs that discharge to the Homosassa River/Homosassa Spring Group will change in response to changes in groundwater pumping in the Northern District. Measured chloride concentrations in the springs vary by an order of magnitude, and specific conductance in spring waters has increased since the 1960s (Knochenmus and Yobbi, 2001), suggesting upward movement of the saltwater-freshwater interface. This is of concern because modest change in future pumping rates can potentially alter the amount and proportion of discharge from discrete vertically spaced vents of varying salinity discharged to spring groups. Temporal changes in quantity and quality of flow from individual vents must be better understood and warrant further consideration. Salinity changes in springs are important because the mineral content of springs with naturally higher salinity can have an influence on biological diversity within their waters and, therefore, is important to consider when evaluating their ecological health (FDEP, Springs Initiative Report). Additionally, the impact of higher salinities on water clarity must be assessed.

Increases in salinity within the various spring vents that discharge to the Homosassa River/Homosassa Spring Group directly impact the results from the LAMFE modeling (discussed below) as the vent discharges represent boundary conditions in the model. Presently, for the flow reduction scenarios, the assumption is that the vent salinities do not change, i.e., the same upstream salinity boundary conditions are used for the baseline condition and all flow reduction scenarios. If the boundaries increased, it may decrease the flow reduction that creates the 15 percent change in salinity habitat.

Panel Determination on Adequacy of District Response: The panel agrees with the District's conclusion that an analysis of region-wide changes in groundwater salinity in response to groundwater pumping is not possible at this time because the data are "not suitable for analysis". However, the panel does not fully agree with the conclusion that "there is no

evidence that a flow reduction will cause an increase of salinity" as reported by Chen (2019, Appendix 11). The panel feels that while the District has presented some information supporting the conclusion that flow reduction will not cause increases, panel members have evaluated the data and found that some evidence exists that levels could increase. At this time the panel feels that there remains uncertainty on this issue. In response to Panel recommendations a sensitivity analysis on the salinity levels in the SGDs was conducted. The sensitivity analysis demonstrated that the change in low salinity habitat is highly sensitive to the SGD salinity levels. Therefore, if salinities in the SGD do increase under future withdrawals, the allowable percent reductions under the salinity habitat assessments would be reduced. While presently salinity habitat change is not one of the drivers of the MFL, this is an important area of uncertainty in the present MFL analyses and future work should focus on providing more data to make a final determination on the potential for salinity increases in the SGDs.

Hydrodynamic Modeling

SWFWMD used the LAMFE model as the primary (essential) tool to quantify or determine the recommended MFLs. The LAMFE model is a laterally averaged two-dimensional hydrodynamic model that was developed by SWFWMD staff. This model is not utilized outside of SWFWMD and does not have the history and broad testing of some other hydrodynamic models currently utilized for this type of work. Based on this, it is important that the modeling report reference and provide discussion of available documentation for review of the model in past applications.

Review of the data set utilized for the development and calibration of the LAMFE model verified that it had sufficient temporal and spatial coverage and was a robust data set. Additional data analyses could be provided in the modeling report and summarized in the MFL report to provide the reader with a detailed understanding of key aspects of the system's hydrodynamic behavior that the model represents,. This helps to strengthen the confidence in the model simulations.

Key model inputs are the depths that are utilized in the model's geometric representation of the system. These data, along with the sources of the data, were not presented in the MFL report or modeling report.

The model discretization, resolution, and coverage are sufficient for the purposes of the hydrodynamic modeling. The model report has some aspects that are not well documented. Specifically, the upstream boundary conditions for flow, salinity and temperature for each of the inflow points in the hydrodynamic model are not provided as time series plots or as a map showing where the inflows come into the model. Additionally, the extrapolated boundary conditions for the two (unmeasured) open boundaries (Salt Creek and Mason Creek) should be sensitivity tested for their impact on the final conclusions since, at times, the extrapolations are not very good.

Review of the water level, salinity, and temperature calibrations (time series comparisons and statistics) indicates that the model is reasonably simulating the system hydrodynamics. One change to the report is that, where upstream USGS station data are utilized as boundary conditions for salinity and temperature, they should not be included as part of the model calibration. Also, root mean square (RMS) data should be provided as part of the calibration statistics.

With some of the boundary condition issues listed above and the upstream boundary issues relative to potential future salinity increases due to additional withdrawals, a section discussing the sensitivity of the model to various inputs is warranted.

In the previous MFL developed for the Homosassa River/Homosassa Springs Group, the MFL reductions were driven by changes in salinity habitats as simulated by the EFDC hydrodynamic model (SWFWMD, 2012). The allowable reduction was 3%. In the present analyses, the hydrodynamic modeling for the same habitat type (salinity) allowed for an 11% reduction. The difference between the previous and current salinity habitat assessments are significant. While differences in model results occur, the degree of difference is problematic indicating that one of the two models did not accurately simulate the salinity changes. During questioning on this aspect by the Peer Review Panel, District staff provided some potential reasons for these differences and Panel members noted that the explanations had merit. But given the difference in the analyses and their importance to the setting of the previous MFL, the District needs to provide a full technical evaluation of the differences and why the LAMFE model is more accurate.

Panel Determination on Adequacy of District Response: The Panel has determined that the District has adequately responded to nearly all of the recommendations/comments provided on this subject area. One area not addressed was a technical evaluation of the significant difference in the salinity habitat results between the previous EFDC model and the new model. While a comprehensive evaluation of the previous modeling was not conducted by the Panel, a cursory review of the EFDC model identified concerns with its grid construction.

Water Quality Analyses

For this MFL re-evaluation, a significant effort was undertaken to develop relationships between flows and water quality response in the system. This is a good step forward, given the water quality issues in the systems and comments made from the previous MFL.

For various total dissolved solids (TDS) components, significant negative relationships were found between flow and the various constituents, i.e., higher values at lower flows. This makes sense since these constituents come from exposure in the groundwater environment, so longer residence times underground would result in higher values.

For nutrients, some relationships (both positive and negative) were found for inorganic nitrogen, but no real relationships were found for the organic and total forms. The relationships were identified in the report as inconsistent for the inorganic forms. The report stated that the findings supported the work of Upchurch, who concluded that for the Suwannee, minimum flows could not be used to control nitrate concentrations. Unlike the TDS components, nitrogen components are not sourced through exposure during their groundwater residence time but, rather, they are sourced through infiltration from the surface. As such, one would not directly expect the type of relationship seen for TDS.

The analyses showed a significant relationship between flow and Chlorophyll *a* (Chl *a*). The relationships were negative, so that a reduced flow resulted in an increase in Chl *a*. This finding is most likely a function of reduced residence time associated with reduced flows. This is a typical response, i.e., increasing residence time, increased Chl *a*. The relationships were then used in a predictive model to assess what reductions in flow would result in a 15 percent increase in the number of exceedances of the numeric nutrient criteria (NNC) standard for Chl *a* over the full length of the system. While the technical analyses were strong (regressions and models), how the flow/Chl *a* model was utilized is problematic.

The analyses utilized the criterion outside of its temporal limitations (daily versus an annual geomean) and its spatial coverage [data from the upstream waterbody segment (WBID) were included where the criterion does not apply]. Additionally, the reports provided graphics where the annual geometric mean for the Chl *a* were calculated. These were presented against the numeric nutrient criteria (NNC). For this evaluation, while the temporal issues were addressed (annual geomeans), the spatial extent of the data that are compared against the NNC were outside of the appropriate spatial range.

The comparison of Chl *a* to the criteria has perhaps resulted in ignoring other characteristics of Chl that are important to the system. Discussion with stakeholders suggest that water clarity is a concern and is a component of one of the 10 environmental values (aesthetics and scenic value). Chl is related to clarity, and flow and residence time are components of Chl growth. This was a discussion during the Kings Bay Crystal River MFL. This report would benefit from further discussion of water clarity as it relates to Chl (including in the areas outside of where the Chl criteria apply) and any presumptions that were made based on the NNC. Further, if Chl is not the major constituent of reduced clarity, that would warrant discussion as well.

Panel Determination on Adequacy of District Response: The primary comments surrounding the water quality analyses related to how the NNC were discussed and characterized in the MFL report and the water quality report. The District provided changes in the language utilized in the MFL reports addressing the comment. The District identified that they would provide some introductory language for the water quality appendices outlining the issues and how the NNC should be evaluated (this language was provided). While this provides some clarification, future issues may arise where the approach and language in the water quality appendices do not match the updated approach and discussions in the MFL document.

Biological Communities Assessment

Relative to SAV, SWFWMD states that annual variability is expected in these coastal spring-fed systems. There is narrow agreement with this statement. Storm (scour and salinity) can alter compositions significantly, and higher salinities caused by low flow conditions can also cause alterations. Still, the changes from the early 2000s to 2010 and the observations from 2015 show considerable change. SWFWMD correctly points out that seasonal variability

exists, and that discontinuous sampling may miss important patterns in community composition, biomass, and area coverage. This raises the question of whether the data is of little use if not collected more continuously. It suggests that, for the purposes of reevaluation, a single study preformed just prior to reevaluation may be of limited value and SWFWMD should consider the value of more continuous monitoring along these coastal spring-fed rivers. It might especially consider this in similar rivers on the priority list for development or reevaluation. It is noted that SWFWMD has a contract for twice-a-year fish sampling with the Florida Fish and Wildlife Conservation Commission (FWC). Are the fish indicators more valuable or simply are they more obtainable at a reasonable cost?

The report states that "Biological components of the system, including fish communities, vegetation and oysters are stable." This was not the impression of vegetative communities gained from the report (Chapter 4.2.3). Specifically, SAV was not demonstrated to be stable but actually shown to be quite variable. Some vegetative communities are stable but stakeholders express considerable concern over SAV during the public kickoff meeting and there is at least some concern about SAV assemblages. This needs to be discussed in more detail.

A 15 percent reduction in thermal habitat was the metric utilized for snook and, ultimately, the metric that defined the MFL. For manatee, the same evaluation was performed, but the changes in thermal habitat were tempered, based upon the determination of excess capacity for manatee. The 2010 winter fish kill is evidence of the need for thermal refuge, and the panel supports the species-specific standards since there is extensive information available about the common game fish. However, the report contains no explanation about why the excess capacity evaluation was done for manatee but not for snook. The snook standard invites comparison to the manatee standard. The rational for the difference in application should be discussed.

Panel Determination on Adequacy of District Response: The Panel has determined that the District has adequately responded to the comments/recommendations made.

2.2 DETAILED COMMENTS

This section presents detailed comments in tabularized form for the MFL report and (where specific comments were provided) supporting documentation. The tables include the location in the report the comment refers to, the specific comment, whether the comment

materially impacts the conclusions of the MFL, proposed corrective actions, and a determination by the reviewer if the comment has been adequately addressed.

Table 2-1. Review of Table of Contents

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
1	DY	Page v	No	Add subsections 4.3.1.1, 4.3.1.2, and 4.3.1.3 to table of contents	Add to Table of Contents	Yes
2	DY	Page vi	No	Add list of acronyms and abbreviations.	Add to Table of Contents	Yes
3	DY	Page vii	No	List of Appendices -- suggest adding the peer report by Anderson and Stewart (2016) to appendices	Add to Appendices	Yes
4	AM	Overall Impression	No	The District's report is thorough and well organized. It represents their commitment to adaptive managements and shows evolution to the MFL process in as little as 6 years. The district continues its multiparameter approach selecting the most conservative reduction as the standard. In the case that that standard is buttressed by other similarly restrictive standards we gain confidence as to the appropriateness of the MFL. There are some concerns/questions that my first read has generated and we can use the coming weeks to alleviate or expand on those.	No action required	Yes

Table 2-2. Review of Executive Summary

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
5	DY	Page ix	No	Add the use of the updated Northern District groundwater flow model to the list of updates.	Add to text	Yes

Table 2-3. Review of Chapter 1 – Introduction

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
6	SP	Page 4, Paragraph 1, Sentence 2	No	Editorial: Incomplete sentence.	Revise sentence.	Yes
7	SP	Page 5, Paragraph 5, Sentence 1	No	While at this time, no better criteria are available, the District needs to (outside of any specific MFL review) do some updated evaluation of this criteria and its applicability to all resources being considered.	No specific corrective action relative to this MFL, but work should be done to better support future MFLs or re-evaluations.	Yes
8	SP	Page 6, Paragraph 1, Last sentence	No	This criterion is being applied to other habitats and water resource values outside of those analyzed under PHABSIM. This furthers the argument for the District to conduct an updated general review of the criteria for MFL development.	No specific corrective action relative to this MFL, but work should be done to better support future MFLs or re-evaluations.	Yes
9	SP	Page 6, Paragraph 3, Last sentence	No	This specific MFL does not really consider the unique characteristics of the Chassahowitzka System to determine how it may be expected to respond to flow reductions in that the 15% criterion is utilized as a blanket number.	Provide additional support for how the Chassahowitzka System specifically will respond to the 15% reduction.	Yes

Table 2-3. Review of Chapter 1 – Introduction

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
10	SP	Page 9, Item 1, Sentences 1 and 2	No	This may be a misleading statement since the LAMFE model cannot represent cross-sectional variations in velocity that may exist. This statement may be more appropriate if it relates directly to the two applications, rather than the models in general, which is how this comes across. There are tradeoffs between the two models, and how well EFDC could represent the system is a function of the grid resolution.	Revise the text to include a discussion of the advantages and disadvantages of how the two models interpret this system.	Yes

Table 2-3. Review of Chapter 1 – Introduction

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
11	DY	Page 5, Section 1.4	Maybe	The District used the percentage-of-flow approach for establishing minimum flows for Homosassa River System that set limits on groundwater pumpage as a proportion of river flow over its entire flow regime without causing significant harm. This approach for establishing MFLs assumes linearity in environmental responses which hardly is ever true for hydrologic systems or individual hydrologic variables. While the flow of Homosassa River does not exhibit strong seasonal patterns, the application of a linear percentage-of-flow determination merits further exploration of the effect of a smaller permissible flow reduction at lower flows when the springs are discharging less.	Provide further discussion explaining why using an average flow alone is sufficient to protect spring-fed rivers from significant harm. Other Water Management Districts use a series of flow statistics to determine minimum flows for spring-fed rivers	Yes

12	DY	Page 5, Section 1.4.1	Maybe	Even though many peer reviewers have accepted the use of a 15% threshold, many have indicated that this value is, in larger part, accepted de facto and its representation of the point at which significant harm actually occurs is presumptive. Additionally, many of the reviews go on to encourage further investigation of this threshold. I recognize the reasonableness of adopting a value such as 15%; however, the District must make a practical attempt, take visible steps, and transparently report the uncertainty and subjectivity associated with 15% threshold criterion. One size does not fit all. While some ecosystems may tolerate reductions greater than 15% others may tolerate considerably less, especially if already stressed by additional physical, chemical or biological factors. An argument for a more stringent standard for the Homosassa River System easily could be defended given the observed long-term increases in nitrate and chloride from the springs.	Provide further discussion explaining the subjectivity and uncertainty in this threshold criterion and steps the District plans to better quantify this standard for springs-fed rivers	Yes
13	DY	Page 6, Section 1.4.1	No	Clarify this statement "*although the majority of studies (86%-92%) recorded ecological changes in response to reduced flow, there is no universal responses that can be used to generalize across systems*". Seems to me that the District is generalizing the 15% reduction standard for MFL	Address issue	Yes

Table 2-3. Review of Chapter 1 – Introduction

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				evaluations universally across all rivers and springs in west-central Florida.		
14	AM	Page 5, Section 1.4.1		Significant harm standard –This is consistent with past MFLs established in the District and has been peer reviewed (was it 17 times). I continue to believe that it is reasonable and superior to a presumptive limitation. However, I am in agreement with panelist that the District should continue to work towards a more transparent and less presumptive methodology/standard. I note that Dr. Gore's initial suggest was, I believe, specific to the use of PHABSIM which measures fairly specific habit defined by substrate, velocity and depth. Since that time the standard has been used on an increasingly diverse range of habitat measures including ones defined by salinity, temperature, rooting zones, inundation etc.	Consideration for future action. No changes to current text requested	See panel comments in body of report.

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
15	SP	Figure 2-4	No	Figure 2-4. It would be beneficial to have the specific surface watershed unit on the map highlighted differently than the other HUCs shown.	Provide a different representation for the specific surface watershed than the other HUCs.	Yes
16	SP	Page 32, Section 2.3 Gage Data	No	Comment 1: A discussion of the depths of the system should be provided as its own section prior to this discussion. The depths are a key component of the system characteristics and play a role in the data presented in the Gage Data section. Comment 2: The data collection effort initiated for this project with the continuous gages provided a great deal of good data to help with the understanding of the overall system. I feel that more analyses of this data could be presented in the section that goes beyond just presenting what the time series are. The authors could use the data to better describe the system behavior. This helps generally with the MFL and leads into the modeling. This	Comment 1: Provide a discussion of depths prior to this section. Comment 2: Provide additional analyses of data to better describe this system. Comment 3: Include in this section or elsewhere in the report a final summary of the total SGD discharge and its distribution.	Yes

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				type of data assessment could also go in the hydrodynamic modeling appendix. Comment 3: While I am not sure if this is the right place for it, a section that provides a final summary of the total SGD discharge and its distribution needs to be in the report. There are a multitude of ways flow is being calculated from measurements, but no definitive presentation of the total time series is provided. It is also not fully clear if the same total flow time series is being used in the different analyses, i.e., for the hydrodynamic modeling versus the water quality evaluations. It is critical that they both use the same time series.		
17	SP	Pages 34 and 35, Table 2-3	No	The description of Table 2-3B is not fully accurate or clear. Max and Mins are presented in the table, but the label says average daily data. The available data for stage, specific conductance and temperature is more	Include more of the available data and revise title to reflect that.	Yes, addressed through further explanation in the text in the table title.

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				than just daily min/max. The full time series data are available. This is important relative to the hydrodynamic modeling.		
18	SP	Page 36, Paragraph 3	No	The Gulf of Mexico tides, which drive this station, are mixed diurnal and semi-diurnal in nature. This is a key aspect of Gulf tides that should be included in any discussion of water levels here. Also, the longer term astronomical tidal cycles and the wind driven impacts should be included.	Include discussion of importance of mixed diurnal and semi-diurnal tides as well as longer term astronomical tidal cycles and the wind driven impacts.	The requested discussion was not provided
19	SP	Page 37, Figure 2-16	No	There needs to be a better description of the nature of the field measurements of flow. Depending on when the measurements were taken and how they were or were not averaged, these values have little practical use as data depicting the flow. Rather they are used in the ultimate regressions or index velocity work. Presenting them here may have limited value and actually causes confusion	Provide a graph that better depicts and defines the measurements.	Yes
20	SP	Page 38, Figures 2-17 and 2-18	No	A longer record could be shown and still have it be readable. At least showing a	Revise the graph to show at least a 2-week	Yes

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				2-week cycle would allow observing the spring/neap aspects.	cycle that includes the spring/neap tides.	
21	SP	Page 45, Figure 2-24	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for Figure 2-17 regarding length of record.	Yes
22	SP	Page 46, Figure 2-25	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for Figure 2-17 regarding length of record.	Yes
23	SP	Page 52, Figure 2-30	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for Figure 2-17 regarding length of record.	Yes
24	SP	Page 57, Figures 2-34	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for Figure 2-17 regarding length of record.	Yes
25	SP	Page 63, Figures 2-38	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for Figure 2-17 regarding length of record.	Yes
26	SP	Page 68, Figures 2-42	No	Same comment as earlier relative to the period of the data to show.	Refer to action recommended for	Yes

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
					Figure 2-17 regarding length of record.	
27	DY	Page 36, Section 2.3.1	No	add psu to salinity statement "is from 1.7 to 2.5 **psu and** " 1.5 **psu** to highs of 2.5 **psu**"	Add to text	Yes
28	DY	Page 39, Section 2.3.1	No	add measurement units to table 2-4.	Add to table	Yes
29	DY	Page 42, Section 2.3.1	No	add psu to x axis of fig. 2-22	Add to figure	Yes
30	DY	Page 43, Section 2.3.2	No	add psu to salinity statement: "minimum of 0.5 **psu**"	Add to text	Yes
31	DY	Page 43, Section 2.3.2	No	average daily range in text is incorrect (1.7 psu to 2.5 psu)	Reword text	Yes
32	DY	Page 47, Section 2.3.2	No	add measurement units to table 2-5.	Add to text	Yes
33	DY	Page 49, Section 2.3.2	No	add psu to x axis of fig. 2-28.	Add to figure	Yes
34	DY	Page 50, Section 2.3.3	No	add psu to salinity statement: "between 3 **psu** and 5 **psu**"	Add to text	Yes
35	DY	Page 53, Section 2.3.3	No	add measurement units to table 2-6	Add to table	Yes
36	DY	Page 55, Section 2.3.3	No	add psu to x axis of fig. 2-33	Add to figure	Yes
37	DY	Page 56, Section 2.3.4	No	add psu to salinity statement: "around 2 **psu** and highs can approach 8 **psu**"	Add to text	Yes

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
38	DY	Page 59, Section 2.3.4	No	add psu to x axis of fig. 2-36	Add to figure	Yes
39	DY	Page 61, Section 2.3.5	No	add measurement units to table 2-7	Add to table	Yes
40	DY	Page 62, Section 2.3.6	No	add **psu** to each of salinity values in this section.	Add to text	Yes
41	DY	Page 64, Section 2.3.6	No	add measurement units to table 2-8.	Add to table	Yes
42	DY	Page 66, Section 2.3.6	No	add psu to x axis of fig. 2-41.	Add to figure	Yes
43	DY	Page 67, Section 2.3.7	No	add **psu** to each of salinity values in this section.	Add to text	Yes
44	DY	Page 70, Section 2.3.7	No	add psu to x axis of fig. 2-44.	Add to figure	Yes
45	AM	Page 32, Section 2	No	Gage data – The statement that the use of regression to extend gage records would "introduce additional uncertainty…a more powerful way to extend water level, flow, temperature and salinity data…is through surface water modeling" bothers me. I will defer to my fellow panelist who have greater expertise than I do with hydrodynamic modeling and I agree in specific cases with good data, such as the District has	Revise text	Yes

Table 2-4. Review of Chapter 2 – Physical Setting and Description of the Homosassa River System						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				on these rivers, mechanistic modeling offers benefits and is likely to be a much better choice but the generality of the statements bothers me I think the District should at least cite one paper or present some evidence for their selection of approach (which I do agree with).		

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
46	SP	Page 74, Paragraph 2	No	It should be clarified that just because a waterbody has been removed from the verified list because it has a TMDL does not mean that it is no longer impaired. The text here could make a reader think that FDEP feels the system is fixed. It is not.	Rephrase to clarify what being listed or delisted means in reference to the TMDL.	Yes
47	SP	Section 3.1.4	No	There should be some discussion of the levels of nitrate concentrations relative to the target listed here.	Add text	Yes
48	SP	Page 88, Figure 3-9	No	What are the stars? It is not apparent in the text or figure. While the gradient is clear in the P108 graph, it is not as clear in the UF graph.	Define what the stars mean. Clarify gradient in UF graph.	Yes
49	SP	Page 100, Figure 3-17	No	For this and other graphs does the criteria statistic (annual geomean, I believe) match the data analyses (average annual). If criteria are being put on graphs, it is important that the statistic be appropriate.	Verify that the criteria statistic matches the data analyses. Confirm that the statistic is appropriate.	Yes
50	SP	Page 105, paragraph 2	No	Although there is extensive of discussion relative to what is limiting, no analysis of the data to show which would be limiting is provided. If nitrogen is not limiting	Provide analysis of the data to show which would be limiting.	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				because it is so high, that does not mean it is not an issue.		
51	SP	Page 109, Paragraph 3, Sentence 4	No	While I understand the desire to compare the measured water quality against a standard, the authors should be careful in that specific spatial areas, temporal time periods, and statistics go with the standard. Comparison at individual stations rather than over the full WBID as is done in some figures is problematic. It would seem to show the system as being impaired (as in the top figure of 3-29). Need to be clear what the statistical analysis is along with clearly stating that no analyses presented are for the determination of impairment.	Identify what the statistical analysis is and with clarify that no analyses presented are for the determination of impairment.	Yes
52	SP	Page 113, Section 3.5.1 Flow Record for Water Quality Analysis	No	The base flow record used here needs to be the identical flow record used in other analyses, specifically the hydrodynamic modeling. Comments earlier outlined the need for a clear presentation of the final official base flow record of total SGD for this MFL, along with how those flows were distributed around the system. It is	Verify the flow record used.	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				not clear that everyone used the same record.		
53	SP	Section 3.5.2	Maybe	One aspect that is not discussed here is increasing salinity coming out of the vents (the combination of TDS) with decreasing flow. In the hydrodynamic modeling, the assumption is made that flow reductions would not result in an increase in the concentrations of salinity coming out of the vents, i.e., while flows at the upstream boundary conditions are decreased, the salinity levels remain the same as the baseline condition. This issue needs to be explored because that would impact the salinity habitat assessment, which is one of the factors that determined the MFL.	Include additional discussion of increased salinity concentrations in decreased flow from the vents.	Yes
54	SP	Page 116, Section 3.5.3 River Mainstem	No	The regression modeling presented here is a good way of looking at the relationship between flow and Chl a. The technical analyses are sound. Issues raised below in other comments address concerns around the use of the NNC standard, not the technical analyses.	No action needed	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
55	SP	Section 3.5.3	Maybe	While in the text there is qualifying language in the document. The use of the NNC outside of the spatial area, temporal range, and statistical method attached to it is not appropriate. The 7.7 µg/L value only has significance as an annual geometric mean within the WBID it applies to.	Consider an alternate approach to assessing the impacts of flow reduction or use the NNC as intended.	Yes
56	SP	Section 3.5.3	Maybe	Most of Sites 1 through 10 are not within the WBID that the standard applies to. This standard only has meaning in the WBID area.	See corrective action for comment 56	Yes
57	SP	Section 3.5.3	Maybe	These analyses compare what appears to be daily results against a standard that is an annual geomean. The 7.7 µg/L value has no meaning at these shorter temporal time scales.	See corrective action for comment 56	Yes
58	SP	Page 117, bottom paragraph	Maybe	While the qualifying statements are of value to make because they recognize the limitations in terms of comparison against criteria, it leaves open the concern that the MFL analyses did not address the issue of flow reductions on this aspect of water quality. If reduced flows result in a violation of the	See corrective action for comment 56	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				downstream water quality standard, and that allowable flow reduction was below the others established for different metrics, the MFL would need to be set on this basis. As it stands, the qualifying language does not provide for that assessment. This limitation needs to be discussed in the context of the ultimate MFL determination sections.		
59	SP	Section 3.5.3	Maybe	The regression-type modeling presented here is similar to approaches utilized by FDEP for the establishment of TMDLs. The regressions are no less technically sound than ones used by FDEP. As such, it would seem that, if used appropriately relative to the spatial and temporal constraints of the criteria, they could assess the potential impacts of flow withdrawal on future violations of the NNC for Chl *a*.	See corrective action for 56	Yes
60	SP	Page 120, Figure 3-32	No	Exceedance of criteria is not a habitat, therefore, the use of the 15% harm criteria seems to extend its use too far.	See corrective action for 56	Yes
61	DY	Pages 73-123	Maybe	Neither the report nor supporting documents reviewed adequately address	Address issue	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				if salinity in the springs that discharge to Homosassa Rivers will change in response to changes in groundwater pumping in the Northern District. Temporal changes in quantity and quality of flow from individual vents needs to be better understood and warrant further consideration. Salinity changes in springs are important because the mineral content of springs with naturally higher salinity can have an influence on biological diversity within their waters and is therefore important to consider when evaluating their ecological health (FDEP, Springs Initiative Report). High water clarity is a primary driver of the productive aquatic vegetation which supports spring ecosystems (SWFWMD-web Springs Dashboard). My question--Will higher salinity concentrations reduce water clarity?		
62	DY	Page 114, Section 3.5.2	No	What are classified as "harmful constituents"?	Provide further explanation	Yes
63	DY	Page 114, Section 3.5.2	Maybe	Why wasn't water clarity assessed?	Address issue.	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
64	DY	Page 114, Section 3.5.2	Maybe	Temporal changes in quantity and quality of flow from individual vents needs to be better understood and warrant further consideration. My question--Will higher salinity concentrations reduce water clarity?	Address issue	Yes
65	DY	Page 115, Section 3.5.2	Maybe	Nutrient loading has been on ongoing problem for decades. Steps have been done to mitigate the problem, however elevated nutrient levels continue to be a principal threat to the environmental integrity (ecosystems) of the Chassahowitzka River System. Therefore, for this spring-based flow system, nutrient loading is relevant to the MFL in that it can lead to vegetation changes which in turn could lead to hydrologic changes. Several of the springs discharging to the Chassahowitzka River were placed on the verified impaired list for nutrients based on the presence of algal mats. Moreover, an unintended consequence of decreased flow volumes is it may lead to temporal issues related to residence	Provide further discussion explaining why nutrient loading is not a hydrologic issue	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				time for nutrients within specific habitats. While there is no statistically significant correlation between flow and nitrate concentrations, the mathematical relation between loads and flows state that if loadings do not change, concentrations will be increased as flows decrease.		
66	AM	General Comment		The water quality analysis in these reports are extensive and fairly complete and the continued effort to understand the coastal systems is evident. I like the way you explore relationships with space, time and flow in separate sections. Flow is of course what you are regulating. Should 3.5 be organized like 3.3 and 3.4?	The author should consider revising the text for consistency and readability.	Yes
67	AM	Page 116, Section 3.5.3		These pages note that Chlorophyll is a function of many factors. It also discusses in a new way(? New to me for the district) for the District the potential use of a water NNC as a means of limiting flow. While the discussion of NNC is interesting it has perhaps resulted in ignoring other characteristics of Chlorophyll. Discussion with	Provide further discussion of water clarity as it relates to flow and discuss fully assumptions made about relationships with clarity and other comports such as chlorophyll. This	Yes

Table 2-5. Review of Chapter 3 – Water Quality Characteristics and Relationships With Flow						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				stakeholders suggest that water clarity is a concern and is a component of one of the 10 environmental values (aesthetics and scenic value). Chlorophyll is related to clarity and flow and residence time are components of Chlorophyll growth. This was a discussion during the Kings Bay Crystal River MFL. The report would benefit from further discussion of water clarity as it relates to Chlorophyll and any presumptions that were made based on the NNC. Further if chlorophyll is not the major constituent of reduced clarity that would warrant discussion as well.	might be done in relation to the WRV for aesthetics and scenic attributes.	

Table 2-6. Review of Chapter 4 – Biological Status and Trends Evaluation for the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
68	DY		No	No comments or questions identified in this section of the report.	No action required	No action required
69	AM	Page 137, Section 4.2.3		SAV – The District states that annual variability is expected in these coastal spring feed systems and I agree narrowly with that statement. Storm (scour and salinity) can alter compositions significantly and higher salinities caused by low flow conditions can also cause alterations. Still the changed from the early 2000's to 2010 and the observations from 2015 (ATM 2016) show considerable change. The District correctly points out that seasonal variability exist and that discontinuous sampling may miss important patterns in community composition, biomass and area coverage. *Question - Does this than mean that the data is of little use if not collected more continuously? It suggest to me that for the purposes of re-evaluation a single study preformed just prior to re-evaluation may be of limited value and*	The District should consider for future studies if routine monitor of SAVs in these coastal systems is more appropriate than a sequence of discontinuous studies and weigh the usefulness of the information against the cost.	Yes

Table 2-6. Review of Chapter 4 – Biological Status and Trends Evaluation for the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				the District should consider the value of more continuous monitoring along these coastal spring feed rivers. It might especially consider this in like rivers on the priority list for development or reevaluation. We note that the District has a contract for twice-a-year fish sampling with the FWC in both rivers. Are the fish indicators more valuable or simply are they more obtainable at a reasonable cost?		
70	AM	Page 126, Section 4.1.4		There is a subheading of "shoreline and emergent vegetation" with no number and no second subsection.	No action required	Yes
71	AM	Page 143, Section 4.2.3		No relationship found between flow and Blue Crab quantity. However, we note the Districts willingness to examine new metrics of interest and consider information for possible inclusion into MFLs as they become available.	No action required	Yes
72	AM	Page 154, Section 4.3.1		The District has continued to sample fish during the period approaching re-evaluation. This commitment to continuously improve/increase the available data is commendable.	No action required	Yes

Table 2-6. Review of Chapter 4 – Biological Status and Trends Evaluation for the Homosassa River System

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
73	AM	Page 172, Section 4.4		Manatee – Thermal arguments consistent with prior reports and originally used by SJRWMD. Consistent and remains reasonable.	Request increased discussion in report.	Yes
74	AM	Page 176, Section 4.5		Snook – Common in both rivers (under 8th and 3rd and 3 and 8.6% total catch) and a popular gamefish. Have a 10-15 degree celsius threshold. Note more abundant in north now and so are red mangrove. <u>Request for increased discussion in the report</u>: Habitat size was the metric considered for Snook which differs some form the way it was evaluated for Manatee. The 2010 winter is evidence of the need for thermal refuge and I support the species specific standards since we happen to know allot about the common game fish. But I did not see where the need for excess capacity was explicitly discussed. The Snook standard invites comparison to the Manatee standard. The rational for the		Yes

Table 2-6. Review of Chapter 4 – Biological Status and Trends Evaluation for the Homosassa River System						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				difference in application should be discussed.		

Table 2-7. Review of Chapter 5 – Hydrologic Evaluation of the Homosassa River Watershed						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
75	DY	Page 97, Section 5.4.1	No	Based on my review of the supporting technical documents including the Anderson and Stewart (2016) review, the groundwater flow model is conceptualized appropriately and meets accepted model calibration standards. Although the aquifer system is more complex (flow system is neither isotropic nor homogenous) than the model assumptions inherent using the selected MODFLOW packages utilized; the abundant occurrence of secondary porosity features does not invalidate usage of the equivalent porous medium model for simulating average annual regional groundwater flow over the model domain. The model as developed is a useful tool for the District to evaluate regional changes in stress to the system for annual, monthly, or seasonal average conditions.	No action required	No action required
76	DY	Page 198, Section 5.4.1	No	Suggest adding text to address potential dual porosity criticism of the selected model code. Something like:	Add to text	Yes

Table 2-7. Review of Chapter 5 – Hydrologic Evaluation of the Homosassa River Watershed						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				The assumption that groundwater flow in the Floridan aquifer system can be approximated as laminar flow and represented as a porous medium in MODFLOW is applicable at the scale of the NDM5 grid spacing (2,500 feet x 2,500 feet discretization). Based on a comparison of the application of the MODFLOW Conduit Flow Package and a standard MODFLOW application at Wakulla Springs by Kuniansky (2016), the assumption that the standard MODFLOW porous medium approach is applicable throughout the NDM5 model domain is reasonable.		
77	DY	Page 197, Section 5.4.1	No	Suggest adding the peer report by Anderson and Stewart (2016) to appendices.	Add to report	Yes

Table 2-8. Review of Chapter 6 – Model Results

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
78	SP	Section 6.3 LAMFE Modeling	No	The District developed this model and it is not used outside of the District. More discussion and documentation of testing of the model should be provided.	Provide additional discussion and documentation of the testing of the model.	Yes
79	SP	Section 6.3 and the modeling report.	No	The upstream boundary conditions used in the model, specifically the individual flows from the vents and the salinities and temperatures, should be better documented. This can be done in the modeling report.	Improve the presentation of the boundary conditions in the modeling report.	Yes
80	SP	Section 6.3 and the modeling report	Maybe	The regressions utilized in the boundary conditions for the Salt River and Mason's Creek at times do not appear to accurately simulate measured data in those areas. Need to address this issue	Perform sensitivity analyses on these boundary conditions to determine if they have the potential to impact the overall simulation of the salinities	Yes
81	SP	Page 209, Paragraph 2	Maybe	Earlier comments on the potential changes in salinity in the vents under reduced flow scenarios need to be addressed here. The model assumes no change.	Define potential changes or perform sensitivity analyses to show no impact on the MFL	Yes
82	DY	Page 208, Section 6.3	Maybe	For transparency, supporting documentation is needed to explain the District's selection of LAMFE. Need to	Address all issues. The report and/or appendices must be	Yes

Table 2-8. Review of Chapter 6 – Model Results

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				show the flow/salinity values for all tributaries for the simulation/verification periods. What method was used to estimate the salinity and flow boundary conditions for the tributary springs in the model? How were boundary salinities and flows adjusted when simulating sea level rise? What is the error and accuracy of the input data? Sensitivity analyses are needed to address the sensitivity of the downstream, upstream, and lateral salinity or temperature boundary conditions. Additionally, uncertainty analyses are needed otherwise the precision and magnitude of possible error in salinity or temperature model prediction results are unquantified. For example, if the threshold refuge temperature is 15 ºC, are temperatures of 16 ºC and 14 ºC different enough to be outside or within the allowable threshold?	complete in assessing the uncertainty and sensitivity associated with the LAMFE model results and the errors and accuracy in the various steps and how those might impact the final flow calculation	
83	DY	Page 208, Section 6.3	No	Flow and salinity inputs for all simulations must be reported.	Add data to report	Yes

Table 2-8. Review of Chapter 6 – Model Results

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
84	DY	Page 208, Section 6.3	No	Suggest edit--change "were tuned" to "were adjusted". I thought musical instruments are tuned.	Suggest reword	Yes
85	DY	Page 208, Section 6.3	No	The statement "*accurately predict measured values*" is misleading. The model simulates values and the modeler subjectively assesses the simulation accuracy. What is meant by "*accurately*"?	Clarify	Yes
86	DY	Page 208, Section 6.3	No	Need to show the relation between flow at SE Fork and Halls River and the flow/salinity values for Hidden River for all simulation periods.	Provide relation and data	Yes
87	DY	Page 212, Table 6.3	No	Table title needs to include the dates of the statistical analyses. Why no statistics included for calibration period?	Add time period used in analyses	Yes
88	DY	Page 213, Tables 6-4 and 6-5	Maybe	What is the error associated with the simulated values?	Document the error associated with these estimates	Yes, based on sensitivity analyses of salinity in SGD.
89	AM	General		See Manatee/Snook comments above…They could be addressed here but I think chapter 5 is better.		Yes

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
90	SP	Section 7.1	Maybe	Comments provided earlier on changes in upstream salinity boundaries under reduced flow conditions may impact the overall MFL.	See previous corrective action.	Yes
912	SP	Page 215, Bottom Paragraph, Last two sentences.	Maybe	While salinity and temperature are important aspects, for this system, at the moment, water quality seems to be the most important aspect. As such, this section should have more discussion of the system's present state (impaired) and what the MFL was and was not able to evaluate relative to water quality, specifically, the increasing nitrates, impacts of flow on filamentous algal growth, impacts on clarity.	Provide additional text.	Yes
92	SP	Page 218, Paragraph 1, Sentences 3 and 4	No	This section does not address the potential impacts of nitrate concentrations on the filamentous algae. This is the reason FDEP listed the upper sections as impaired and why there is a TMDL. If filamentous algae is being	Add text.	Yes

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				discussed, this aspect needs to be included, even if it is a recognition of the uncertainty and lack of data.		
93	SP	Page 218, Section 7.2.9 Water Quality	No	Comments made in the water quality section identified some potential issues with how the criteria were utilized. Also, water quality is such an important aspect of this system at the moment, so this section would seem to need a more complete discussion.	Provide additional text and address previous issues with water quality assessments.	Yes
94	DY	Page 215, Section 7.1	No	Add River System to chapter title— Should read "Minimum Flows Recommended for the Homosassa River System".	Add to text	Yes
95	DY	Page 215, Section 7.1	Maybe	What is the uncertainty associated with the 5% LAMFE model prediction?	Quantify the uncertainty associated with this prediction	Yes, based on sensitivity analyses of salinity in SGD rather than full uncertainty analyses
96	DY	Page 215, Section 7.1	No	The statement "*Likewise, water quality parameters are stable*" may not be true.	Address issue	Yes

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				Specific conductance in spring waters have increased since the 1960's.		
97	DY	Page 215, Section 7.1	No	Not sure of the meaning of this statement "*confidence in the criteria associated with the hydrodynamic model modeling results is proportional to verification statistics shown in Table 6.2*". First, what "criteria associated with the model" are you referring to? Second, verification helps to establish greater confidence in the calibration but how is it proportional to verification statistics?	Clarify	Yes
98	DY	Page 219, Section 7.3	Maybe	"*Results from this current reevaluation of the Homosassa River System therefore indicate an appropriate minimum flow could be established at 95% of unimpacted flows*". Once again, what is the uncertainty associated with this prediction value?	Quantify the uncertainty associated with this prediction.	Yes, based on sensitivity analyses of salinity in SGD rather than full uncertainty analyses
99	DY	Page 219, Section 7.3	Yes	The District MFL report has (1) provided a thorough and extensive discussion of the rationale of the minimum flow recommendations for the Homosassa River System; and (2) successfully met	Consider recommendation	Yes

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				the requirements of the statute--to consider *multiple natural resource values (WRVs)*, and limit flow reduction resulting in no "*significant harm*" to water resources and ecology of the system. However, I believe the District should consider a more conservative "*appropriate minimum flow*" since currently (1) there are no uncertainty analyses of model results (2) no analyses of confidence levels associated with "*significant harm*" being applied, and (3) no better hydrologic data for improved understanding relation between salinity for both saline and freshwater springs caused by groundwater withdrawals and/or sea level rises.		
100	DY	Page 222, Section 7.4	Maybe	Was the effect of sea level rise on salinity changes of springs due to movement of the saltwater-freshwater interface in the Upper Floridan aquifer assessed?	Address issue	Yes, based on sensitivity analyses of salinity in SGD rather than full

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa

Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
						uncertainty analyses
101	AM	Page 215, Section 7.1		Consider editing or clarifying: Both reports state in the third paragraph that "Biological components of the system, including fish communities, vegetation and oysters are stable". This was not at all my impression of vegetative communities gained from the report (Chapter 4.2.3). Specifically SAV was not demonstrated to be stable but actually shown to be quite variable. Some vegetative communities are stable but stakeholders express considerable concern over SAV in the public kickoff meeting and there is at least some concern about SAV assemblages.	Additional discussion in report.	Yes
102	AM	Page 218, Section 7.2.6		Please explain more thoughlly: "The presence of filamentous algae is driven by…salinity and light availability (which in turn is driven by water levels). Salinity and water levels are predicted by the hydrodynamic mode, and thus the effects of flow reductions on algae have	Please add additional information in the report about how filamentous algae responds to flow and how that response was considered in setting the MFL.	Yes

Table 2-9. Review of Chapter 7 – Minimum Flows Recommendation for Homosassa						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				been considered through the hydrodynamic modeling effort."		

Table 2-10. Review of Appendix 6 – Chen, XinJian. 2018. Hydrodynamic modeling of effects of flow reduction on salinity and thermal habitats in the Homosassa River						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
103	SP	Section 2	No	The data that was collected to support the development was very comprehensive. The report would benefit from additional analyses of the data to describe how the system hydrodynamics behave prior to jumping into the modeling. This would strengthen the overall report and confidence in the model by showing it can simulate the characteristics seen in the data.	Provide more analyses of the data to describe the hydrodynamic characteristics of the system.	Yes
104	SP	Section 2 or 3	No	A presentation of the depth data and how it was input into the model needs to be provided. Depths are a critical component of the model development	Add section discussing depth data sources and how they were input to the model.	Yes
105	SP	Section 3.1	Maybe	The regressions utilized for the Salt Creek and Mason's Creek boundary conditions at times do not agree that well with the data. Need to demonstrate that the impact the errors here may have on the ultimate MFL results.	Do some sensitivity testing of these boundaries.	Yes
106	SP	General	No	Some of the graphs are hard to read through the report. Also, the	Make figure presentation changes	Yes

Table 2-10. Review of Appendix 6 – Chen, XinJian. 2018. Hydrodynamic modeling of effects of flow reduction on salinity and thermal habitats in the Homosassa River						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				use of the hours along the x-axes makes knowing where the results are in the simulation period difficult. This is not a major issue, but changing these would improve the report.		
107	SP	Section 3.1	No	The documentation of the upstream boundary conditions are not sufficient. Need a map showing where the flow, salinity, and temperature inputs are going in. It is also good to show some of the time series of the boundary conditions, not just descriptions.	Add more documentation of the boundary conditions.	Yes
108	SP	Section 3.3	No	Some of the stations that were presented as calibration stations (for salinity and temperature) were also used as the boundary conditions. Generally, it is not appropriate to include in your calibration statistics stations that were also used as boundary conditions. The lack of documentation of the boundary	Remove data that are used as boundary condition inputs from the statistical and graphical comparisons.	Yes

Table 2-10. Review of Appendix 6 – Chen, XinJian. 2018. Hydrodynamic modeling of effects of flow reduction on salinity and thermal habitats in the Homosassa River						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				conditions limits the full determination of this issue.		
109	SP	Section 3.3	No	Should add RMS error to the statistics	Revise the text.	Yes
110	DY		Yes	See earlier comments on LAMFE model documentation in Review of Sections 6 and 7.	See earlier recommendations	See earlier response.

Table 2-11. Review of Appendix 7 – Janicki Environmental, Inc. and WSP, Inc. 2018. Exploratory Evaluation of Water Quality and Flow Relationships for the Homosassa River in Support of Minimum Flows Reevaluation						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
111	SP	Page ii, Paragraph 4	No	Some mention should be made of the known relationship between residence time and Chl *a* levels in systems as this is the most likely cause	Revise text to include discussion of known relationship between residence time and Chl *a* levels in systems.	Yes
112	SP	Page iii, Paragraph 1, Last sentence	No	It would be good to specifically state what the criteria are that govern each section, i.e., the nitrate concentration for the headwater and the NNC for Chl a, TN, and TP for the downstream portions.	Include criteria.	Yes
113	SP	Page iii, Paragraph 2, Sentences 1 and 2	No	It is somewhat dangerous to apply the Chl *a* standard in any other way than which it was derived for, i.e., as an annual geometric mean. The value 7.9 has no meaning in any other context and as such should not be a trigger.	Revise text.	Yes
114	SP	Page iii, Paragraph 3, Last two sentences	No	Looking at a 15% change in sample exceedance over the 7.9 criteria is not an appropriate way to assess water quality impacts. There are specific temporal and spatial ways that the standard should be applied	Revise text.	Yes

Table 2-11. Review of Appendix 7 – Janicki Environmental, Inc. and WSP, Inc. 2018. Exploratory Evaluation of Water Quality and Flow Relationships for the Homosassa River in Support of Minimum Flows Reevaluation						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
				when using a model of this type and what was done is may not be consistent with it.		
115	SP	Page iii, Paragraph 4, First two sentences	No	As stated earlier, the 7.9 ug/L has no meaning other than within its context as a standard for an annual geometric mean. Also, violations of a standard are not a resource and, therefore, not really what the 15% criteria was designed for.	Revise text.	Yes
116	SP	Page 3-2, Paragraph 1, Last sentence	No	Verify what was the final flow time series that was used to define the MFL, i.e., for this water quality analyses. Clarify consistency between the different analyses.	Verify data and revise text.	Yes
117	SP	Page 3-3, Paragraph 1	No	Which time series was ultimately used and over what time? Full period of record? Based on the label on the statistical Figure 3-3, it looks like daily flow. How far back does it go and, if before the time of the variation, is it reliable.	Verify data and revise text.	Yes

Table 2-11. Review of Appendix 7 – Janicki Environmental, Inc. and WSP, Inc. 2018. Exploratory Evaluation of Water Quality and Flow Relationships for the Homosassa River in Support of Minimum Flows Reevaluation						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
118	SP	Page 3-12, Paragraph 1	No	The discussion here is not sufficient relative to developing an understanding of issues in the springs. Nitrate-nitrite is the key constituent of concern at the spring head. No plots have been provided. Also, no mention of the standard is provided. The site-specific standard for nitrates is 0.23 mg/L. Nitrates are well above this and, based on some of the data, are rising.	Provide additional discussion on nitrate-nitrite.	Yes
119	SP	Page 4-1, Paragraph 2, Sentence 4	No	Violations of criteria are not a beneficial attribute or a resource of concern, therefore, it should not be assessed using the 15% criteria.	Revise text.	Yes
120	SP	Page 4-4, Figure 4-2	Maybe	This analysis appears to determine the flow reduction that would result in a 15% increase in the daily exceedance of the Chl *a* criterion. The criteria are an annual geomean, therefore the exceedance has no meaning.	Consider different ways to assess the impacts on water quality using the regression models. The models and regressions are technically strong, it is	Yes

Table 2-11. Review of Appendix 7 – Janicki Environmental, Inc. and WSP, Inc. 2018. Exploratory Evaluation of Water Quality and Flow Relationships for the Homosassa River in Support of Minimum Flows Reevaluation						
Comment No.	Peer Reviewer	Figure, Table, or Page and Paragraph Number	Does Comment Directly and Materially Affect Conclusions of Report? (Yes/No)	To be completed by Reviewer(s)		
				A. Reviewer's Specific Comments	B. Reviewer's Specific Recommended Corrective Action	C. Comment Resolved?
					the use of them against the criteria that is problematic.	
121	SP	Figure 4-5	No	This figure is problematic in that it appears to show that the system is impaired, when per FDEP the lower WBID is not. The graph shows the annual geomean of the data analyzed is above the criteria for two years in a row, which would trigger an impairment. The main report and this report clearly state that the analyses are not meant to be an official assessment of impairment, but this figure illustrates the danger of using the criteria but not doing it fully in the way FDEP would do it.	See recommended corrective action for 118	Yes

3.0 SUMMARY OF FINDINGS AND MFL REVIEW GUIDELINES RESPONSE

A component of the Peer Review Panel scope of work was to provide an assessment of the MFL report and supporting documentation against specific criteria provided by SWFWMD. The following outlines those specific criteria.

1. Conclusions: Determine whether the conclusions in the Homosassa River/Homosassa Spring Group minimum flow report are supported by the analyses presented.
2. Supporting Data and Information: Review the relevant data, and information that support the conclusions made in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:
    a. The data and information used were properly collected;
    b. Reasonable quality assurance assessments were performed on the data and information
    c. Exclusion of available data from analyses was justified; and
    d. The data used were the best information available.
3. Technical Assumptions: Review the technical assumptions inherent to the analyses used in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:
    a. The assumptions are clearly stated, reasonable and consistent with the best information available;
    b. The assumptions were eliminated to the extent possible, based on available information; and
    c. Other analyses that would require fewer assumptions but provide comparable or better results are available.
4. Procedures and Analyses: Review the procedures and analyses used in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:
    a. The procedures and analyses were appropriate and reasonable, based on the best information available;
    b. The procedures and analyses incorporate all necessary factors;
    c. The procedures and analyses were correctly applied;
    d. Limitations and imprecisions in the information were reasonably handled;

e. The procedures and analyses are repeatable; and
f. Conclusions based on the procedures and analyses are supported by the data.

5. If a proposed method used in the Homosassa River/Homosassa Spring Group minimum flow report is not scientifically reasonable, the Peer Review Panel shall:
    a. List and describe scientific deficiencies and, if possible, evaluate the error associated with the deficiencies; and
    b. determine if the identified deficiencies can be remedied.
    c. If the identified deficiencies can be remedied, then describe the necessary remedies and an estimate of time and effort required to develop and implement each remedy.
    d. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable. If an alternative method is identified, provide a qualitative assessment of the relative strengths and weaknesses of the alternative method(s) and the effort required to collect data necessary for implementation of the alternative methods.
6. If a given method or analysis used in the Homosassa River/Homosassa Spring Group minimum flow report is scientifically reasonable, but an alternative method is preferable, the Peer Review Panel shall:
    a. List and describe the alternative scientifically reasonable method(s) and include a qualitative assessment of the effort required to collect data necessary for implementation of the alternative method(s).

The conclusions outlined in Table 3-1 reflect the final MFL Documents and supporting documentation that was provided throughout the peer review process, including supporting documentation and analyses provided following submittal of the Initial Peer Review Support as part of the District responses.

Task	Subtask	Panel Responses
1. Conclusions: Determine whether the conclusions in the Homosassa River/Homosassa Spring Group minimum flow report are supported by the analyses presented.		The Panel determined that the MFL conclusions relative to the allowable flow reductions are supported by the analyses presented.
2. Supporting Data and Information: Review the relevant data, and information that support the conclusions made in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:	a. The data and information used were properly collected;	The Panel determined that data collected by the SWFWMD for this project appears to have been collected properly. Also, the data from outside groups appears to have been collected properly based on existing protocols.
	b. Reasonable quality assurance assessments were performed on the data and information	The Panel determined that reasonable quality assurance assessments were performed on the data.
	c. Exclusion of available data from analyses was justified; and	The Panel did not see where any specific data were excluded
	d. The data used were the best information available.	The Panel determined, based on their review of the reports and supporting information, that the District utilized the best available information and data.
3. Technical Assumptions: Review the technical assumptions inherent to the analyses used in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:	a. The assumptions are clearly stated, reasonable and consistent with the best information available;	The Panel determined that assumptions made in the reports are clearly stated, reasonable, and consistent with the best available information.

Task	Subtask	Panel Responses
	b. The assumptions were eliminated to the extent possible, based on available information; and	The Panel did not identify any unjustified assumption eliminations.
	c. Other analyses that would require fewer assumptions but provide comparable or better results are available.	The Panel did not identify any alternate analyses that would require fewer assumptions
4. Procedures and Analyses: Review the procedures and analyses used in the Homosassa River/Homosassa Spring Group minimum flow report to determine whether:	a. The procedures and analyses were appropriate and reasonable, based on the best information available;	The Panel determined that the procedures and analyses were appropriate and reasonable, based on the best available information.
	b. The procedures and analyses incorporate all necessary factors;	The Panel determined that the procedures and analyses utilized by the District incorporated all necessary factors.
	c. The procedures and analyses were correctly applied;	The Panel determined that the procedures and analyses were correctly applied.
	d. Limitations and imprecisions in the information were reasonably handled;	The Panel determined that the limitations and imprecisions were reasonably handled.
	e. The procedures and analyses are repeatable; and	The Panel determined that the procedures and analyses seem repeatable.
	f. Conclusions based on the procedures and analyses are supported by the data.	The Panel determined that the conclusions reached were supported by the data available.

Task	Subtask	Panel Responses
5. If a proposed method used in the Homosassa River/Homosassa Spring Group minimum flow report is not scientifically reasonable, the Peer Review Panel shall:	a. List and describe scientific deficiencies and, if possible, evaluate the error associated with the deficiencies;	No specific deficiencies were identified based on presently available data
	b. Determine if the identified deficiencies can be remedied.	As no deficiencies were identified in a. no remedy needed
	c. If the identified deficiencies can be remedied, then describe the necessary remedies and an estimate of time and effort required to develop and implement each remedy.	As no deficiencies were identified in a. no response required.
	d. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are scientifically reasonable. If an alternative method is identified, provide a qualitative assessment of the relative strengths and weaknesses of the alternative method(s) and the effort required to collect data necessary for implementation of the alternative methods.	As no deficiencies were identified, no response needed.

Task	Subtask	Panel Responses
6. If a given method or analysis used in the Homosassa River/Homosassa Spring Group minimum flow report is scientifically reasonable, but an alternative method is preferable, the Peer Review Panel shall:	a. List and describe the alternative scientifically reasonable method(s), and include a qualitative assessment of the effort required to collect data necessary for implementation of the alternative method(s).	No alternative methods have been identified by the panel in this report.

4.0 REFERENCED LITERATURE

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Response to Final Peer Review

Reevaluation of Minimum Flows for the Homosassa River System

July 26, 2019

Southwest Florida Water Management District
Brooksville, Florida 34604-6899

Gabe Herrick, XinJian Chen, Chris Anastasiou, Ron Basso, Natasha Mendez-Ferrer, Nicole Ortega, Danielle Rogers, and Doug Leeper

EXECUTIVE SUMMARY

This document summarizes Southwest Florida Water Management District staff responses to the Final Peer Review – Reevaluation of Minimum Flows for the Homosassa River System completed for the District in June 2019. The Final Peer Review Report was prepared by a peer review panel (Panel) composed of Steven Peene, Dann Yobbi and Adam Munson.

The peer review for this MFL was conducted in two phases. The first phase was an initial peer review that culminated in recommendations for changes to the report documentation and analyses and provided initial conclusions on the technical defensibility of the MFL. The initial conclusions and recommendations were included within a report entitled “Initial Peer Review – Re-evaluation of Minimum Flows for the Homosassa River System”. Following submittal of the Initial Peer Review Report, District staff made revisions which resulted in a Final MFL Report. In addition to revising the MFL report, appendices were updated, two new appendices were composed (nos. 11 and 12), and a response document was developed in response to the recommendations in the Initial Peer Review Report. Following review of these updated and new documents by the Peer Review Panel, the District held three teleconferences to discuss these new and newly revised documents with the Panel. Based on review these documents and discussions during teleconferences, the Panel produced a Final Peer Review Report. This Final District Response summarizes initial responses to the Initial Peer Review Report as well as responses to the Final Peer Review Report.

The Final Peer Review Report supports the Final MFL Report by stating: “Overall, the Peer Review Panel supports the conclusions presented within the MFL report and the use of the thermal habitat for snook as the primary metric. A key component of the MFL analyses, the hydrodynamic model, was generally found to be sufficiently developed and calibrated for use in evaluating the changes in the temperature and salinity as a function of submarine groundwater discharge (SGD).”

Key recommendations in the Initial Peer Review Report focused on: appropriateness of the 15 percent harm standard as a threshold for significant harm, documentation of the time series of submerged groundwater discharge, hydrodynamic model documentation, and methods for addressing water quality with respect to existing criteria. All of these key recommendations were addressed by District staff to the satisfaction of the Peer Review Panel.

The Final Peer Review Report confirms that the District response to comments, changes to the Initial MFL Report culminating in the Final MFL Report, and additional documentation provided full resolution to all issues raised by the panel: “Based on the District responses to comments, additional technical documentation, and the updated documents, no unresolved recommendations remain.”

RESPONSES TO GENERAL COMMENTS

In the Initial Peer Review Report, the Panel identified key comments/recommendations to improve the MFL report, supporting documentation, and associated analyses. In the Final Peer Review Report, the Panel determined that all comments/recommendations were adequately addressed. General comments addressed:

- The significant harm threshold of 15 percent habitat change
- Determination of the SGD
- Groundwater modeling
- Saltwater in springs
- Hydrodynamic modeling
- Water quality analyses
- Biological communities

Significant Harm Threshold

Summary of Final Panel Comments

"The determination made by the panel is that at this time the 15% change criteria is the best available approach to the determination of the allowable MFLs for the Homosassa system. A recommendation is made for the District to perform a re-evaluation of the 15% criteria outside of any specific MFL peer review process." (p. 2-3)

Initial Response

We agree with the Panel that use of 15% change in habitat or resource criteria is superior to the use of presumptive flow-based criteria for minimum flow development, and also agree with their determination that "at this time, there is not a better alternative approach or criterion" that could be used for establishment of revised minimum flows for the Chassahowitzka and Homosassa river systems. Furthermore, we are pleased to note that the Panel indicated that the percent-of-change standards the District has used are under consideration or being used by other water management districts within the state and elsewhere by other regulatory groups.

We believe the District has transparently acknowledged that the use of 15% change-based standards is a reasonable, habitat or resource-based approach for identifying significant harm, that can be used in lieu of or in conjunction with specific breakpoint or threshold-based criteria that may be available or applicable to individual water bodies or resources. We further note that application of the percent-of-change approach addresses the sensitivity of individual systems to changes in flow when the change criteria are based on habitat or resource changes, as exemplified by the differing minimum flows proposed for the Chassahowitzka and Homosassa river systems, and the differing minimum flows that have been established for other lotic systems within the District using the approach.

With regard to Panel comments about uncertainty associated with use of the 15% change criteria for minimum flow development, we believe that environmental limits such as minimum flows and levels should be expressed as simple values and should not include error bars or confidence intervals. We also note that for the Chassahowitzka and Homosassa river systems, and for minimum flows development in general, our approach involves consideration of multiple percentage-change responses (for various salinity-based habitats or zones, manatee thermal-habitats, etc.) and selection or identification of the most sensitive 15% change criterion. Through this approach, we attempt to mitigate for uncertainty that may be associated with each individual response or criterion.

We do, however, always attempt to characterize and minimize uncertainty and improve the accuracy and quality of all data sets and tools used for minimum flow and level development. To further these efforts, we welcome the Panel's specific input or suggestions for additional characterization, testing, and quantification of uncertainty that could improve our use of habitat or resource based 15% change criteria or other types of criteria employed for minimum flow development.

Finally, we have several responses to the Panel's recommendation (concerning 15% change criteria) that the District "needs to commit to the assessment needed to determine whether this criterion is truly protective of individual resources within the Homosassa River/ Homosassa Spring Group and other similar systems." First, we note that the District has and will continue to support extensive and comprehensive data collection/monitoring efforts for characterization of the status of the Chassahowitzka and Homosassa river systems and other water bodies throughout the District, including those with and without established minimum flows and levels. For minimum flow and level water bodies, these efforts have and will continue to support annual and five-year status assessments that help ensure that adopted minimum flows and levels continue to be met, or where necessary are recovered. We also note that the District has and will continue to assess and develop appropriate significant change criteria that can be used to support minimum flow and level development. As appropriate, any newly developed or identified criteria will be used for the planned reevaluations of the Chassahowitzka and Homosassa river systems.

Final Response

The determination of significant harm has been extensively researched by District staff and will continue to be researched with every minimum flows evaluation. Summarizing the initial comments above, the 15% change standard is sensitive to differences among systems, takes into account representative and unique physical, chemical, and biological features of each system, represents the best use of available data to protect these systems, and is a reasonable, well-documented approach with no superior alternatives.

Determination of Submarine Groundwater Discharge

Summary of Final Panel Comments

"Based on these updates to the reports, the issues identified relative to the SGD documentation have been addressed." (p. 2-4)

Initial Response

The hydrodynamic model report (included as an appendix to the minimum flows report) includes new details on estimation methods for tributary submarine groundwater discharge (SGD) as inputs to the model.

Final Response

The panel has no outstanding issues and District staff have no further comment on this topic.

Groundwater Modeling

Summary of Final Panel Comments

This section did not require action by the District for response.

Initial Response

Thank you for your comments, individual issues are addressed below.

Final Response

No response required.

Saltwater in Springs

Summary of Final Panel Comments

“The panel agrees with the District’s conclusion that an analysis of region-wide changes in groundwater salinity in response to groundwater pumping is not possible at this time because the data are ‘not suitable for analysis’. However, the panel does not fully agree with the conclusion that ‘there is no evidence that a flow reduction will cause an increase of salinity’ ” (p. 2-5). The Panel concludes that “this is an important area of uncertainty in the present MFL analyses and future work should focus on providing more data to make a final determination on the potential for salinity increases in the SGDs.” (p. 2-6)

Initial Response

Based in part on the need to monitor springflow and groundwater salinity changes, a saltwater intrusion monitoring network was initiated in the early 1990s for the entire coastal region of the District. To date, this network includes numerous springs and over 300 monitor wells completed into the Intermediate and Upper Floridan aquifers (UFA). During the 2013 minimum flow and level development process for both the Chassahowitzka and Homosassa Spring groups, information on chloride trends from several springs and over 30 monitor wells were presented in a series of public workshops held prior to establishment of the minimum flow and levels. Results of the water quality assessment completed in 2011 indicated that while some localized increases in chloride concentration had occurred in the UFA based on monitor well data within the nature coast springs region, most monitor wells showed little to no increasing trend since the early-1990s. Tidally-influenced springs such as Chassahowitzka Main Spring and Homosassa No. 1 Spring showed higher chloride concentrations during drier than normal climatic periods and lower chloride concentration during wetter periods. Weeki Wachee main spring chloride

concentration had increased slightly from around 6 mg/l in the early-1990s to near 9 mg/l by 2008.

Salinity Assessment

To support the current minimum flow reevaluation phase for both spring groups, the chloride concentration history for the springs and monitor wells assessed in 2011 were updated through 2018 (see Powerpoint slides 1-32 in attached PDF). The interpretation of these more recent results is similar to the previous assessment, in that while there are localized salinity increases, most monitor wells show little to no increasing chloride trends. Three monitor wells (two located near the Kings Bay spring group and one located near the Homosassa spring group) showed significant increasing chloride trends within the UFA, as was noted for the 2011 assessment. The wells included the Crystal River Deep well and Romp TR21-3 (Slides 26 and 27) and the Homosassa No. 3 well near Homosassa Spring group (Slide 19). Review of the 2015 groundwater pumping magnitude and distribution indicated no significant groundwater withdrawn in the vicinity of these three monitor wells (slides 33-35). One notable change from the previous assessment is that the slight increasing chloride trend at Weeki Wachee Spring and the Chassahowitzka No.1 well have stabilized over the last decade or so with concentrations near 9 mg/l, remaining largely unchanged, (slides 36 and 37).

Rainfall changes in the nature coast springs region can play a major role in varying salinity concentrations in this high recharge, largely unconfined setting of the UFA. Variations in recharge from even small changes in rainfall are on a much greater scale than groundwater withdrawals in the water budget. Extended drought conditions can lead to increasing chloride concentrations and wetter conditions decreasing concentrations.

Measurements of specific conductance, which can be a used as a surrogate for salinity, reached their peak at USGS monitoring stations on the Chassahowitzka and Homosassa Rivers from 2006 through 2009, and then rose slightly again from 2015 through 2017. Lower conductance values occurred outside of these periods with values in 2018 similar to those measured during the beginning of the period-of-record in 2004-2005 (slides 38-41). Superimposing radar-estimated rainfall for the Chassahowitzka Springshed with specific conductance history at the Chassahowitzka River near Homosassa gage station (No. 2310650) illustrates higher conductance values during drier than average years in 2006-09, 2016, and 2017. Lower conductance values occur during wetter years from 2004-05, 2012, 2014, and 2018 (Slide 42). A pattern similar to the Chassahowitzka River near Homosassa gaging station is apparent at the USGS Homosassa near Homosassa River gage (No. 2310700) (Slide 43). Overall, while conductance increases and decreases in response to climatic variation, there is no consistent long-term increasing trend in conductance over the last 15 years or so in the Chassahowitzka and Homosassa rivers based on 6^{th}-order polynomial fits to the daily data.

Impact of Groundwater Withdrawals on UFA Salinity Changes

In 2008, the District created the Northern District Groundwater Flow model (NDM). In addition to simulating flows and heads within the groundwater system, a separate sub-regional solute transport model was developed to examine potential changes in the saltwater interface position due to current and projected 2025 groundwater withdrawals (Hydrogeologic, Inc., 2008). Results of that modeling along the nature coast showed little to no movement of the saltwater interface due to withdrawals out to 2050 (slides 44-48).

Thickness of Freshwater Lens
The Ghyben-Herzberg (GH) Relation assumes for every unit of groundwater head above sea level there are 40 units of fresh water below sea level (Solinst, 2019). This analysis assumes hydrostatic conditions in a homogeneous, unconfined coastal aquifer.

An examination of the GH approximation and average head at District monitor wells in the freshwater portion of the aquifer indicates that at seven out of eight coastal sites, the top of the saltwater interface (1,000 mg/l) chloride concentration is significantly deeper than the GH estimation (slide 49). The interface depth was based on chloride concentration from packer tests and drill stem samples collected during exploratory drilling at each site. This information indicates that the freshwater lens is significantly thicker than other estimates based on the GH approximation in the nature coast springs region of the District. Average freshwater lens thickness from eight coastal sites was 365 feet based on measured depth to the saltwater interface versus 214 feet calculated from the GH approximation.

Summary
While there are a few localized increases in chloride concentrations from monitor wells within the UFA along the nature coast, evidence of significant large-scale changes in groundwater salinity within the UFA is absent. Most monitor wells show little to no change in chloride concentrations over the last 25 to 30 years. At major springs, the slight increase in chloride concentration since the early-1990s to about 2008 has flattened (i.e., stabilized) at Weeki Wachee main spring over the last decade. At Homosassa 1 and Chassahowitzka main springs, chloride values increase during drier rainfall years and decrease during wetter rainfall years (like river conductance) in an oscillating pattern that has resulted in a rather flat long-term trend since the early-1990s. Although the measurement period is shorter compared to wells and springs, review of conductance at sites in the Chassahowitzka and Homosassa rivers has shown no long-term upward trend during the last 15 years or so, with values heavily influenced by year to year rainfall variation. Conductance values in the very wet year of 2018 were similar to those measured in the beginning period of record, during the wet years of 2004-2005. Solute transport modeling and measurements of saltwater interface depth compared to GH approximations are indicative of a minimal threat of increasing regional salinity associated with groundwater withdrawals.

Responses to hydrodynamic model responses salinity-flow relationships are addressed below. Water clarity issues area also addressed below.

Final Response

The Panel stated they do not “fully agree” with the statement that “there is no evidence that a flow reduction will cause an increase of salinity” which appeared in a draft appendix. That appendix has been revised to eliminate that statement and includes the following: “Based on the above analyses, no definitive conclusions can be drawn about the effect of reduced SGD on salinity in SGD. To answer the question if a reduced SGD will cause SGD salinity to increase, future studies are needed, including more data collections and analyses and development of a subterranean estuary model which is capable of simulating interactions between groundwater movement and coastal water hydrodynamics and salinity transport processes in coastal groundwater flow.”

The Panel concludes that “this is an important area of uncertainty in the present MFL analyses and future work should focus on providing more data to make a final determination on the potential for salinity increases in the SGDs.” District staff agree, and the concluding statements in the appendix quoted above are consistent with the conclusions of the Panel.

Hydrodynamic modeling

Summary of Final Panel Comments

The Panel determined that the District addressed nearly all of the recommendations with the exception of a technical evaluation of the difference in salinity habitat results between the previous EFDC model and the new LAMFE model. The Panel notes that “a cursory review of the EFDC model identified concerns with its grid construction.” (p. 2-8)

Initial Response

Extensive changes have been made to the hydrodynamic modeling report included as an appendix. Additional references relating to the LAMFE model have been added to the modeling report. In the revised modeling report, more discussion about data analysis has also been included, a map showing bathymetry was added, LiDAR data were mentioned, and upstream boundary conditions of salinity and temperature are further discussed and described .

The map showing LAMFE cross sections now includes locations where inflows enter the simulation domain. RMSE and normalized RMSE values for the model results are included and discussed in the revised modeling report. A new appendix describes salinity-flow trends.

Final Response

A full description of the previous EFDC model is provided in the 2012 MFL report by Leeper et al. and its appendices. This model application was inadequate to confidently predict changes to low salinity habitats. As a result of the technical concerns with the previous EFDC modeling application, salinity-based habitats of 2 psu or less were not used to develop minimum flows in the initial minimum flows evaluation (Leeper et al. 2012). Differences between the currently applied LAMFE model and the previous EFDC model are summarized in Chapter 1 of the Final MFL Report and are available in more detail in their respective technical reports included as appendices to the 2012 and 2019 MFLs reports.

Water Quality Analysis

Summary of Final Panel Comments

The primary comments surrounding the water quality analyses related to how the NNC were discussed and characterized in the MFL report and the water quality report. The Panel notes that “future issues may arise where the approach and language in the water quality appendices do not match the updated approach and discussions in the MFL document.” (p. 2-9)

Initial Response

The threshold chlorophyll concentration described in the minimum flows report, is no longer identified as a Numeric Nutrient Criterion when used outside of its appropriate spatial area (i.e. WBID), temporal range, and statistical method associated with its implementation. Nonetheless, this value can be used outside of its scope as a NNC as a threshold concentration for consideration of potential water quality changes associated with implementation of the proposed minimum flow. The water quality assessment in the minimum flows report has been revised to reflect a post-hoc assessment in which the effects of setting the minimum flow at an allowable 8% reduction in the natural flow (i.e., the flow that would be expected in the absence of withdrawals) are explored based on exceedance of the threshold chlorophyll concentration. In addition, a new section on relationships between water clarity, chlorophyll, turbidity, and color was added to the report.

Final Response

In response to Panel comments, staff provided front matter added to the water quality appendix clarifying the distinction between numeric nutrient criteria and concentrations of chlorophyll used for other purposes. District staff note that the water quality appendix is a completed work product provided by a consultant, and that clarifying language is provided in the Final MFL report and front matter to the appendix.

Biological Communities Assessment

Summary of Final Panel Comments

“The Panel has determined that the District has adequately responded to the comments/recommendations made.” (p. 2-10)

Initial Response

Thank you for your comments. We not that there are no major issues identified with this aspect of our minimum flow analyses. All issues identified are addressed in the enumerated comments and responses below.

Final Response

No response required.

RESPONSES TO PANEL COMMENTS IN TABLE 2

Initial Responses to Individual Comments

1) All section headings added to Table of Contents.

2) All acronyms and abbreviations are defined upon their first use in text. Some past minimum flow reports have included lists of acronyms and abbreviations, others have not. This is a style choice.

3) As a general rule, appendices include District-funded work products developed for the minimum flows evaluation. Anderson and Stewart (2016) is a peer review of the NDM5, and was not created for this minimum flows evaluation. It is cited and available upon request.

4) Thank you for your comment.

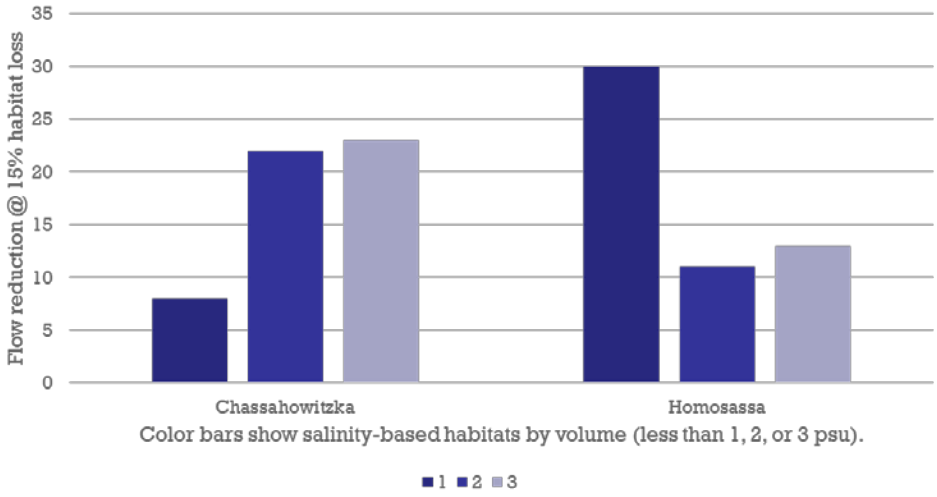
5) Mention of NDM5 added.

6) Sentence revised.

7) See updated language in section 1.4.1. Also, please provide clear, specific suggestions for work that could be done and what expected outcome of that work might be.

8) See response no. 7 above

9) Text in section 1.4.1 has been updated. The application of the 15% standard does consider unique characteristics of this system. See figure below for illustration of how application of this standard results in different percent-of-flow recommendations for the Chassahowitzka and Homosassa River systems and addresses how salinity-based habitats respond differently in the two systems.



10) Wording has been modified. With the similar grid resolution, the LAMFE model fits the river bathymetry better than the EFDC model does for the Homosassa River, which is narrow and meandering. Because of the narrowness, cross-sectional variations are much smaller than those in the longitudinal and vertical directions in the Homosassa River and a laterally averaged hydrodynamic model such as the LAMFE model is suitable for the riverine estuary. The LAMFE uses a semi-implicit scheme named the free-surface correction method, which is very efficient and allows the Courant number generally to be larger than 15, making model runs for a long simulation period (e.g. >10 years) relatively easy.

11) In response to the Panel's question "*Why is an average flow alone sufficient to protect from significant harm?"* we note that typically, the percent-of-flow approach for lotic systems is superimposed on seasons referred to as "Blocks" to reflect changes in system sensitivity to flows. However, in springflow and tidally-dominated water bodies, such as the Homosassa River System, seasonal flow patterns are dampened relative to those in runoff-driven, non-coastal systems. A single minimum or allowable percentage reduction of flow is therefore considered appropriate and reasonable for water management purposes. Furthermore, we note that from an assessment perspective, the effects of groundwater withdrawals are diffuse in space and time, making seasonal or previous-day, flow-based withdrawal limits impractical for groundwater flow dominated systems. Finally, we note that there is no evidence in any of the available data that significant harm to the river system due to withdrawals may be expected at times of lower flows.

12) Text regarding the 15% standard in section 1.4.1 has been updated. See specific, numbered comments above and our response in general comments section.

13) Text regarding 15% standard in section 1.4.1 has been updated. See comments above and our response in the general comments section.

14) Text regarding 15% standard in section 1.4.1 has been updated. See previous comments and responses.

15) This figure will be updated in future drafts.

16) The purpose of section 2.3 is to provide simple results of gage data over time. Use of gage data and other data sources for hydrodynamic modeling purposes is discussed in the hydrodynamic modeling appendix. The time series for hydrodynamic modeling and water quality analysis are not the same because the period of record for water quality data and hydrodynamic modeling simulation runs are not the same.

17) Caption of Table 2-2 has been changed. The purpose of section 2.3 is to briefly summarize the available gage data and general temporal trends. Specific modeling applications of the data are addressed in the hydrodynamic modeling appendix. Note text of 2.3 states "15-minute data are often reported, as are field measurements and data averaged over monthly and yearly time periods". The interested user can access and use USGS data as they see fit.

18) The purpose of section 2.3 is to briefly summarize available, relevant gage data and general temporal trends. Specific modeling applications of the data are addressed in the hydrodynamic modeling appendix.

19) There is no comment no. 19.

20) The purpose of figure 2-16 is to show, as stated in the text of 2.3.1, that field measurements of flow at Homosassa Springs at Homosassa Springs, FL (Gage No. 02310678) date back to 1930, and are very sparse before the mid-1960s, when measurements became more common, and to note that it was not until 1996 that a large number of samples were collected and used to develop regressions for reporting flow (Knochenmus and Yobbi 2001, Figure 2-16). The reviewer is correct to point out that when and how the measurements were taken will affect their practical

use for determining flow, which is why their measurements are not included here. Again, the point is to show that historical measurements were infrequent prior to District initiation and funding of the gage at this site. We add that historical field measurements were summarized in the District's 2012 report that supported development of the currently adopted minimum flows for the river system.

21) Figures 2-17 and 2-18 updated.

22) Figure 2-24 updated.

23) Figure 2-25 updated.

24) Figure 2-30 updated.

25) Figure 2-34 updated.

26) Figure 2-38 updated.

27) Figure 2-42 updated.

28) A note about psu added to section 2.3. in the added text we indicate that salinity is dimensionless, and use of "psu" as a unit is not universally considered as necessary. The journal *Estuaries and Coasts*, for example, allows authors to report salinity as a dimensionless value, e.g. "at a salinity of 35."

29) Units added to caption.

30) "psu" added to the y axis.

31) "psu" added.

32) Correction was made.

33) Units were added.

34) Units were added to caption. Note salinity is a dimensionless quantity.

35) "psu" added although salinity is a dimensionless quantity.

36) "cfs" added.

37) "psu" added to caption. Note salinity is a dimensionless quantity.

38) "psu" added although salinity is a dimensionless quantity.

39) "psu" added.

40) "cfs" added.

41) A note about psu was added to section 2.3.

42) "cfs" added.

43) See note concerning salinity expression that was added to section 2.3.

44) Salinity is dimensionless.

45) See response no. 28 above.

46) Text of section 2.3 was modified

47) Text added to section 3.1.2 regarding TMDLs.

48) We note that nitrate levels are discussed in later sections.

49) Additional descriptive text was added to the caption.

50) The gradient in UF data is described in text.

51) The discussion in section 3.4.3 concerning potential nutrient limitation references Frazer (2002) in which the authors analyzed potential nutrient limitation throughout the region. No additional analyses were performed to further substantiate the conclusions of Frazer (2002)..

52) Text was added to section 3.4.5.

53) For water quality analyses, a flow record was created based on methods used for the minimum flows established in 2012, and linked to gaged flows at the Homosassa Springs and SE Fork gages (see section 3.5.1). Hydrodynamic modeling used a separate, independently derived flow record for SGD, in part because the period of record was different, with the LAMFE having a shorter, more recent period (water quality record extended to 1993, the LAMFE record extended to 2007) and partly because LAMFE includes inputs at additional tributaries. Hydrodynamic modeling also requires a finer time scale than the water quality analyses. Water quality data is collected at most once per day, and thus is compared with daily flows, while LAMFE input data is in 15 minute intervals. Both flow records used USGS gaged flows and NDM5-predicted withdrawal impacts, but applied them according to their unique needs. The SGD used for hydrodynamic modeling discussed in appendix X.

54) SGD – salinity relationships are discussed in a new appendix to the report.

55) Comment noted; the reviewer states: “Technical analyses are sound. Issues raised below (to comment #61) in other comments address concerns around the use of the NNC standard, not the technical analyses.”

56) The 7.7 µg/L value as used here is not the NNC. This value has been used for a separate analysis which cannot be interpreted in terms of NNC impairment. See updated discussion in section 3.5.3.

57) See response no. 56.

58) See response no.56.

59) See response no.56.

60) See response no.56.

61) Reviewer states: “Exceedance of criteria is not a habitat, therefore, the use of the 15% harm criteria seems to extend its use too far.” We agree. Note this is a separate issue from that raised in comment No. 56. This value can be used as a threshold for the type of analysis described in section 3.5.3. where increased risk of exceedance is

related to decreased flow. However, it is not clear that 15% increased risk of a water sample being above this value is consistent with “significant harm”, and this is not analogous to 15% loss of a habitat, which is much more clearly harmful. Section 3.5.3 has been edited for clarity on this point.

62) A new appendix discusses salinity-flow trends, and new section 3.1.5 addressed water clarity.

63) Text in 3.5.2 clarified with respect to “harmful constituents”.

64) Water clarity discussed in new section 3.1.5.

65) A new appendix discusses salinity-flow trends and new section 3.1.5 addresses water clarity.

66) Discussion of nutrient loading and residence time added to section 3.5.2.

67) Thank you for your comment.

68) Discussion of water clarity added in new section 3.1.5.

69) No comment provided.

70) Thank you for your comment.

71) Subheading removed.

72) Thank you for your comment.

73) Thank you for your comment.

74) Thank you for your comment.

75) There is no evidence of excess habitat for Common Snook comparable to that for manatee.

76) Thank you for your comment.

77) Text added to future drafts.

78) As a general rule, appendices include District-funded work products developed for the minimum flows evaluation. Anderson and Stewart (2016) is a peer review of the NDM5, and was not created for this minimum flows evaluation. It is cited and available upon request.

79) All LAMFE-related papers and reports are referenced. These references provide documentation about testing and validation of the LAMFE code. Reprints of all cited papers can be provided upon request. Presentation of boundary conditions in modeling report will be amended.

80) More descriptions about these upstream boundary conditions are included in the revised modeling report.

81) Flow-salinity relationships are described in anew appendix. A sensitivity analysis was performed to examine how sensitive the 34-month average salinities and

temperatures at the five USGS stations to water level and salinity estimates in Salt River and Mason Creek. It was found that a 1% of boundary condition change in Salt River and Mason Creek causes < 0.01% salinity and temperature changes at most stations. It is therefore concluded that simulated salinity and temperature in the entire river are expected to not be sensitive to the boundary conditions in Salt River and Mason Creek.

82) A new appendix addresses flow-salinity trends.

83) 1. The selection of LAMFE is mainly based on the following considerations:

a) A District staff member is created the model and is therefore highly knowledgeable about model details;

b) A laterally averaged hydrodynamic model is suitable for a narrow and meandering river, because the cross-sectional variations of simulated variables are much smaller than those in the vertical and longitudinal directions; and

c) With a similar grid resolution, LAMFE fit the river bathymetry much better than a 3D model.

2. Methods used to estimate salinity and flow boundary conditions for the tributary springs are described in the hydrodynamic modeling report.

3. As mentioned in the hydrodynamic modeling report, sea level rise simulations only considered the SLR; effects caused by SLR on other variables were not considered.

4. Error and accuracy of input data are unknown and uncertain.

5. It is not clear what the reviewer has asked for in terms of sensitivity analysis. It would be helpful if response variables (he only named a few independent variables such as the downstream, upstream, and lateral salinity BCs) were identified, and a reason for the sensitivity analysis was provided

In the revised modeling report, it is mentioned that a series of model runs indicates that the most sensitive model parameter to simulated water levels in the upstream portion of the Homosassa River is the bottom roughness, while the most sensitive model parameter to simulated salinities is the ambient eddy viscosity/diffusivity. For temperature simulation, the most sensitive model parameter is the light attenuation coefficient.

As long as the sensitivities of salinity and thermal habitats to the SGD reduction are concerned, the entire scenario simulation section in the hydrodynamic modeling report is about this issue.

6. Again, the reviewer didn't name response variables for uncertainty analysis. Also, because uncertainties of input data are not quantified, no uncertainty analysis can be done.

84) Flow and salinity inputs are further described in the hydrodynamic model report.

85) Model parameters may be tuned. This word is commonly used for this purpose in modeling literature. According to Merriam-Webster, tune: 2b: to adjust for precise functioning, 2c: to make more precise, intense, or effective.

86) Text edited for clarity.

87) Presentation of SGD data updated in the hydrodynamic modeling appendix.

88) Time periods are presented in Table 6-1 on the preceding page of the report.

89) See discussion of uncertainty above in comment 83 and elsewhere.

90) See response to 75 above.

91) This comment is addressed in the updated hydrodynamic modeling report

92) The updated water quality discussion in section 7.2.9 addresses these concerns.

93) See response to comment no. 92.

94) See response to comment no. 92.

95) Correction made.

96) The proposed minimum flow for the Homosassa River System, which are based on LAMFE simulations, allows up to a 5% reduction in the natural flow.. Calculation of uncertainty associated with th proposed minimum flow would require many model runs, as we have a number of (N) response variables and many (M) independent variables (various input data, model parameters, model assumptions, etc.) This type of analysis is typically very time-consuming and could take months or even years to complete, depending upon the approach used for the analyses. B A Monte Carlo approach or the First Order Second Moment (FOSM) approach could require hundreds or thousands of model runs and extensive post-processing of model results (please note that each set of independent variables equals to 13 model runs: one for baseline flow and 12 for 12 flow reduction scenarios. As such, even the FOSM were chosen, it would take NxMx26 runs.)

However, all these model runs are impossible if uncertainties for each input data and model parameters are unknown. While some model parameters have known uncertainties, uncertainties for most input data are unknown.

Also, if using a Monte Carlo approach, probability functions of the uncertainty of each independent variable should be known.

97) The phrase “are stable” was removed.

98) Because the verification statistics are considered “good”, the hydrodynamic model is good at predicting outcomes of flow reductions on temperature, salinity, and water levels. We can therefore be confident the model is “correct”, based on these verification statistics.

99) See discussion of uncertainty above in response to comment no. 96

100) See discussion of 15% standard above in the response to general comments section. The application of the 15% standard to the system's salinity-based and temperature-based habitats is responsive to the unique sensitivity of this system to flow reductions. See figure included above in response to comment no. 9.

101) See above response general comments (no. 4) on saltwater in springs.

102) The mention of "stability" has been clarified. Our intention was to state that the referenced biological aspects of the system were stable with respect to flow variation, and current best available information did not indicate existing withdrawal impacts would be significantly harmful to these aspects of the system. The Panelist is correct in noting that many aspects of the system are in flux and quite variable.

103) Clarification added.

104) More analyses have been added to the hydrodynamic modeling report.

105) A discussion of depth data has been added to the hydrodynamic modeling report.

106) A sensitivity analysis for Salt River and Mason Creek boundary conditions has been added to the end of section 3 in the hydrodynamic modeling report

107) In all the time series plots, dates are now used for the x-axes.

108) Locations where SGDs flowing to the simulation domain are now shown in Fig 14 of the hydrodynamic modeling report

109) These upstream boundary conditions are not exactly the same as those measured at the stations. By this we mean that they are not used as input data at the same locations as the data stations. Water levels were not used. Salinities and temperature in SGD were estimated based on these upstream stations using an iterative trial-and-error approach but are not necessarily the same as measured salinities and temperatures at these stations. As such, upstream these stations can still be used as calibration stations.

More descriptions of the upstream boundary conditions were added to the hydrodynamic modeling report.

NOTE: NUMBERING FROM THIS POINT FORWARD WAS IN ERROR IN PEER REVIEW DOCUMENT. FIRST NUMBER IS CORRECT NUMBER OF ITEM, SECOND NUMBER IS THAT GIVEN IN PEER REVIEW DOCUMENT.

110) (107) RMSEs are now included in the hydrodynamic modeling report.

111) (108) Reviewer comment says: "See earlier comments". Please see earlier responses.

112) (109) This appendix is a completed final product from a consultant. Updated residence time discussion has been included in section 3.5.3 of the minimum flows report.

113) (110) See updated Table 3-1 and Figure 3-1 in section 3.1.2 showing applicable NNC, TMDLs and WBIDs.

114) (111) Discussion of chlorophyll analysis with respect to NNC is updated in section 3.5.3.

115) (112) See updated treatment of this information in the revised minimum flows report, where the analyses are described a as a post-hoc assessment of the proposed minimum flows.

116) (113) Discussion of chlorophyll analysis with respect to NNC is updated in section 3.5.3. Chlorophyll analysis is now explained as a post-hoc check in section 7.1.

117) (114) See discussion of flow record in section X.X of the minimum flows report.

118) (115) This appendix is a completed final product from a consultant, and staff does not anticipate its revision, except for correction of any major errors that could materially affect the proposed minimum flows.

119) (116) See discussion of nitrate and nitrite in sections 3.3.2 and 3.4.2 in chapter 3 of minimum flows report.

120) (117) See updated discussion in section 7.1

121) (118) See updated discussion in Chapter 3.5.3

122) (119) See updated discussion in Chapter 3.5.3

Final Response

The Peer Review Panel added a column to their Table 2 indicating that comments have been resolved or no action is required. All but two were resolved. The first exception (item 14) references the general issue noted above regarding determination of significant harm using a 15% change standard, which the Panel determined did not apply to this minimum flows evaluation, but recommended further research into the evaluation of significant harm outside of any specific minimum flows determination.

The second exception stems from a Panel requested (item 18) discussion of importance of mixed diurnal and semi-diurnal tides as well as longer term astronomical tidal cycles and the wind driven impacts and notes that this discussion was not provided. Following the final peer review report, text has been added to section 2.3.1 discussing mixed diurnal and semi-diurnal nature of tides, longer term astronomical tides, and wind impacts on tide.

We note that the Panel concluded that “no unresolved recommendations remain.”

Note Initial Peer Report had comment numbering errors including skipping number 19 and repeating 107 in place of 110. Final Peer Report numbers comments correctly 1 to 121.

RESPONSES TO REVIEWERS SPECIFIC COMMENTS IN TABLE INCLUDED IN SECTION 3 OF THE INITIAL PEER REVIEW REPORT

Initial Response

1) Thank you for your comments. See responses above concerning: 15 percent-of-change habitat-based or resource-based standard, water quality analyses, uncertainty analyses, and temperature-based habitats.

2) Thank you for your comments. See responses above concerning: SGD inputs, water clarity, SAV monitoring, and salinity trends.

3) Thank you for your comments. See responses above concerning: SGD inputs, NNC and chlorophyll analyses, and the 15 percent-of-change habitat-based or resource-based standard.

4) Thank you for your comments. See responses above concerning: sensitivity analyses and SGD inputs in update hydrodynamic modeling appendix, uncertainty analyses, salinity trends, and water clarity.

5) Thank you for your comments. See responses above concerning: salinity trends and sensitivity analyses and SGD inputs in update hydrodynamic modeling appendix.

6) Thank you for your comments. See responses above concerning: salinity trends and sensitivity analyses and SGD inputs in update hydrodynamic modeling appendix and uncertainty analyses.

Final Response

The Panel determined that:

- The conclusions were supported by analyses presented
- The data used were properly collected, quality assurance was performed, no data were excluded, and data were the best information available.
- Technical assumptions were clearly stated, assumptions were eliminated to the extent possible, and no analyses were identified that would require fewer assumptions.
- The procedures and analyses were appropriate, reasonable, and based on the best information available. Procedures and analyses incorporated all necessary factors; were correctly applied and repeatable; limitations and imprecisions were reasonably handled; and conclusions based on procedures and analyses are supported by the data.
- No deficiencies or remedies are identified.
- No alternative methods have been identified by the Panel in the Final Peer Review Report.

In summary, there are no outstanding issues or problems with the MFLs reports, appendices, or other documentation reviewed by the Peer Review Panel.

Independent Scientific Peer Review of Minimum Flows Proposed for the Chassahowitzka and Homosassa River/Spring Systems in Citrus and Hernando Counties

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Administrator

8 posts

TomHughes

1545845447

Independent Scientific Peer Review of Minimum Flows Proposed for the Chassahowitzka and Homosassa River/Spring Systems in Citrus and Hernando Counties

Minimum flows and levels are limits established by the District Governing Board for surface waters and groundwater that are intended to prevent significant harm to the water resources or ecology of an area that may be caused by water withdrawals. Minimum flows were established for the Chassahowitzka and Homosassa river/spring systems in Citrus and Hernando counties in 2013. Proposed minimum flows based on reevaluation of these established minimum flows are summarized in two separate revised final draft reports and appendices available on the District's Minimum Flows and Levels Documents and Reports

page.

The District will voluntarily subject all scientific or technical data, methodologies, models, and scientific and technical assumptions used to support development of the proposed minimum flows to independent scientific peer review. A panel of three independent, recognized experts in the fields of hydrology, hydrogeology, limnology, biology and other scientific disciplines will review the proposed minimum flows and prepare a final peer-review report for the District Governing Board. The Board will give significant weight to the panel's report when establishing reevaluated minimum flows for the Chassahowitzka and Homosassa river systems.

Peer Review Panel Meetings

Meetings conducted by the peer review panel will occur in February, March and May 2019. They will include an initial, in-person meeting, with a field trip to both river systems, as well as web-based teleconferences facilitated from the District's Brooksville office. The meetings will include opportunities for public comment on the review process.

QUOTE 0 0

LAMFE Model Review Question

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1549901137

Attached email string (**Email to DYobbi-Thanks Homo MFL WQ App issue.pdf**) between Doug Leeper (Southwest Florida Water Management District) and Dann Yobbi (Chassahowitzka_Homosassa Peer Review Panelist) addresses review of the hydrodynamic model used to support the District's minimum flow reevaluations for the Chassahowitzka and Homosassa River systems. The email identifies several documents, including those associated with peer review, that address the District's use of the LAMFE model for minimum flow projects. Also attached is a minimum flow peer review report (**Powell et al. 2008 - Lower Alafia Peer Review.pdf**) for the lower Alafia River that includes some particularly useful review information for the LAMFE model.

Email to DYobbi-Thanks Homo MFL WQ App issue...
8.84 MB

Powell et al. 2008 - Lower Alafia Peer Review.pdf
285.52 KB

QUOTE 0 0

Cited nitrate-flow report requested by Dann Yobbi, Peer Review Panelist

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

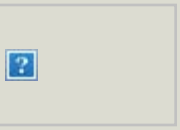
Moderator
67 posts

Doug Leeper
1549902290

Report (**Upchurch et al. 2008 - Relationships of nitrate to flow in springs in SRWMD.pdf**) on nitrate-flow relationships that is cited in the appendices to the draft Chassahowitzka and Homosassa minimum flow reports, and was requested by and provided to Dann Yobbi, Peer Review Panelist.

Upchurch et al. 2008 - Relationships of nitrate to f...
3.02 MB

QUOTE 0 0



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka Hydrodynamic Modeling Report Replaced with Current Version

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1549913525

Panelists: An old version of the Chassahowitzka hydrodynamic model appendix was inadvertently posted to the MFLs Documents & Reports web page. The updated (Jan 2019) version (it is Appendix 7 to the draft Chassahowitzka report) was posted to the web page earlier this afternoon.

QUOTE 0 0

Questions on existing Chassahowitzka minimum flow by Dann Yobbi

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1550062159

Questions from Dann Yobbi in a 2019-01-24 email to Doug Leeper:
A couple of questions concerning the Chass MFL:
1. Where can I find info on the boards decision to adopt 3% instead of the staff's recommendation of 9% for the 2012 MFL?
2. What is the justification for including Blind Springs in the Chassahowitzka River's MFL? Doesn't make sense to me.

Responses to Dann Yobbi in a 2019-01-25 email from Doug Leeper:
1. Information concerning the District Governing Board's decisions concerning establishment of minimum flows for the Chassahowitzka River system (and the Homosassa River System) is provided in the attached recap and excerpt from the minutes for the October 2012 Governing Board meeting. Additional information concerning the Governing Board's decision is available in the video recording of the meeting.
Attachments: SWFWMD 2012-10 Gov Bd Recap Chass-Homo

MFLs.pdf, SWFWMD 2012-10 Gov Bd Minutes Chass-Homo MFLs.pdf.

2. The section of the Florida Statutes addressing prioritization of water bodies for minimum flows and minimum water levels was revised several years ago to require that “[e]ach water management district’s priority list and schedule shall include all first magnitude springs, and all second magnitude springs within state or federally owned lands purchased for conservation purposes.” Based on this requirement and available information, Blind Springs was included in the original minimum flow analyses and currently established rule for the Chassahowitzka River System. For the same reasons it was also included in the analyses supporting the current minimum flow reevaluation.

SWFWMD 2012-10 Gov Bd Recap Chass-Homo MF...
53.30 KB

SWFWMD 2012-10 Gov Bd Minutes Chass-Homo ...
23.26 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa Minimum Flows Peer Review Meeting/Field Trip - Feb 8, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1549899597

Meeting agenda (**Agenda-Chass_Homo Peer Rev Mtg_Field Trip 2019-02-08_V4.pdf**) and presentation slide files (**Chass_Homo Peer Rev Mtg Slides 2019-02-08.pdf** and **Peer Review Sunshine Law Briefing 2019_02-07.pdf**) used by District staff during the meeting are attached.

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1549899946

Two documents provided to the peer review panel by Mr. Brad Rimbey during the field trip portion of the Feb 8, 2019 panel meeting/field trip are attached. Filenames: **Chass Main 1970 to 2012.jpg** and **Chaz MFL Springs - Flow Records.pdf**.

Chaz MFL Springs - Flow Records.pdf
2.37 MB

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1550093928

Meeting summary for the Chassahowitzka-Homosassa Minimum Flows Peer Review Meeting/Field Trip - Feb 8, 2018 that was prepared by Doug Leeper and Steve Peene is attached. File: **Chass_Homo MFLs Peer Rev Mtg Summ 2019-02-08_With Slides.pdf**.

Chass_Homo MFLs Peer Rev Mtg Summ 2019-02-...
2.11 MB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Dann Yobbi's Preliminary Comments

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1550243207

Attached is my preliminary review comments for the Chassahowitzka and Homosassa River Systems MFLs.

YobbiPreliminaryComments.docx
115.49 KB

QUOTE 0 0

Participating Member

49 posts

Steven Peene
1550326581

Thanks Dan. We'll discuss on Monday. I am looking to post my initial comments by Sunday evening.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Steve Peene Initial Comments/Questions

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

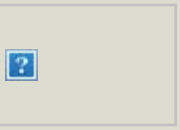
Participating Member
49 posts

Steven Peene
1550455401

Attached are my initial comments/questions for discussion at the first panel meeting.

Peene Initial Comments (02-17-19).docx
30.17 KB

QUOTE 0 0



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Revised Comments

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

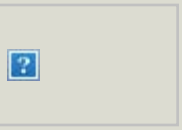
Participating Member
49 posts

Steven Peene
1550497521

I realized in my post from last night that I did not include some of my comments/questions for the water quality aspects. A revised document is provided.

Peene Initial Comments (02-18-19).docx
30.49 KB

QUOTE 0 0



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Revised Comments

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member

49 posts

Steven Peene

1550497521

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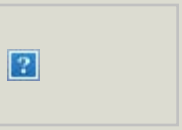
Peene Initial Comments (02-18-19).docx
30.49 KB

QUOTE 0 0



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

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Chass LAMFE Model

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
2 posts

xchen
1550520805

Here is the Chass LAMFE model

Chass_Lamfe.zip
30.02 MB

QUOTE 0 0

Registered Member
2 posts

xchen
1550520907

Here is the Homo LAMFE model

Homo_Lamfe.zip
59.98 MB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Example-Hydrodynamic Model Sensitivity Analysis

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1550579474

An example of a hydrodynamic model sensitivity analysis (**ManateeRiver_ECSS_Paper_2012.pdf**) posted in response to a request from Dann Yobbi, peer review panelist.

ManateeRiver_ECSS_Paper_2012.pdf
2.36 MB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

General Comments

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1551096435

Attached are my preliminary general comments on the Chassahowitzka and Homosassa MFL reports.

YobbiChass-GeneralComments.docx
24.06 KB

Yobbi-Homo-GeneralComment.docx
23.98 KB

QUOTE 0 0

Participating Member

49 posts

Steven Peene
1551098634

Thanks Dann.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa Minimum Flows Peer Review Teleconference - Feb 18, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1550238045

Teleconference agenda (**Agenda-Chass_Homo Peer Rev Telecon 2019-02-18.pdf**) prepared by Steve Peene and Doug Leeper is attached.

Agenda-Chass_Homo Peer Rev Telecon 2019-02-1...
75.71 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1551189306

Attached are the summary meeting notes from the February 18 Panel Meeting prepared by Steve Peene and Doug Leeper.

Chass_Homo MFLs Peer Rev Telcon Summary 201...
293.93 KB

QUOTE 0 0

Draft Review Guideline Forms Chass/Homo MFL's

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1551229641

Attached are my draft review guideline forms for Chass/Homo MFL's. No difference between the two.

Yobbi-MFL Review Guidelines - Chassahowitzka (1...
19.36 KB

Yobbi-MFL Review Guidelines - Homosassa (1).docx
19.61 KB

QUOTE 0 0

Participating Member

49 posts

Steven Peene

1551279726

Thanks Dann.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

UPDATED CHASS REVIEW GUIDELINE FORM

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1551269562

Delete previous form. Made a few editorial corrections.

Yobbi-MFL Review Guidelines - Chassahowitzka (1...
19.38 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1551279757

Thanks Dann.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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Categories Topics Search Members Southwest Florida Water Management District

MFL Guidelines Form

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1551104187

Attached is a form for filling out the specific task questions we will be discussing today. This would be something to fill out over the next few days for incorporation into the draft report. Thanks.

MFL Review Guidelines.docx
21.80 KB

QUOTE 0 0

Participating

Member
49 posts

Steven Peene
1551129933

Attached are revised forms to be filled out for each of the reports. As we are doing two reports, it makes sense to provide for separate responses to each even if they are very similar or identical. If I missed anything on either of the forms or they need edits let me know. Thanks.

MFL Review Guidelines - Chassahowitzka.docx
22.24 KB

MFL Review Guidelines - Homosassa.docx
23.09 KB

QUOTE 0 0

Registered Member
14 posts

abmunson
1551196524

Here is an initial draft of my thoughts. I note that in the CR report we left the panelist comments separate. In other reports we have tried to craft a unified statement. Do you envision a consensus statement for each or will be make individual observations in the final report?

MFL Review Guidelines_ABM.docx
16.82 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1551279790

Thanks Adam.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Draft Homosassa Peer Review Report

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1551566052

Attached is the first draft of portions of the Homosassa Peer Review Report for review. The tabular specific comments are not included. Those will be provided following the Monday meeting. We will discuss the sections provided on Monday.

Draft_Homosassa_Peer_Review_Report_030219.d...
531.94 KB

QUOTE 0 0

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Categories Topics Search Members Southwest Florida Water Management District

Draft Chassahowitzka Peer Review Report

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member

49 posts

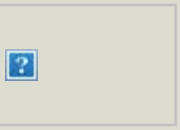
Steven Peene

1551699878

Attached is the first draft of portions of the Chassahowitzka Peer Review Report for review. The tabular specific comments are not included. Those will be provided following todays meeting. We will discuss the sections provided.

Draft_Chassahowitzka_Peer_Review_Report_0303...
562.96 KB

QUOTE 0 0



Chassahowtizka-Homosassa Minimum Flows Peer Review Teleconference - Feb 25, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1550772204

Teleconference agenda (**Agenda-Chass_Homo Peer Rev Telecon 2019-02-25.pdf)** prepared by Steve Peene and Doug Leeper is attached.

Agenda-Chass_Homo Peer Rev Telecon 2019-02-2...
75.95 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1551808152

Attached please find the summary from the 02-25-29 Meeting. Thank you.

Chass_Homo MFLs Peer Rev Telcon Summ 2019-0...
235.83 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Section Tables for Editing and Input

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1551991235

Dann and Adam,

Attached are our efforts to fill in the specific comment tables from the comments you provided. We have separated them so that you each have your own for each report. We have a lot of blanks in there as we have provided areas for all Appendices as well as the main reports. If there are no comments in the end for certain sections or appendices we will remove the blanks. Please fill in where appropriate the column on if the comment materially impacts the MFL and the part B with the recommended corrective action. Once we receive each of yours back we will merge them with mine. While the table only lists (Yes/No) as the answer on the material question, as we discussed the answer can be maybe. We will fix that on the table header in the final version. Thanks.

Homosassa Tables Munson Section 2.docx Homosassa Tables Yobbi Section 2.docx

49.75 KB

45.74 KB

Chassahowitzkas Tables Munson Section 2.docx
50.51 KB

Chassahowitzkas Tables Yobbi Section 2.docx
46.77 KB

QUOTE 0 0

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Categories Topics Search Members Southwest Florida Water Management District

15 Percent Harm Rewrite

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1551881227

Dann and Adam,

Attached is my shot at combining our comments on the 15% harm threshold. Please review and send me back any edits/comments/changes. Thanks.

Significant Harm Threshold of 15 Percent Habitat ...
13.47 KB

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1551896745

Nice write-up Steve. No edits from me.
Dann

QUOTE 0 0

Registered Member
14 posts

abmunson
1552307555

Sorry for the delay. My travel was extended when our plan lost and engine and we returned to AMS. Regardless, I thoroughly agree with the statement and think you did a great job.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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SECTION 2 TABLES

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1552156897

Steve--Attached are Section 2 tables for CR and HR initial peer review reports.

zChassahowitzkas Tables Yobbi Section 2 (1).docx
49.49 KB

zHomosassa Tables Yobbi Section 2 (1).docx
48.73 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552261802

Thanks Dann

QUOTE 0 0

Registered Member
14 posts

abmunson
1552311581

Here are my Section 2 tables.

Chassahowitzkas Tables Munson Section 2_ABM.d...
44.15 KB

Homosassa Tables Munson Section 2_ABM.docx
41.74 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552320111

Thanks Adam.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

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YOBBI REFERENCES

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

Dann Yobbi
1552312997

Steve--Attached is the listing of references I cited in my write-ups. Please let me know if any are missing.

Dann

Yobbi-ReferencesCited.docx
13.21 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552320141

Thanks Dann

QUOTE 0 0

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My Initial Notes and Comments for Discussion

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
14 posts

abmunson
1550500073

Here are my initial notes for discussion on 2-18-19

Initial comments Chassahowitzka & Homosassa A...
17.51 KB

QUOTE 0 0

Registered Member
14 posts

abmunson
1551111232

Note for 2-25-2018

Second Week comments by page and chapter Cha...
17.62 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1551114198

Thanks Adam

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1552330821

A 2019-02-15 email from Adam Munson to Doug Leeper associated with development of Adam's initial notes and comments that were posted for panel discussion on 2019-02-18.

Email from AMunson-Water diversion study.pdf
13.54 KB

QUOTE 0 0

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Categories Topics Search Members Southwest Florida Water Management District

Draft Executive Summaries

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1552472488

Attached are drafts of the Executive Summaries for review. Thanks.

Homosassa Executive Summary (03-12-19) DRAF...
35.73 KB

Chassahowitzka Executive Summary (03-12-19) D...
36.71 KB

QUOTE 0 0

Registered Member
14 posts

abmunson
1552502945

Thanks for the posting Steve. I am in general agreement and think you have done a great job summarizing the report.

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1552564718

Steve--Good job summarizing our separate reviews. Like Adam, I am in general agreement. Attached are the two ES with a couple of minor editorial changes for your consideration.

YobbiChassES (03-14-19) DRAFT (1).docx
24.60 KB

YobboHomoES (03-14-19) DRAFT (1).docx
24.43 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552824916

Thank you Dann and Adam

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa Minimum Flows Peer Review Telelconference - March 4, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1551459573

Teleconferene agenda (**Agenda-Chass_Homo Peer Rev Telecon 2019-03-04.pdf**) prepared by Steve Peene and Doug Leeper is attached.

Agenda-Chass_Homo Peer Rev Telecon 2019-03-0...
76.33 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552825245

Attached is the final Meeting Summary for the 3-4-19 Panel Meeting.

Chass_Homo MFLs Peer Rev Telcon Summ 2019-0...
229.80 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552833307 · Edited

I have removed the Draft watermark on the meeting summary and provided as a PDF.

Chass_Homo MFLs Peer Rev Telcon Summ 2019-0...
240.02 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa Minimum Flows Peer Review Teleconference - March 11, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1551966493

Teleconference agenda (Agenda-Chass_Homo Peer Rev Telecon 2019-03-11.pdf) prepared by Steve Peene and Doug Leeper is attached. NOTE THE 9 AM START TIME.

Agenda-Chass_Homo Peer Rev Telecon 2019-03-1...
76.25 KB

QUOTE 0 0

Registered Member
3 posts

Brad W. Rimbey
1552063393

Following is a piece I wrote for the upcoming Homosassa River Alliance newsletter. I'm on the HRA Board of Directors. I'd welcome any comments/criticisms. It was a pleasure meeting you all at SWFWMD's Chassahowitzka boat ramp. Brad Rimbey

Homosassa & Chassahowitzka MFLs Revisited

Brad W. Rimbey

Florida law (373.042) requires Southwest Florida Water Management District (SWFWMD) to set Minimum Flows and Levels (MFLs) for all water bodies within the District. MFLs are intended to prevent “significant harm” to ecosystems via human related (anthropogenic) water uses. SWFWMD has adopted a policy which defines “significant harm” as any anthropogenic flow or water level reduction which causes a 15% loss of the affected ecosystem. The unilateral application of 15% harm as “significant harm” has repeatedly been questioned by SWFWMD's peer review panels.

Both Homosassa and Chassahowitzka were designated as Outstanding Florida Waters in 1993. Additionally, both of these coastal rivers were designated as Outstanding Florida Springs in 2016. These designations were intended to protect these waters from permanent degradation via anthropogenic activities. SWFWMD's current proposed MFLs continue to ignore these protective designations as they have opined a 15% degradation of these supposedly protected waters as acceptable.

In 2013, SWFWMD's Governing Board (GB) adopted MFLs which would allow only a 3% natural flow reduction for the Homosassa and Chassahowitzka Rivers. The Homosassa MFL was set at 3% based on predicted salinity changes in the

Homosassa over 20 years. The Chassahowitzka MFL was based on maintaining a manatee thermal refuge at the eastern boundary of the Chassahowitzka National Wildlife Refuge. For Chassahowitzka, SWFWMD's GB rejected staff's MFL recommended 9% natural flow reduction and adopted a 3% flow reduction to match Homosassa's MFL. SWFWMD 's GB applied common sense over SWFWMD staff's “science based“ recommended MFLs.

In 2013, SWFWMD staff opined that approximately 1% of the natural flow had been taken from both the Homosassa and Chassahowitzka due to anthropogenic water extractions in these springs-sheds. SWFWMD's GB instructed staff to gather additional data to support their flow reduction recommendations within six years. Little has been done in that regard.

Six years have now passed and SWFWMD has released its draft peer review MFL reports. In the 2019 MFL peer review draft reports for Homosassa and Chassahowitzka, SWFWMD now opines that 1.9% of the natural flow has been taken from Homosassa and 1.4 % has been taken from Chassahowitzka. SWFWMD further predicts that only 3% of Homosassa's natural flow will be taken by 2035 and 2% will be taken from Chassahowitzka by 2035. Therefore, they conclude that no limit to future groundwater withdrawals from these spring-sheds is required for the next two decades.

The latest Homosassa and Chassahowitzka MFLs are focused on snook thermal refuge habitat. These water bodies are at northern range of snook habitat and snook could not exist here if not for the winter thermal refuge of our springs. If snook habitat is so important, how does it make sense to reduce spring flow via these MFLs? Are snook an endangered/threatened species like manatees?

As groundwater pumping and sea level rise continues to increase, the salinity of our spring-fed coastal rivers increases. Sea level rise is a worldwide occurrence and there is little we can do locally to avert this. However, we can and should do something to reduce groundwater pumping that adds to the destruction of our coastal springs.

SWFWMD's peer review panel is currently discussing the draft reports. These drafts can be be found on SWFWMD's website https://www.swfwmd.state.fl.us/projects/mfl/documents-and-reports . All SWFWMD documents on this matter are available to the public as required by Florida public records law. You can also follow the peer review conversation at https://swfwmd.discussion.community/?forum=708493 .

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552833520

Here are the draft meeting summary notes. Adam and Dann, if you see anything that needs to be changed let me know. Thanks.

Chass_Homo MFLs Peer Rev Telcon Summ 2019-0...
263.73 KB

QUOTE 0 0

Registered Member
14 posts

abmunson
1552833794

Looks good.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Final Reports

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1552569114

Dann and Adam,

I had identified that I wanted to post the final reports prior to Friday for you to have one last look at the sections. I am a bit behind on where I wanted to be and I won't have the documents complete until tomorrow and will be posting them then. I have incorporated all of your comments/edits you have made on all of the sections individually. If you find any issues with the reports posted tomorrow, I can update them early next week to make sure the changes get to the District. Thanks.

Steve

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552682657

Just posting that we had an issue of our internet down all day today in our Gainesville Office where we are preparing the final reports. My technical editor has not been able to access my files remotely to input my final edits. We are hoping the internet will be back up this weekend and we will then finalize the reports and post before Monday am. Sorry for the delay.

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552864054

Attached is the Initial Chassahowitzka Peer Review Report.

Initial_Chassahowitzka_Peer_Review_Report_031...
894.49 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1552909101

Attached is the Initial Homosassa Peer Review Report.

Initial_Homosassa_Peer_Review_Report_031619....
839.66 KB

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1552915900

Steve-one minor edit on the Homosassa Report p. 2-20 comment #66. Change Chassahowitzka to Homosassa.

Great effort--thanks

dann

QUOTE 0 0

Registered Member
3 posts

Brad W. Rimbey
1553029678

Gentlemen,

If you haven't already read the 2009 MODERNIZING WATER LAW: THE

EXAMPLE OF FLORIDA by Christine A. Klein, Mary Jane Angelo, and Richard Hamann I suggest you do so. It is available for download online. This legal opinion document questions the legality of Florida's ongoing policy of allowing universal 15% anthropogenic degradation of all Florida waters.

No exception of the 15 % degradation is being made for Outstanding Florida Waters and Outstanding Florida Springs. Bluntly, one size does not fit all.

Perhaps one of you would like to comment on this in your peer review comments. I think your peer review responsibilities go beyond mere editorial tweaks.

Brad W. Rimbey P.E.

QUOTE 0 0

Registered Member
14 posts

abmunson
1553030059

Thank you Brad. I have met Richard Hamann and will read this but as an engineer and scientist and not a lawyer would.

QUOTE 0 0

Registered Member
3 posts

Brad W. Rimbey
1553125864

Thanks Adam. I am also an engineer and I have also met and talked with Richard Hamann. I was one of the listed petitioners in a legal challenge

questioning the continued degradation of supposedly legally protected Outstanding Florida Waters based on pseudo scientific guesswork. For me, the bottom line is that SWFWMD does not know what they had vs. what they have already lost. There can be no doubt that these OFWs have already been degraded by anthropomorphic activities but on it goes with the blessing of SWFWMD.

QUOTE 0 0

Mid-Review Documents for Peer Review Panel

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1556572880

Four *draft* documents developed by District staff in response to the peer review panel's initial peer review reports for the Chassahowitzka and Homosassa river systems are attached for the panel's consideration:

1) **District Response Chass 2019-04-29.pdf** (response document)
2) **District Response Homo 2019-04-29.pdf** (response document)
3) **Chass MFL mid review posted 2019-04-29.pdf** (revised minimum flows report)
4) **Homo MFL mid review posted 2019-04-29.pdf** (revised minimum flows report)

An additional post (or posts) will soon be made to provide additional updated or new documents.

District Response Chass 2019-04-29.pdf
165.21 KB

District Response Homo 2019-04-29.pdf
121.76 KB

Chass MFL mid review posted 2019-04-29.pdf
12.81 MB

Homo MFL mid review posted 2019-04-29.pdf
14.71 MB

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1556573193

Two *draft* documents developed by District staff in response to the peer review panel's initial peer review reports for the Chassahowitzka and Homosassa river systems are attached for the panel's consideration.

1) **Coastal_Chloride_History_updated_2019_revised.pdf**
2) **Chen 2019 SGD and Salinity.pdf**

An additional post (or posts) will soon be made to provide additional updated or new documents.

Coastal_Chloride_History_updated_2019_revised....
1.45 MB

Chen 2019 SGD and Salinity.pdf
2.12 MB

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1556573448

One *draft* document developed by District staff in response to the peer review panel's initial peer review reports for the Chassahowitzka River System is attached for the panel's consideration. The document is an updated modeling report that when finalized will replace the modeling report included as an appendix to the minimum flows report.

1) **Chen 2019 Chass LAMFE revised.pdf**

An additional post will soon be made to provide an additional updated document.

Chen 2019 Chass LAMFE revised.pdf
40.07 MB

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1556573597

One *draft* document developed by District staff in response to the peer review panel's initial peer review report for the Homosassa River System is attached for the panel's consideration. The document is an updated modeling report that when finalized will replace the modeling report included as an appendix to the minimum flows report.

1) **Chen 2019 Homo LAMFE revised.pdf**

This is the last of the documents to be posted today for the panel's consideration.

Chen 2019 Homo LAMFE revised.pdf
44.15 MB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chapter 2 Tables

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1558381767

Dann and Adam,

Attached are the Chapter 2 Tables pulled from the two reports. I have added a column to define if each of us feel that our comments have been addressed. This table, with the added column will replace the tables in the reports. Let me know if you have any questions or we can discuss on Wednesday. Thanks.

Steve

Homosassa_Peer_Review_Report_Tables_052019....
90.12 KB

Chassahowitzka_Peer_Review_Report_Tables_052...
90.06 KB

QUOTE 0 0

Yobbi's Preliminary Comments to District Review of Initial Peer Report

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member

24 posts

Dann Yobbi

1558383523

Steve--Attached is my preliminary comments on the District's Response to our initial review. Also attached is one of the referenced reports in my write up that may be of interest to the District.

zYobbiPrelimFindings.docx
90.27 KB

HarmelCumUncertain.pdf
384.11 KB

QUOTE 0 0

Participating

Member
49 posts

Steven Peene
1558521359

Attached are my initial comments on the District responses.

Peene - Initial Review of Districts Response to Co...
31.14 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa Minimum Flows Peer Review Teleconference - May 13, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Moderator
67 posts

Doug Leeper
1556803889

Teleconference agenda (**Agenda-Chass_Homo Peer Rev Telecon 2019-05-13.pdf**) prepared by Steve Peene and Doug Leeper is attached. Please note that this teleconference replaces the teleconference previously scheduled for May 6, 2019.

Agenda-Chass_Homo Peer Rev Telecon 2019-05-1...
76.21 KB

QUOTE 0 0

Moderator
67 posts

Doug Leeper
1557854958

An email and attachment submitted by Sid Flannery on May 14, 2019 are posted here by Doug Leeper. The documents concern comments provided by Sid Flannery during the May 13, 2019 peer review panel teleconference.

Email from SFlannery-Comms at peer review pane...
424.08 KB

Homo_Chass Comments_min flows process, SFlan...
405.39 KB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1558370870

Attached is a draft summary of the Panel Meeting. Dan and Adam, please review and let me know if you see any edits or changes that need to be made. We will discuss finalization of this summary at the next panel meeting. Thanks.

DRAFT Chass_Homo Telcon Summ 2019-05-13.pdf
433.12 KB

QUOTE 0 0

Registered Member
10 posts

Gabe Herrick
1558378501

Attached is Chassahowitzka hydrodynamic modeling report with appendix (H) that summarizes submarine groundwater discharge record with time series of flows, temperatures, and salinities.

Chass HydrodynamicModeling_FinalDraft.pdf
56.67 MB

QUOTE 0 0

Registered Member
10 posts

Gabe Herrick
1558379458

Attached are revised minimum flows reports for Homosassa and Chassahowitzka. Both have an added section 7.4 which details creation of the flow record for each system. These additions were made in response to comments at the May 13 teleconference, and will be discussed during the upcoming May 22 teleconference.

Chass MFL 2019-05-20.pdf
12.93 MB

Hom MFL 2019-05-20.pdf
15.00 MB

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1558720120

Attached please find the final summary for the May 13 Peer Review Panel Meeting.

Chass_Homo Telcon Summary 2019-05-13.pdf
427.27 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka-Homosassa MFL Peer Review Teleconference - May 22, 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1558367105

Please find attached the Agenda for the May 22 Teleconference. This agenda was prepared by Steve Peene, Doug Leeper, and Gabe Herrick.

Agenda-2019-05-22-ChassHomPeerTelecon.pdf
76.94 KB

QUOTE 0 0

Registered Member

6 posts

Adam Munson
1558368151

Hi Steve - Were you going to put out a table for us to fill in. The short answer is I am satisfied with the Districts responses but I left the last meeting thinking you were going to format the table in some way you wanted and were would make those statements. The only complete version I have is a PDF.

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1558370581

Hi Adam,

I will be posting the tables to fill in today. I had hoped to get them out late last week but didn't get there.

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1559057895

Dann and Adam,

Attached is a Draft summary of the teleconference on May 22. Please review and we can discuss any changes or edits tomorrow on the call. Thanks.

Steve

DRAFT_Chass_Homo_Telecon_Summ_2019-05-22...
760.65 KB

QUOTE 0 0

Registered Member
6 posts

Adam Munson
1559136243

Here are my tables

Homosassa_Peer_Review_Report_Tables_052019...
178.08 KB

Chassahowitzka_Peer_Review_Report_Tables_052...
125.77 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

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SECTION 2 TABLES

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
24 posts

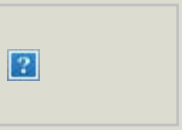
Dann Yobbi
1559144392

Steve--Attached are my updated tables

zzChassahowitzka_Peer_Review_Report_Tables_0...
91.06 KB

zzHomosassa_Peer_Review_Report_Tables_05201...
79.33 KB

QUOTE 0 0



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Chassahowitzka Homosassa Peer Review Teleconference - May 29 2019

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member

49 posts

Steven Peene

1558720452

Attached please find the agenda for the May 29 Peer Review Teleconference. Thank you.

Agenda-2019-05-29-ChassHomoPeerTelecon.pdf
143.20 KB

QUOTE 0 0

Registered Member

10 posts

Gabe Herrick
1559145403

Attached: Front matter for water quality appendices clarifying use of threshold chlorophyll values with respect to NNC in response to comments made during the May 13 teleconference.

Hom Chl Front Matter.pdf
34.71 KB

Chass Chl Front Matter.pdf
34.58 KB

QUOTE 0 0

Registered Member
10 posts

Gabe Herrick
1559145529

Attached: Revised MFLs documents with flow record generation moved forward from Chapter 7 to Chapter 2 in response to comments made during May 22 teleconference.

Hom MFL 2019-05-29.pdf
15.01 MB

Chass MFL 2019-05-29.pdf
12.92 MB

QUOTE 0 0

Registered Member
10 posts

Gabe Herrick

1559150157

To call in:

Join by phone

Toll number: +1 (786) 749-6127,,83435893# (Dial-in Number) English (United States)

Find a local number

Conference ID: 83435893

QUOTE 0 0

Results of Sensitivity Analysis and Results without Crab Creek Negative Flow

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

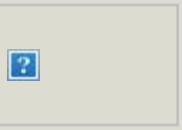
Registered Member
10 posts

Gabe Herrick
1559163945

Attached is report on sensitivity analysis and Crab Creek flows discussed in May 29 meeting.

Results of Chass&Homo Sensitivity Runs and More...
513.10 KB

QUOTE 0 0



Final Report Draft Sections for the Chassahowitzka

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1559057373

Dann and Adam,

Attached please find my draft rewrites through Section 2.1 for the final Peer Review Document for Chassahowitzka. I have left track changes on in the WORD document so that you can see the changes.

The rewrites reflect the approach taken to keep the initial peer review recommendations in place while addressing the District's responsiveness to our recommendations. I have put in capitals and bracketed, items I wish to discuss and finalize on the teleconference tomorrow.

We would then add the filled in tables for Section 2.2 which I provided to you earlier to fill out. The new tables had the column to identify if the District was responsive to your specific comment.

We will discuss the Section 3 tables tomorrow in detail to define consistent panel findings for those specific task items.

Talk with you both tomorrow.

Steve

Final_Chassahowitzka_Peer_Review_Report_0527...
555.47 KB

QUOTE 0 0

Registered Member
6 posts

Adam Munson
1559136047

This looks good to me.

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1559214341

Steve--I made a few edits for your consideration. Please ignore table of contents and bottom of page edits.

zzzFinal_Chassahowitzka_Peer_Review_Report_05...
550.94 KB

QUOTE 0 0

Draft Final Peer Review Report for Chassahowitzka

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1559320259

Dann and Adam,

Attached is the Draft Final Peer Review document for Chassahowtizka. Please review and let me know if my rewrites in Section 2.1 and the Executive Summary reflect our conversations on the 29th and the documents Gabe has uploaded in the last two days. Also, Dann if I have captured the changes needed in the Section 2.2 tables based on the recent documents provided and our discussion on Wednesday. Also, let me know if my consolidation of the Panel findings in the Section 3 Tasks is agreeable. I do have some clean up and add on for the references based on the recent postings, but I can do that for the final. After you have sent back any changes/edits I will finalize and post the reports.

I am working on the Homosassa Report, this may push into the weekend, but it

will be posted by Sunday at the latest.

Thank you both, it has been great working with you on this.

Steve

Draft_Final_Chassahowitzka_Peer_Review_Report...
619.35 KB

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1559334186

Steve-I see no problem with your write-ups of Sections 2.1 or 2.2 and your consolidation of our individual responses in Section 3. Attached is my review copy of the report with a few edits for your consideration.

thanks for all of your work finalizing this report

dann

zzzDraft_Final_Chassahowitzka_Peer_Review_Rep...
616.26 KB

QUOTE 0 0

Registered Member

14 posts

abmunson
1559399946

Steve, I read the final Chass report and agree that you have done an excellent job of synthesizing the report from our individual comments and conversations. You are an excellent chair and I appreciate all the additional work you do on behalf of the panel.

QUOTE 0 0

Participating Member
49 posts

Steven Peene
1559497696

Thank you Dann and Adam. I will incorporate the edits, finalize, and post the final report.

QUOTE 0 0

Draft Final Homosassa Peer Review Report

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1559497605

Dann and Adam,

Attached is the Draft Final Homosassa Peer Review Report. Please review and let me know any edits or changes. One point to note is that in the Initial Peer Review report we had some issues on the comment numbering. This is fixed in this one. As such, the comments numbers don't line up with the Initial Report fully.

Thanks.

Steve

Draft_Final_Homosassa_Peer_Review_Report_053...
576.20 KB

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1559512957

Steve-Attached is my review copy of the draft final Homosassa Report with a few edits for your consideration. I noticed that the report is dated May 2019 not June 2019 and you may want to change the Chass MFL report as well As Adam stated, thank you for all of the extra work you did for the Panel. Its been a pleasure working with you and Adam.

dann

zzzDraft_Final_Homosassa_Peer_Review_Report_...
572.55 KB

QUOTE 0 0

Registered Member
6 posts

Adam Munson
1559613352

Thanks for this Steve and Dann. I have no edits to add to Dann's which look good to me.

QUOTE 0 0

Final meeting summary for May 22

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
10 posts

Gabe Herrick
1560180869

Attached is the final meeting summary for the May 22 teleconference as approved by panel during May 29 meeting. No further action is required of the panel on this item.

Chass_Homo_Telecon_Summ_2019-05-22.pdf
736.80 KB

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Draft Meeting Summary May 29

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Registered Member
10 posts

Gabe Herrick
1560181109

Attached is a draft meeting summary from the May 29 teleconference.

Action Required: Adam and Dann, please approve or provide edits so that this can be finalized.

DRAFT_Telecon_Summ_2019-05-29_Draft_GH_SJ...
236.60 KB

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1560185370

Gabe--Looks good--no edits by me.

Dann

QUOTE 0 0

Registered Member
1 posts

KenNash
1560188372

Gabe,
Thanks for including my comments in the summary.
Ken Nash

QUOTE 0 0

Registered Member
6 posts

Adam Munson
1560190934

This seems an accurate account Gabe. Thanks.

QUOTE 0 0

Final Peer Review Reports for Chassahowitzka and Homosassa MFLs

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

Participating Member
49 posts

Steven Peene
1559943594

Attached please find the final Chassahowitzka and Homosassa Peer Review Reports. Thank you to everyone for their work through this Peer Review process.

Final_Homosassa_Peer_Review_Report_060719.pdf
850.00 KB

Final_Chassahowitzka_Peer_Review_Report_0607...
918.72 KB

QUOTE 0 0

Registered Member
10 posts

Gabe Herrick
1560181167

Dann and Adam, please review and approve these Final drafts of the peer panel reports.

QUOTE 0 0

Registered Member
24 posts

Dann Yobbi
1560184991

Gabe--I reviewed the reports this weekend and have no further comments or revisions.

Dann

QUOTE 0 0

Registered Member
6 posts

Adam Munson
1560191525

I review the last edited version and was good with them. I assume this pdf is of that with the suggested edits incorporated at Steves discretion and I am good with it.

QUOTE 0 0

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SWFWMD WebForum

Final meeting summary for May 29

Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

This topic is locked. No new replies will be accepted.

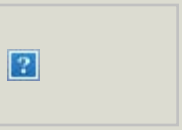
Registered Member
10 posts

Gabe Herrick
1560193231

Attached is the final meeting summary for the May 29 teleconference as approved by all panelists.

FINAL_Telecon_Summ_2019-05-29.pdf
495.79 KB

QUOTE 0 0



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TELECONFERENCE NOTICE

AGENDA

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

MONDAY, FEBRUARY 18, 2019
1:00 PM TO 4:00 PM

PLACE

Teleconference call-in number: 1(786)749-6127; Participant passcode: 39877699#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/L3YSTSQ4

All meetings are open to the public.

1. Welcome and introductions facilitated by Doug Leeper, District MFLs Program Lead

2. Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Presentation/discussion of first round of comments/questions by each Panelist
   b. Data needs/questions to District staff
   c. Discussion of focus items and how to provide comments in next round for inclusion into reports

3. Public comment period facilitated by Doug Leeper

Participants will be asked to save their comments until the public comment portion of the teleconference. If you wish to speak during the public comment period, please inform the facilitator, who will call on you at the appropriate time during the teleconference. Comments will be limited to three minutes per speaker. In appropriate circumstances, the facilitator may grant exceptions to the three-minute limit.

For questions or to submit additional public comment on the peer review of the proposed minimum flow for the Chassahowitzka and Homosassa River Systems, please use the Web Board at https://swfwmd.discussion.community/categories that has been established to allow public access to and participation in communications among the chairman and members of the independent peer review panel created to conduct the peer review. The Web Board will be available for public viewing from February 8, 2019 through December 31, 2019, and will be available for public comment from 8:00 a.m. on February 8, 2019, through 5:00 p.m. on May 31, 2019. Questions or additional public comment may alternatively be submitted to MFLComments@WaterMatters.org or to Doug Leeper by email at doug.leeper@watermatters.org, by telephone at 352-397-7840 or 1-800-423-1476 or 352-796-7211, extension 4272, or by mail at the address listed at the top of this agenda.

For persons without access to the Internet, access to the Web Board during the public comment period is available at the headquarters office of the Southwest Florida Water Management District, 2379 Broad Street, Brooksville, Florida, 8:00 a.m. – 5:00 p.m., Eastern Daylight Time, Monday through Friday.

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Bartow, FL 33830-7700
863-534-1448 or 1-800-492-7862

Sarasota Office
6750 Fruitville Road
Sarasota, FL 34240-9711
941-377-3722 or 1-800-320-3503

Tampa Office
7601 US Highway 301 North
Tampa, FL 33637-6759
813-985-7481 or 1-800-836-0797

TELECONFERENCE MEETING SUMMARY

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

Facilitated from the District Headquarters in Brooksville, Florida

February 18, 2019

The Southwest Florida Water Management District (District) organized and facilitated a teleconference (via telephone and internet-based conferencing tool) of the independent scientific peer review panel reviewing draft District reports on proposed minimum flows for the Chassahowitzka and Homosassa River systems. The teleconference was advertised in the Florida Administrative Register and on the District's web site. In addition, numerous interested parties and local government staff and officials were notified of the event.

The teleconference was held from 1:00 p.m. to approximately 3:30 p.m. on February 18, 2019. Participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Doug Leeper, MFLs Program Lead; Ron Basso, Chief Hydrogeologist; XinJian Chen, Chief Professional Engineer; Gabe Herrick, Senior Environmental Scientist; Natasha Mendez-Ferrer, Staff Environmental Scientist; Sky Notestein, Springs & Environmental Flows Manager; Frank Gargano, Government Affairs Regional Manager; Adrienne Vining, Assistant General Counsel; Chris Tumminia, Deputy General Counsel; Mike Bray, Assistant General Counsel; and Hillary Ryan, Staff Attorney.

The teleconference was initiated by Doug Leeper with a brief review of the planned agenda (attached to this teleconference summary) and identification of meeting participants. No stakeholders acknowledged their participation in the teleconference.

Steve Peene subsequently led a discussion of each panelist's initial, i.e., first-round of comments and questions associated with the review. For this discussion, each panelist, in-turn, summarized their initial comments and questions, using the documents each had previously posted to the review webforum as a guide.

Dann Yobbi

- Noted that the District reports are of high-quality, well written, and representative of an extensive work effort that demonstrate a commitment by the District to build upon and improve the analyses completed for development of the currently established minimum flows for the two river systems.
- Pointed out that the comments provided are not final comments but initial comments that may change.
- Requested clarification regarding the District's position regarding whether the panel should review use of 15% change criteria for minimum flow development or should consider such use to be a policy decision of the District Governing Board that is not subject to review by the panel.
- Regarding use of 15% change criteria, suggested that it may be reasonable to consider differing percentage-changes when establishing minimum flows for differing water body/system types and resources.

- Emphasized that the District should use a conservative approach for minimum flow development, based in part, on a lack of characterization of uncertainty associated with analyses used for development of the minimum flow recommendations.
- Noted that data available for Blind Spring are sparse, and it seemed appropriate for the District to advance that the minimum flow recommendations developed for the Chassahowitzka River System are also applicable to Blind Spring.
- Raised questions on why the LAMFE model was chosen over other more publicly used or established models. Also asked how the model would deal with higher salinities under a sea level rise scenario.
- Raised a question on the percent of flow approach for the MFLs. Identified that in other MFLs peer review there were questions on dealing with low, medium and high flow conditions and potentially identify differing levels for each.

<u>Steve Peene</u>

- Noted that the District reports are of high-quality, well written, and representative of an extensive work effort that demonstrate a commitment by the District to build upon and improve the analyses completed for development of the currently established minimum flows for the two river systems.
- Also requested clarification regarding the District's position regarding whether the panel should review use of 15% change criteria for minimum flow development, or should consider such use to be a policy decision of the District Governing Board that is not subject to review by the panel.
- Regarding use of 15% change criteria, noted that its application for assessment of change in differing resource types or classes (e.g., habitat and water quality parameter targets) should be carefully considered.
- Identified the need to further review water quality assessments conducted by the District and its consultant with regard to presentation and use of this information for supporting the recommended minimum flows. The issue was specific to how the Chl a criteria was utilized in their analyses and if the use of an allowable 15% increase in the number of exceedances was consistent with State water quality criteria.
- With regard to the water quality analyses, indicated it is worth noting that the District analyses focused, in part, on chlorophyll concentrations in the water column, while algal mats (i.e., filamentous, benthic algae) have been identified as resource concerns in west-central Florida coastal river and elsewhere.
- Noted that the hydrodynamic modeling responses for the two river systems exhibit some differences that are likely associated with physical differences between the systems.
- Noted that the data used for the hydrodynamic models of the river systems was among the best that he is aware of for modeling that supports development of environmental flows.
- Identified several suggestions for improving presentation of modeling information and results.
    - Suggested that given the extensive data collection effort and therefore available data, more text could be provided that describes the system behavior gleaned directly from the data.
    - Need to present the data sources used for the depths in the model, and how those depths were applied to the model.
    - Suggested that the reports would benefit from a more direct identification of the baseline (and other) flow records used for the analyses described in the draft minimum flow reports. This includes the total flows, how the total flows were distributed in the model, and what salinity and temperature conditions were applied to each inflow.

    - The model report identified that the measured flows at the station Chassahowitzka near Chass would be used for the model calibration, but no plots showing the comparison were provided in the report.
    - Identified that some of the measured time series of temperature and salinity were utilized in the upstream boundaries for the Homosassa model. Then in the report those stations were presented as calibration results. Identified that this is not appropriate and asked that if measured time series are used as model inputs those stations should not be presented as a calibration result.
    - Recommended adding the RMS error statistics
- Recommended some analyses that could be conducted to address potential questions concerning data infilling or estimation techniques that were used specifically for the non-measured downstream boundary conditions for the Homosassa model.
- Identified that the initial review of the water level and salinity comparisons indicate the model is performing well.
- As a general comment, identified that it would be good to clearly state the sources that came up with the final full time series of SGDs used in the modeling and any other analyses, and present that time series clearly labeled as the final one used.
- Discussed use of the District's LAMFE hydrodynamic model and use of more generally-used models such as the EFDC model.
- Revisited the discussion of standards and approaches that may be applicable for hydrodynamic model calibration and verification.

Adam Munson

- Noted that the District reports are of high-quality, well written, and representative of an extensive work effort that demonstrate a commitment by the District to build upon and improve the analyses completed for development of the currently established minimum flows for the two river systems.
- Also requested clarification regarding the District's position regarding whether the panel should review use of 15% change criteria for minimum flow development, or should consider such use to be a policy decision of the District Governing Board that is not subject to review by the panel.
- With regard to the 15% change criteria, suggested that it may be useful to conduct some type of meta-analyses to investigate use of the approach based on its application for numerous water bodies/systems.
- Noted that data available for Blind Springs are sparse, and it seems appropriate for the District to advance that the minimum flow recommendations developed for the Chassahowitzka River System are also applicable to Blind Springs.
- Noted that the District may want to consider enhanced data collection/monitoring for submersed aquatic vegetation (including filamentous algae) for future characterizations of the river systems.
- Questioned whether carrying-capacity information should be considered or incorporated into the thermally-based habitat assessments for Common Snook.

This discussion was followed by a request from Steve Peene for the panel to identify any data requests for District staff.

- The need for the model files for each river system was re-iterated to allow the models to be run.

  Note: District staff posted this requested information to the webforum following the teleconference.

The panel then discussed their next steps concerning refinement and compilation of their initial, individual comments.

- Steve Peene indicated he planned to begin developing a narrative summary of the panel's general comments and consolidating individual panelist's initial comments into a single document for subsequent review/revision by the full panel.
- The panel determined they would continue this summarization of their initial comments/questions at the next panel teleconference.
- The panel determined they would likely begin discussing development of responses to the specific questions posed by the District in then scopes of work developed with each panelist.

Doug Leeper then offered any participating stakeholders the opportunity to provide public comment on the peer review.

- No public comment was provided.

Meeting Agenda

Southwest Florida Water Management District
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TELECONFERENCE NOTICE

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Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/L3YSTSQ4

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TELECONFERENCE NOTICE

AGENDA

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

MONDAY, FEBRUARY 25, 2019
1:00 PM TO 4:00 PM

PLACE

Teleconference call-in number: 1(786)749-6127; Participant passcode: 4633531#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/1S5C4LQZ.

All meetings are open to the public.

1. Welcome and introductions facilitated by Doug Leeper, District MFLs Program Lead

2. Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Presentation/discussion of second round of comments/questions by each Panelist
   b. Discussion of the specific questions/determinations outlined in Tasks 5.1 through 5.6
   c. Review of the organization/structure of the report to be completed prior to the next panel meeting and how specific and general comments will be presented within the report

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Scientific Peer Review Panel Teleconference
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Facilitated from the District Headquarters in Brooksville, Florida

February 25, 2019

The Southwest Florida Water Management District (District) organized and facilitated a teleconference (via telephone and internet-based conferencing tool) of the independent scientific peer review panel reviewing draft District reports on proposed minimum flows for the Chassahowitzka and Homosassa River systems. The teleconference was advertised in the Florida Administrative Register and on the District's web site. In addition, numerous interested parties and local government staff and officials were notified of the event.

The teleconference was held from 1:00 p.m. to approximately 2:30 p.m. on February 25, 2019. Participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Doug Leeper, MFLs Program Lead; Ron Basso, Chief Hydrogeologist; XinJian Chen, Chief Professional Engineer; Gabe Herrick, Senior Environmental Scientist; Sky Notestein, Springs & Environmental Flows Manager; and Frank Gargano, Government Affairs Regional Manager. No stakeholders acknowledged their participation in the teleconference.

The teleconference was initiated by Doug Leeper with a brief review of the planned agenda (attached to this teleconference summary) and identification of meeting participants. Doug Leeper also briefly addressed the previously raised panel questions concerning their review of the District's use of criteria associated with a 15% change in habitat/resource relative to conditions that would exist in the absence of withdrawal impacts.

Steve Peene then asked the other panelists if they had any recommended changes concerning the draft summary of the panel's 2/18/2015 teleconference. No changes were identified and Steve Peene indicated he would post the meeting summary on the webforum.

Steve Peene subsequently led a discussion of each panelist's second-round of comments and questions associated with the review. For this discussion, each panelist summarized their individual comments and questions, using the documents each had previously posted to the review webforum as a guide.

<u>Dann Yobbi</u>

- Summarized the preliminary general comments included in two documents posted to the webforum on 2/25/2019.
- Identified that one potential issue is that when flow reductions occur, the salinity levels in the springs may increase. These are dealt with in the hydrodynamic model as boundary conditions attached to the SGD inflows in the model. In the future condition runs these boundary conditions, as prescribed in the model, do not change.
- Based on the issue raised above the panel discussed potential approaches for conducting sensitivity analyses associated for salinity associated with upstream boundary conditions (i.e., associated with salinity of water discharged from springs that contribute flow to the systems). Also, asked if there are ways that could be used to

project how the salinity in the SBD may change under the reduced flow conditions. Regarding this issue, Ron Basso noted that during public outreach activities associated with development of the currently established minimum flows for the system, groundwater modeling associated with movement of the saltwater/freshwater interface and chloride trends in the coastal monitoring network in the area were reviewed and discussed. He added that this information could be made available to the panel upon request.

- Asked about the sequential presentation of hydrodynamic modeling results in the District report developed to support the currently established minimum flows for the Homosassa River System.

Adam Munson

- Summarized the preliminary general comments included in a document posted to the webforum on 2/25/2019.
- Emphasized the District should carefully consider general statements within the draft minimum flow reports that assign levels of confidence or precision to model types.
- Asked about differences in flow-related salinity responses associated with the modeling efforts used to support the currently established and proposed minimum flows for the Homosassa River System. Specifically, through the last effort, salinity habitat assessments identified a potential 3% reduction. This time, those same analyses identified higher levels on the order of 11%. Raised the question of why the differences. Doug Leeper and XinJian Chen highlighted differences between the two efforts, including those associated with the model domain (grid), length of simulation periods and availability of boundary condition information. The previous model grid for the Homosassa was brought up which illustrated some of the issues with how the system was previously modeled.

Steve Peene

- Focused on a discussion of the water quality analyses used to support development of the proposed minimum flows. Indicated that the District should be careful in its characterization and presentation of these analyses to minimize their misinterpretation by readers of the draft minimum flow reports. Specifically identified that the use of the Numeric Nutrient Criteria using temporal and spatial assumptions not consistent with how the criteria were set should not be done.
- With regard to this issue, led a panel discussion concerning appropriate methods for consideration of water quality information in minimum flow studies.

Next, the panel discussed tasks and scheduling for development of the Panel's initial peer review reports for the two river systems. Specific topics addressed included:

- Plans for each panelist to, by 3/1/2010: obtain an updated version of an "MFL Review Guidelines" form from the web forum; fill-in the form for each river system and post their filled in forms to the webforum.
- Compilation of the filled-in forms and development of a general comments section in draft initial reports by Steve Peene for consideration during the 3/4/2019 panel teleconference.
- Planned discussion and review of the draft initial peer review panel reports during the 3/4/2019 panel teleconference.
- Continued panel review and comment on the draft initial peer review panel reports through 3/7/2019.
- Development and posting of a revised, initial draft peer review panel reports prior to and for discussion during the 3/11/2019 panel teleconference.

- Posting of the initial panel peer review reports by 3/15/2019.

Doug Leeper then offered any participating stakeholders the opportunity to provide public comment on the peer review.

- No public comment was provided.

Meeting Agenda

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TELECONFERENCE NOTICE

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TELECONFERENCE NOTICE

AGENDA

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

MONDAY, MARCH 4, 2019
1:00 PM TO 4:00 PM
PLACE

Teleconference call-in number: 1(786)749-6127; Participant passcode: 55780723#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/H8D1WYV1.

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   a. Finalize summary for the 2/25/2019 Panel teleconference
   b. Opportunity for Panel members to raise any further comments/questions for discussion with Panel members and/or District staff
   c. Discussion of the Draft Reports sections provided to date
      Section 1.0
      Section 2.1
      Section 3.0
   d. Discussion of detailed comment table to come and what to fill in
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TELECONFERENCE MEETING SUMMARY

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

Facilitated from the District Headquarters in Brooksville, Florida

March 4, 2019

The Southwest Florida Water Management District (District) organized and facilitated a teleconference (via telephone and internet-based conferencing tool) of the independent scientific peer review panel reviewing draft District reports on proposed minimum flows for the Chassahowitzka and Homosassa River systems. The teleconference was advertised in the Florida Administrative Register and on the District's web site. In addition, numerous interested parties and local government staff and officials were notified of the event.

The teleconference was held from 1:00 p.m. to approximately 2:10 p.m. on March 4, 2019. Participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Ron Basso, Chief Hydrogeologist; XinJian Chen, Chief Professional Engineer; Gabe Herrick, Senior Environmental Scientist; Doug Leeper, MFLs Program Lead; and Sky Notestein, Springs & Environmental Flows Manager. Two stakeholders, Martyn Johnson and Brad Rimbey, acknowledged their participation in the teleconference.

The teleconference was initiated by Doug Leeper with a brief review of the planned agenda (attached to this teleconference summary) and identification of meeting participants.

Steve Peene then asked the other panelists if they had any recommended changes concerning the draft summary of the panel's 2/25/2015 teleconference. No changes were identified and Steve Peene indicated he would post the meeting summary on the peer review webforum.

Steve Peene then provided an opportunity for the panel members to provide any additional comments, questions or discussion topics either within the panel or with District staff. None of the panel members had any additional topics to discuss and identified that their issues/comments/questions had been addressed in previous panel meetings.

Steve Peene then went over the portions of the Homosassa and Chassahowitzka Peer Review Reports that had been posted to the Web Forum on Saturday, March 2nd and Monday, March 4th, respectively. He identified that the following sections of the reports had been posted.

- Section 1.0 – Introduction, which includes the Background and System Description, the Regulatory Basis for the MFL and Peer Review, the Documents and Data Utlized in the Peer Review, and the Peer Review Panel Scope and Approach,
- Section 2.1 – The first section of the Review of MFL Report and Supporting Documentation. Section 2.1 includes the general comments on the key items that the panel had identified to develop general comments.
- Section 3.0 – Summary of Findings and MFL Review Guidelines Response, this is the section where each reviewer answers the specific scope questions raised by the District.

Steve Peene then went through each section to ask if there were any comments. He stated that he understood given the short time period for review that additional comments may come after the other panel members have more time to review.

Under Section 1.0, Dann Yobi identified that one of the reports referenced listed 2018 when it should be 2019. He asked that the Peer Review by Anderson and Stewart of the NDM be provided in the list. He also requested that all references be checked. Adam Munson identified that he did not have any additional comments at this time.

Under Section 2.0, Dann Yobi stated that he did not see any issues. Adam Munson identified that he would like to see a unified statement on the 15% harm criteria rather than the individualized by reviewer statements provided and that he felt that as a panel we were generally in agreement in the responses. Dann Yobi agreed. Steve Peene stated that he would work on a draft of a unified statement and then post to the Web Forum.

Under Section 3.0 no comments were provided at this time.

Steve Peene identified that as the reviewers provided any additional comments these would be incorporated into the report.

Questions came up regarding how the two-part review process would work. Specifically, the discussion centered around if the Peer Review Report would be changed under the second part of the review process based on changes made in the analyses and reports in response to the first round of Peer Review comments. It was identified that the MFL reports and supporting documentation may change based on the Initial Peer Review Report and then the Peer Review Panel would provide a final Peer Review Report that may have different conclusions.

Dan Yobi asked if there has been any Stakeholder comments provided to date. Doug Leeper identified that none have been provided so far.

Steve Peene then identified that following the meeting and prior to the next meeting he would be posting certain report parts for review. He identified that he would be posting the detailed comments (Section 2.2) for the panel members to edit and fill in portions. He identified that what they would get would be their specific comments provided to date in the table format. They would need to edit those specific comments or add to them and also fill in the parts of the table on if the comments materially impact the MFL and any proposed remedy for the comment. Steve Peene identified for the material impact it was a Yes or No answer. Dann Yobi asked if they could put Maybe as an answer. Steve Peene identified that they could and that in the previous Peer Review report for Kings Bay, some reviewers filled in Maybe.

Steve Peene then closed the panel discussion.

Before closing the teleconference, Doug Leeper offered any participating stakeholders the opportunity to provide public comment on the peer review. Two stakeholders opted to provide input on the review process, as follows.

Brad Rimbey

- Noted that he believed the proposed minimum flows are intended to degrade the two river systems.
- After noting that the existing minimum flows for the two river systems were subjected to a legal challenge several years ago, and that the State of Florida had provided no basis for their final legal decision regarding the challenge, encouraged the review panelists to comment on this issue.

- Noted that based on his professional experience and discussions with others, it is appropriate to "be conservative" when making resource management decisions when data are lacking.
- Suggested that the review panelists look at peer review recommendations for other systems for which the District has established minimum flows.
- Noted that use of Common Snook habitat as an indicator or criterion for minimum flow development seems ridiculous.
- Commented on District authorship of the draft minimum flow report for the Chassahowitzka River System. Specifically wondering why certain staff members were not identified as authors on the document.
- Suggested that the review panelists look at an existing review of the Northern District Model for conclusions/recommendations that indicate such a regional model should not be used the way the District is using it for minimum flow development.
- Noted that the District does acknowledge changes in salinity in coastal systems such as the Chassahowitzka and Homosassa River systems, but incorrectly attributes the change wholly to sea level rise, rather than correctly identifying lack of freshwater flow in the systems as a significant contributor to observed salinity changes.
- Suggested the review panelists think about how the proposed minimum flows for the two river systems vary (those proposed for the Chassahowitzka River System would allow up to an 8% reduction in flows that would exist in the absence of withdrawal impacts, and those for the Homosassa River System would allow up to a 5% reduction in flows that would exist in the absence of withdrawals), given their close proximity.
- Indicated he would be happy to provide a tour of sites in the Chassahowitzka River System to any of the peer review panelists.

<u>Martyn Johnson</u>

- Noted that many of the comments he planned to present during the teleconference were also included in an email recently sent to Doug Leeper.
- Noted that the review panelist should consider reviewing page 136 and 137 in the draft minimum flow report for the Homosassa River System, adding that the river is "dead" when compared to conditions that have occurred over the past approximate 18 years.
- Referring to page 33 of the draft Homosassa minimum flow report, suggested that the described manipulation/hindcasting of flow data opens some questions or issues.
- Noted that the draft Homosassa River System report indicates flow in Halls River and the Southeast Fork of the Homosassa River are strongly correlated, and suggests the review panelist look carefully at this conclusion.
- Noted that a flow of approximately 102 cubic feet per second has been used/reported in or for Northern District Model applications, and wonders what flow values for Halls River have been used in modeling for the currently proposed minimum flows.
- Notes that LAMFE model (a hydrodynamic model) output presented in Appendix 6 to the draft Homosassa report should be compared to similar model output presented in the District report that summarizes work that supported establishment of the currently adopted minimum flows for the system. Provided specific references to information in Appendix 6: pages 42, 42 (Tables 9, 10 and 11).
- Asked whether the current modeling efforts were based on the same or updated bathymetric data for the river system.
- Noted that comparisons of salinity or specific conductance information that is available for springs that discharge to the Southeast Fork of the Homosassa River and those that contribute flow to the Main Spring Run bowl provide good examples of seawater ingress into some of the system springs.

Meeting Agenda

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   b. Opportunity for Panel members to raise any further comments/questions for discussion with Panel members and/or District staff
   c. Discussion of the Draft Reports section 2.2 Tables
   d. Discussion of the other Sections of the Reports
   e. Steps and timing to complete the initial Peer Review Reports

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The teleconference was held from 9:00 a.m. to approximately 9:25 a.m. on March 11, 2019. Participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Ron Basso, Chief Hydrogeologist; XinJian Chen, Chief Professional Engineer; Frank Gargano, Government Affairs Regional Manager; Gabe Herrick, Senior Environmental Scientist; Doug Leeper, MFLs Program Lead; Sky Notestein, Springs & Environmental Flows Manager; and Hillary Ryan, Staff Attorney. Two stakeholders, Martyn Johnson and Brad Rimbey, acknowledged their participation in the teleconference.

The teleconference was initiated by Doug Leeper with a brief review of the planned agenda (attached to this teleconference summary), identification of meeting participants and discussion of future activities associated with the review process.

Steve Peene then asked the other panelists if they had any recommended changes concerning the draft summary of the panel's 3/4/2019 teleconference. No changes were identified and Steve Peene indicated he would post the meeting summary on the peer review webforum.

Steve Peene then provided an opportunity for the panel members to raise any additional comments, questions for discussion with the Panel or District staff. None of the panel members had any additional topics to discuss and identified that their issues/comments/questions had been addressed in previous panel meetings.

Steve Peene then led a discussion of the Panel's Draft Reports section 2.2 tables and other sections of the report. He asked if anyone had any changes to the tables. None of the panel members did.

Steve Peene then asked if the panel members wanted to discuss any of the other sections including the write-up of the significant harm provided previously. None of the panel members wanted to discuss.

Steve Peene then outlined Panel plans/activities for the remainder of the week in support of the Panel's planned posting of their initial Peer Review Panel Reports on the webforum by this Friday (3/15/2019).

Steve Peene then closed the panel discussion.

Before closing the teleconference, Doug Leeper briefly reviewed future activities planned for the review process, and offered any participating stakeholders the opportunity to provide public comment on the peer review. Two stakeholders opted to provide input on the review process, as follows.

Martyn Johnson

- Expressed disappointment regarding an apparent lack of comparisons between hydrodynamic modeling efforts for the current minimum flow reevaluations and those conducted previously in support of the existing, established minimum flows for the two river systems.
- Indicated concurrence with input provided during the teleconference by Brad Rimbey regarding the District's use of a temperature-based snook habitat criterion to support minimum flow development.

Brad Rimbey

- Expressed concern about using a criterion based on thermally-favorable habitat for snook, rather than criteria based on thermally-favorable habitat for manatee for establishing the recommended minimum flows. Noted that the approach for use of these criteria does not seem to make sense. Commented that snook are relatively common in the Homosassa River System, where they can be observed in high numbers near in the spring "fishbowl" during cold periods. Finally, noted that snook are present in the Chassahowitzka River System, but seem to be less common than in the Homosassa River System.
- Thanked panelist Dann Yobbi for his contributions to the initial panel review efforts.

Meeting Agenda

Southwest Florida Water Management District
2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
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TELECONFERENCE NOTICE

AGENDA

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

MONDAY, MARCH 11, 2019
9:00 AM TO 11:00 AM
PLACE
Teleconference call-in number: 1-786-749-6127; Participant passcode: 99750789#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/H4CK1M9N.

All meetings are open to the public.

1. Welcome and introductions facilitated by Doug Leeper, District MFLs Program Lead
2. Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Finalize summary for the 3/4/2019 Panel teleconference
   b. Opportunity for Panel members to raise any further comments/questions for discussion with Panel members and/or District staff
   c. Discussion of the Draft Reports section 2.2 Tables
   d. Discussion of the other Sections of the Reports
   e. Steps and timing to complete the initial Peer Review Reports
3. Public comment period facilitated by Doug Leeper

Participants will be asked to save their comments until the public comment portion of the teleconference. If you wish to speak during the public comment period, please inform the facilitator, who will call on you at the appropriate time during the teleconference. Comments will be limited to three minutes per speaker. In appropriate circumstances, the facilitator may grant exceptions to the three-minute limit.

For questions or to submit additional public comment on the peer review of the proposed minimum flow for the Chassahowitzka and Homosassa River Systems, please use the Web Board at https://swfwmd.discussion.community/categories that has been established to allow public access to and participation in communications among the chairman and members of the independent peer review panel created to conduct the peer review. The Web Board will be available for public viewing from February 8, 2019 through December 31, 2019, and will be available for public comment from 8:00 a.m. on February 8, 2019, through 5:00 p.m. on May 31, 2019. Questions or additional public comment may alternatively be submitted to MFLComments@WaterMatters.org or to Doug Leeper by email at doug.leeper@watermatters.org, by telephone at 352-397-7840 or 1-800-423-1476 or 352-796-7211, extension 4272, or by mail at the address listed at the top of this agenda.

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TELECONFERENCE NOTICE

AGENDA

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

MONDAY, MAY 13, 2019
2:30 PM TO 5:30 MM
PLACE
Teleconference call-in number: 1-786-749-6127; Participant passcode: 53571924#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/FLP260HR

All meetings are open to the public.

1. Welcome, introductions and review process update facilitated by Doug Leeper, District MFLs Program Lead

2. Peer Review Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Opportunity for Panel members to discuss observations/issues associated with the District staff response documents, revised, draft minimum flow reports, and other revised/new documents or information.
   b. Discussion of steps/timing for remaining Panel tasks (teleconferences, webforum postings of Panelist findings, development of final peer review Panel report, etc.)
   c. Other items

3. Public comment period facilitated by Doug Leeper

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Scientific Peer Review Panel Teleconference Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

Review Process Update

May 13, 2019

Southwest Florida Water Management District

1

Minimum Flows

- The **minimum flow** for a given watercourse is the limit at which further **withdrawals** would be significantly harmful to the water resources of the area
- May use **independent scientific peer review**; the Florida DEP or District Governing Board is to give significant weight to the final report of the peer review panel

2

Peer Review Schedule

Event/Item	Start	End
Peer review initiated; conflict of interest forms completed	1/23/2019	1/23/2019
Publicly-noticed kick-off meeting and field trip, 8:30 am - 4:00 pm	2/08/2019	2/08/2019
WebForum (WebBoard): posting WebForum (WebBoard): viewing	2/08/2019 2/08/2019	5/31/2019 12/31/2019
Teleconference, 1:00 - 4:00 pm Teleconference, 1:00 - 4:00 pm Teleconference, 1:00 - 4:00 pm Teleconference, 9:00 - 11:00 am	2/18/2019 2/25/2019 3/04/2019 3/11/2019	2/18/2019 2/25/2019 3/04/2019 3/11/2019
Panelists post written review comments on web board and collaborate on an initial peer review panel report	2/11/2019	3/15/2019
Panel takes a brief hiatus while staff prepares response to initial peer review, and revised minimum flow reports	3/16/2019	4/21/2019

COMPLETED

3

Peer Review Schedule (continued)

Event/Item	Start	End
Panelists review staff response to initial peer review and revised minimum flow reports	4/29/2019*	5/09/2019*
Teleconference, 2:30 - 5:30 pm Teleconference, 9:00 am- 12:00 pm Teleconference, 1:00 - 4:00 pm	5/13/2019* 5/22/2019* 5/29/2019	5/13/2019* 5/22/2019* 5/29/2019
Panelists post written review comments on web board and collaborate on a final peer review panel report	4/22/2019	5/31/2019
Panelists provide as-needed services (e.g., consultation, additional review, Governing Board presentation)	6/01/2019	12/31/2019

** Revised date*

4

Additional Activities/Events

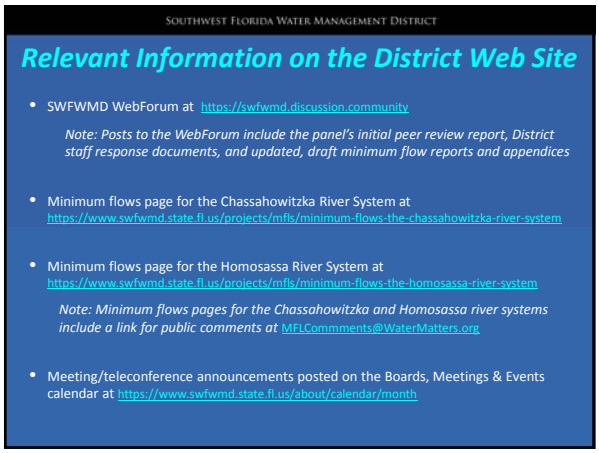
Activity/Event	Date
Public workshop on proposed minimum flows	6/11/2019
District Governing Board meeting: presentation of the peer review panel's final report, District staff response, public input, final minimum flow reports, and initiation of rulemaking	Fall 20109
Completion of rulemaking	by 12/31/2019

5

Peer Review Panelist's Charge

- Complete conflict of interest form
- Prepare monthly progress reports
- Review draft minimum flow reports and other appropriate materials
- Participate in meetings/teleconferences
- Collaborate on final peer review panel report to:
  - Determine whether District conclusions are supported by analyses/results presented
  - Determine whether data/information were properly collected and used, any data exclusions were justified, and the data were the best available information
  - Determine whether technical assumptions are clearly stated, reasonable and consistent with the best available information, and if better analyses could be used
  - Determine whether procedures and analyses were appropriate and reasonable, based on the best available data, correctly applied, limitations were handled appropriately, and conclusions are supported by the data
  - For methods judged to be not scientifically reasonable, describe scientific deficiencies, identify remedies, if any, or alternative methods
  - As appropriate, identify and characterize effort involved for preferred alternative methods that could be used in lieu of scientifically reasonable methods that were used.
- Provide as-needed follow-up services.
- Additional panel chair tasks: agenda & report preparation/posting; task assignments, etc.

6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7

TELECONFERENCE MEETING SUMMARY

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

Facilitated from the District Headquarters in Brooksville, Florida

May 13, 2019

The Southwest Florida Water Management District (District) organized and facilitated a teleconference (via telephone and internet-based conferencing tool) of the independent scientific peer review panel reviewing draft District reports on proposed minimum flows for the Chassahowitzka and Homosassa River systems. The teleconference was advertised in the Florida Administrative Register and on the District's web site. In addition, numerous interested parties and local government staff and officials were notified of the event.

The teleconference was held from 2:30 p.m. to 4:42 p.m. on May 13, 2019. Panel participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Chris Anastasiou, Chief Environmental Scientist, Ron Basso, Chief Hydrogeologist; XinJian Chen, Chief Professional Engineer; Frank Gargano, Government Affairs Regional Manager; Gabe Herrick, Senior Environmental Scientist; Doug Leeper, MFLs Program Lead; and Sky Notestein, Springs & Environmental Flows Manager. Two stakeholders, Ben Berauer, with the Friends of the Chassahowitzka, and Sid Flannery, acknowledged their participation in the teleconference.

The teleconference was initiated by Doug Leeper with participant introductions, followed by a brief discussion of the peer review process that included review of the process schedule, plans for relevant activities that will occur subsequent to the review process, the panelist's tasks, and web-based opportunities to learn more about and comment on the ongoing peer review and minimum flow development processes.

Steve Peene began the Panel discussion by summarizing plans for the meeting and outlining plans for the remainder of the peer review process. He requested that all Panel members post written comments on the District staff response and revised minimum flow documents to the webforum by 5/20/2019, in advance of the next Panel teleconference on 5/22/2019. Steve Peene indicated that following that meeting, he would post a draft final Peer Review Panel report to the webforum for review and discussion at the 5/29/2019 Panel teleconference, in anticipation of posting the final report to the webforum on 5/31/2019.

As part of the process discussion, Steve Peene facilitated discussion of the format that will be used for the final Peer Review Panel reports. He noted that it would be appropriate to use an approach based on amending the initial Panel reports, to highlight the Panel's initial findings and their comments on District staff responses to the initial reports. All agreed that this approach would be appropriate and useful.

Next, Steve Peene summarizing general comments and questions concerning the District staff response documents and revised minimum flow reports. The discussion that ensued involved both other panelists, Adam Munson and Dann Yobbi, and District staff. Adam Munson and Dann Yobbi were also afforded the opportunity to summarize their general comments and questions concerning the District staff response documents and revised reports. Their individual summarizations also involved much group discussion.

The discussion focused primarily on selected topics, including: the District's use of 15%-change criteria for minimum flows development; presentation of submarine groundwater discharge records used for the minimum flow analyses; differences concerning the characterization of the use of site-specific numeric nutrient criteria (NNC) as described in the reports and the associated water quality analyses appendices, and how to appropriately handle these differences; and modeling uncertainty/sensitivity.

The following summarizes discussions on specified topics raised at the meeting.

Significant Harm

Steve Peene identified that for this Peer review, the use of the 15% is the best available approach but provided a recommendation for the District to initiate a separate panel or expert group to provide an update/evaluation of the use of the 15% criteria outside of any specific MFL peer review.

Dan Yobbi stated that other peer review panels have identified problems with the 15%. The District needs to initiate some form of investigation on the overall science. Also recommended that he would like to see in this MFL some evaluation of the sensitivity of choosing another criterion, such as what would happen if a 10% value were chosen relative to the final MFL.

Adam Munson identified that the 15% criteria may be becoming tautological. He also provided a recommendation for a stand-alone study to look at the criteria now that it is nearly a decade old.

SGD Discharge

Steve Peene identified that within the MFL report, there is not a clear and concise discussion of the final SGD time series that was utilized in the MFL. While there are presentations of various gage records along with discussions of the formulae utilized to derive the final time series, there should be a summarizing section in the MFL report that presents the final time series (at a daily averaging scale if desired) that constitutes the full SGD utilized in the model and other analyses. Dan Yobbi agreed this would be helpful. Dan Yobbi also identified that he would like to see the time series of each of the SGD inputs to the models. This led to a discussion on including all of the boundary condition time series for flow, salinity, and temperature as an appendix to the modeling reports.

Salinity Changes due to Withdrawals

There was a significant discussion centered around the potential for salinity to increase in the SGD discharges under future withdrawals. The District identified that they do not have sufficient data to fully quantify how salinity may change under future withdrawal conditions. Dan Yobbi asked what data dis needed to understand what may happen to salinity changes at the spring heads, as there is still some uncertainty on whether or not salinity increases at the springs may take place. Dan stated he was not asking the District to attempt to address this issue for the current minimum flows effort but would like to see it addressed in the future. General discussion ensued with the determination made by the District that the data they do have at the moment does not appear to indicate that salinity levels will increase, but there is uncertainty.

Water Quality Report

Steve Peene stated that in the MFL report there were significant changes in the wording associated with the water quality analyses and their relationship to water quality criteria and the NNC. He asked if the District was also going to update the water quality report in the appendices which has similar language. The District indicated that the contracts for the reports are completed and they are not planning on updating the report. District staff suggested that it

may be appropriate to include a “front-sheet” with the water quality appendix to indicate that the water quality report was developed to support minimum flows development and the characterization and use of the NNC in the minimum flows report differs somewhat from the characterization and use of the NNC described in the water quality report. Alternatively, staff noted that information associated with the differing uses of the NNC in the minimum flows report and the appendix could simply be addressed in the body of the minimum flows report.

The panelists then identified if they felt their issues were addressed. Dan Yobbi stated that his only concern that was not fully addressed was the uncertainty analysis on the surface water modeling. Adam Munson identified that most everything he had identified had been addressed. Steve Peene identified that generally his comments were addressed outside of the items from the discussion.

Based on the Panel discussion, District staff agreed to develop an appendix to the Chassahowitzka system modeling report that summarizes the submarine groundwater discharge record used for the minimum flow analyses, and to include the record in the body of the minimum flows report. This included an appendix that would have time series of all of the boundary conditions used in the model including flow, salinity and temperature. Staff also agreed to post this information to the webforum in advance of the next Panel teleconference.

Steve Peene then closed the Panel discussion.

Before ending the teleconference, Doug Leeper offered any participating stakeholders the opportunity to provide public comment on the peer review. One stakeholder opted to provide input on the review process, as follows.

> Sid Flannery discussed minimum flow rule language development, touching on a number of topics, including: the legal and regulatory guidelines for minimum flows and levels; the District’s intent to develop minimum flows and associated rule language for protection of the flow regime of lotic ecosystems; recent and historical minimum flow rules and rule development by the District; and his opinion that the Peer Review Panel should evaluate proposed rule amendments associated with the reevaluation of minimum flows established for the Chassahowitzka and Homosassa river systems.

Note: Subsequent to the Panel teleconference, Sid Flannery submitted an email summary of the comments he provided during the teleconference and requested that they be posted to the webforum. Sid’s email and an associated attachment were posted to the webforum on 5/14/2019.

Meeting Agenda

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Meeting Presentation by Doug Leeper

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Review Process Update

May 13, 2019

Southwest Florida Water Management District

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Minimum Flows

- The **minimum flow** for a given watercourse is the limit at which further **withdrawals** would be significantly harmful to the water resources of the area
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Peer Review Schedule

Event/Item	Start	End
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Panel takes a brief hiatus while staff prepares response to initial peer review, and revised minimum flow reports	3/16/2019	4/21/2019

COMPLETED

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Peer Review Schedule (continued)

Event/Item	Start	End
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Panelists provide as-needed services (e.g., consultation, additional review, Governing Board presentation)	6/01/2019	12/31/2019

** Revised date*

4

Additional Activities/Events

Activity/Event	Date
Public workshop on proposed minimum flows	6/11/2019
District Governing Board meeting: presentation of the peer review panel's final report, District staff response, public input, final minimum flow reports, and initiation of rulemaking	Fall 20109
Completion of rulemaking	by 12/31/2019

5

Peer Review Panelist's Charge

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- Participate in meetings/teleconferences
- Collaborate on final peer review panel report to:
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  - Determine whether data/information were properly collected and used, any data exclusions were justified, and the data were the best available information
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  - Determine whether procedures and analyses were appropriate and reasonable, based on the best available data, correctly applied, limitations were handled appropriately, and conclusions are supported by the data
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- Provide as-needed follow-up services.
- Additional panel chair tasks: agenda & report preparation/posting; task assignments, etc.

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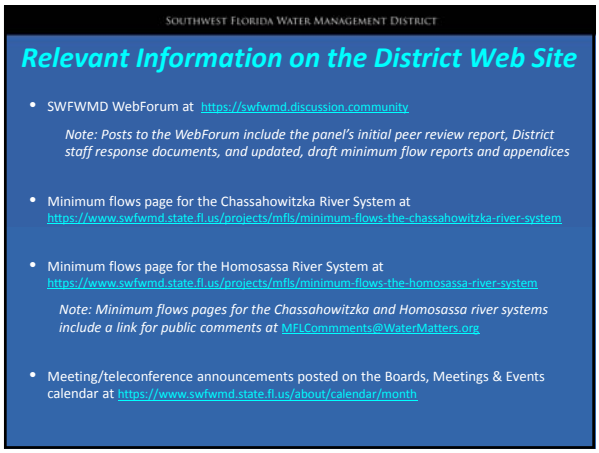
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TELECONFERENCE NOTICE

AGENDA

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Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

WEDNESDAY, MAY 22, 2019
9:00 AM TO 12:00 PM
PLACE
Teleconference call-in number: 1-786-749-6127; Participant passcode: 39086848#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/W5D18DC9

All meetings are open to the public.

1. Welcome and introductions facilitated by Gabe Herrick, District Senior Environmental Scientist

2. Discussion of flow records facilitated by Gabe Herrick

3. Peer Review Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Review and finalize summary from May 13 Panel Meeting.
   b. Opportunity for Panel members to discuss observations/issues associated with the District staff response documents, revised, draft minimum flow reports, and other revised/new documents or information.
   b. Discussion of draft documents posted by each Panel member in support of development of a final Peer Review Panel report.
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TELECONFERENCE MEETING SUMMARY

Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

Facilitated from the Tampa Service Office in Tampa, Florida

May 22, 2019

The Southwest Florida Water Management District (District) organized and facilitated a teleconference (via telephone and internet-based conferencing tool) of the independent scientific peer review panel reviewing draft District reports on proposed minimum flows for the Chassahowitzka and Homosassa River systems. The teleconference was advertised in the Florida Administrative Register and on the District's web site. In addition, numerous interested parties and local government staff and officials were notified of the event.

The teleconference was held from 9:00 am to 11:30 am. on May 13, 2019. Panel participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: Ron Basso, Chief Hydrogeologist; April Breton, Water Use Permit Manager; XinJian Chen, Chief Professional Engineer; and Gabe Herrick, Senior Environmental Scientist. Two stakeholders, Martyn Johnson and Ken Nash acknowledged their participation in the teleconference.

The teleconference was initiated by Gabe Herrick with participant introductions, followed by a brief discussion of the peer review process schedule and a description of changes made to hydrodynamic model reports and minimum flows reports in response to comments made at the previous May 13 teleconference. The panel discussed plots of discharge, temperature, and salinity at SGD inputs in the Chassahowitzka River modeling report that were added as appendix H. Gabe Herrick described changes made to MFLs reports in sections 7.4 where flow records for water quality analyses, hydrodynamic modeling, and general MFLs description were discussed. It was agreed that additional explanatory text would be added to the reports, including a table shown in presentation slides that highlights differences among flow records used, and rationale for those differences.

Steve Peene began the panel discussion by asking the other panelist present on the call (Dann Yobbi) if he had any changes to the draft summary that was provided for the May 13th meeting, Mr. Yobbi had no changes. Adam Munson joined the panel discussion at a point and when asked about the meeting summary also did not have any edits.

The panel then went on to discuss the written summaries provided by Steve Peene and Dann Yobbi which had been posted to the Webforum prior to the panel meeting. The written summaries addressed the Districts responses on specific recommendations made by the panel and presented in the Initial Panel Report. The panel started with the summary provided by Steve Peene which guided the overall discussion and included discussions of Mr. Yobbi's summary and comments by Adam Munson.

The first topic was the significant harm threshold of 15 percent habitat reduction. It was identified that while the panel is not looking for specific changes in the use of the 15 percent habitat change for the Homosassa and Chassahowitzka MFLs, the panel as a group did recommend that the District look to do a re-evaluation of the criteria perhaps through an expert

panel solely charged with examining the criteria and how it is being utilized outside of any individual MFL peer review.

The next discussion centered around SGD discharges and how they are presented in the MFL report. In the Initial Peer Review Report, the recommendation was made to provide a more complete presentation of how the total SGDs were derived, how they were utilized, and what the total SGD for the system was. It was recommended that this be included in a new section in the reports. Gabe Herrick, prior to the panel discussion period, made a slide presentation addressing this issue and outlining changes made to the MFL documents and the hydrodynamic modeling appendices to address the issues. A discussion ensued on the SGD discharges and overall it was determined that the District had provided sufficient new documentation. Two outstanding points were identified, one was that a table in the presentation that outlines the differences in the SGDs and how they were utilized be included in the new section. Additionally, it was identified that presently the District has located the new section in Chapter 7 which is well after other sections where the full SGDs are utilized. The recommendation was made that perhaps the section could be moved nearer to the beginning of the documents.

The next discussion centered around the potential for salinity increases in the SGDs under flow withdrawal scenarios. There was significant discussion on this point. The discussion included the new analyses provided by the District looking at correlations between salinity changes and flow changes. The Districts analyses indicated that salinities would not increase. Dann Yobbi provided analyses in his summary identifying where he did see increases in SGD salinities associated with flows. Additional key items from the discussion were Dann Yobbi's concerns on the uncertainty of the overall results given the uncertainty of the future changes in SGD salinity. The final recommendation from the panel through this discussion was that it would be useful to see the sensitivity of the final MFL results to increases in salinity in the SGDs. The District identified that it would discuss this recommendation following the meeting. The District also identified that they would discuss identifying in the report some potential for uncertainty in the future SGD salinity levels.

The next topic of discussion was recommendations made on the hydrodynamic modeling. Overall the discussion identified that the District addressed most of the recommendations made in the Initial Peer Review Report. One recommendation that was identified as not having been addressed was the request not to present stations where time series are utilized as boundary conditions also as calibration stations. Some discussion ensued on this topic, the final resolution was that the District would identify these stations as being utilized as input conditions and therefore would not be given the same weight as other stations. In the discussions of the hydrodynamic modeling, the issue of performing sensitivity on the SGD salinities was revisited to the same end as outlined above.

The final topic of conversation was the water quality analyses. The point was raised by the panel that the District did change the MFL documents to address the recommendations, but that the language in the water quality appendices was not updated in a similar manner. The panel recognized that the District would address this issue at the front of the water quality appendix. The panel finished by identifying that this may provide confusion in the future.

Adam Munson identified that overall the District addressed the comments/recommendations he had provided. Steve Peene then closed the panel discussion portion of the meeting.

Before ending the teleconference, Gabe Herrick offered any participating stakeholders the opportunity to provide public comment on the peer review. One stakeholder, Ken Nash discussed assessment of uncertainty, water budget, and human population growth projections and trends.

Meeting Agenda

Southwest Florida Water Management District
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Southwest Florida Water Management District
Scientific Peer Review Panel Teleconference
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

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PLACE
Teleconference call-in number: 1-786-749-6127; Participant passcode: 39086848#
Skype link: https://meet.lync.com/swfwmd-state/doug.leeper/W5D18DC9

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2. Discussion of flow records facilitated by Gabe Herrick

3. Peer Review Panel business/logistics facilitated by Doug Leeper, Steve Peene, Panel Chair, Adam Munson, Panelist, and Dann Yobbi, Panelist
   a. Review and finalize summary from May 13 Panel Meeting.
   b. Opportunity for Panel members to discuss observations/issues associated with the District staff response documents, revised, draft minimum flow reports, and other revised/new documents or information.
   b. Discussion of draft documents posted by each Panel member in support of development of a final Peer Review Panel report.
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   d. Other items

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863-534-1448 or 1-800-492-7862

Sarasota Office
6750 Fruitville Road
Sarasota, FL 34240-9711
941-377-3722 or 1-800-320-3503

Tampa Office
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Meeting Presentation by Gabe Herrick

5/22/2019

Peer Review Meeting May 22, 2019

1

Schedule

Event/Item	Start	End
~~Panelists review staff response to initial peer review and revised minimum flow reports~~	~~4/29/2019~~	~~5/09/2019~~
~~Teleconference, 1:30 - 5:30 pm~~ Teleconference, 9:00 am- 12:00 pm Teleconference, 1:00 - 4:00 pm	~~5/13/2019~~ 5/22/2019 5/29/2019	~~5/13/2019~~ 5/22/2019 5/29/2019
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Panelists provide as-needed services (e.g., consultation, additional review, Governing Board presentation)	6/01/2019	12/31/2019

2

Chassahowitzka and Homosassa MFLs flow records

3

Differences in Flow Records

Record	Missing Dates	Impacts	Inputs
LAMFE	Not filled	Constant	Gage(s) plus add'l
WQ	Filled	Scaled	Gage(s) only
MFL	Not filled	Scaled	Gage(s) only

4

Hydrodynamic model (LAMFE)

- Period of Record: October 11, 2007 through February 15, 2018
- It is estimated that the existing withdrawal causes about 1.4% reduction of SGDs in Chassahowitzka. As such, the BSL is obtained by dividing the existing SGDs by 0.986. (no gradual ramping)
- Flows at main (02310650) gage are supplemented with additional flows which are proportions of gaged flows.
- See section 4.1 of revised Hydrodynamic modeling report.
- Appendix H plots flows, salinity, temperature at all SGD inputs.
- Chapter 3, p.24 details flow fractions at input locations

5

Water Quality

- A complete record is needed without missing days
- Described in section 3.5.1
- Index velocity and regression data used
- Missing data filled in with linear regression between gaged flows and water levels in Weeki Wachee well and replacement well
- Further missing data filled in with linear interpolation
- Impacts scaled according to dates

6

Impact-Date Scaling

Starting Date	Ending Date	Chass Impact	Homosassa Impact
Jan 1, 1975	Jan 1, 2005	0 to 1.0%	0 to 1.1%
Jan 1, 2005	Jan 1, 2010	1.0% to 1.3%	1.1% to 1.8%
Jan 1, 2010	Jan 1, 2015	1.3% to 1.4%	1.8% to 1.9%
Jan 1, 2015	Latest approved	1.4%	1.9%

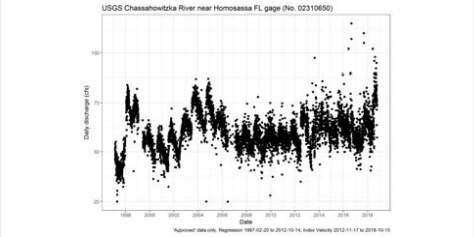
Year	Chass Impact	Hom Impact
2005	1.0%	1.1
2010	1.3%	1.8
2015	1.4%	1.9

7

Flow Record for Chass section 7.4

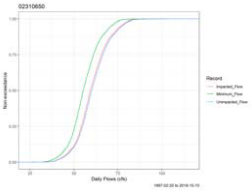
- USGS Chassahowitzka River near Homosassa, FL gage (No. 02310650)
- Regression and Index velocity
- The combined record consists of 6912 observations over 7908 days from 1997-02-20 to 2018-10-15.
- Missing dates were not in-filled with data from other sources or interpolation between dates.
- Impacts scaled according to dates

8



9

Chassahowitzka Flow Duration



10

Chassahowitzka Flow Statistics

Record	min	10th	25th	mean	median	75th	90th	max
Unimpacted	25	49	55	61	60	66	73	117
Impacted	25	49	54	60	59	66	73	115
Minimum	23	45	50	56	55	61	68	107

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Flow Record for Homosassa section 7.4

- Gages 678 and 688 combined, no missing data infilled.
- Impacts scaled

Gage	Approved Records	Common Joint	Total Left	Multiplier
USGS Homosassa Springs at Homosassa Springs, FL gage (No. 02310678)	1996-10-15 to 2018-10-01	7996	8305	369
USGS SE Fork Homosassa Spring at Homosassa Springs, FL gage (No. 02310688)	2000-10-01 to 2018-10-15	6103	6589	486
Combined	2000-10-01 to 2018-10-01	5850	6575	725

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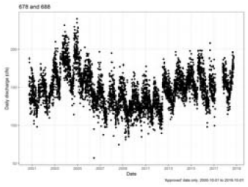
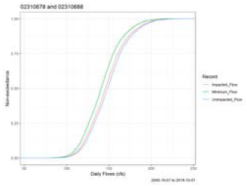
Homosassa Combined Flows



13

Homosassa Combined Flow Duration



14

Homosassa Flow Statistics

Record	min	10th	25th	mean	median	75th	90th	max
Unimpacted	58	121	133	149	148	163	180	243
Impacted	57	119	131	147	146	161	177	240
Minimum	55	115	126	142	141	155	171	231

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Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems

WEDNESDAY, MAY 29, 2019
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The teleconference was held from approximately 1 PM to 3 PM on May 29, 2019. Panel participants included the Panel Chair, Steve Peene and Panelists, Adam Munson and Dann Yobbi. District participants included: XinJian Chen, Chief Professional Engineer; Gabe Herrick, Senior Environmental Scientist; and Sky Notestein, Springs & Environmental Flows Manager. One stakeholder, Ken Nash acknowledged his participation in the teleconference.

The teleconference was initiated by Gabe Herrick with participant introductions, followed by a brief discussion of changes made in response to the previous May 22 meeting. Gabe Herrick noted that changes to the MFLs documents had been made to move description of flow record creation to Chapter 2 from Chapter 7, and that front matter for water quality appendices had been developed and posted to the web forum. Gabe Herrick also noted that sensitivity analysis to salinity and flow as well as truncation of negative flows in Crab Creek had been performed by XinJian Chen, but that report had not been posted to the web forum yet. XinJian Chen described the major results. Steve Peene asked when that report would be posted, and Gabe Herrick replied that District staff needed to do a final review before posting later that day or early the following day. This ended discussion of item number 2 on the agenda.
w
Steve Peene began the panel discussion by asking if the other panel members had any edits or changes to the May 22, 2019 teleconference summary posted on the webforum. The panel members did not have any edits or changes.

Steve Peene then asked the Peer Review Panel members if the information that was presented by Gabe and Xinjian, and that outlined new data and analyses per the request of the Panel, altered their determinations in Section 2.2. on the responsiveness of the District to their comments. Dann identified that the inclusion of the sensitivity analyses would change some of his determinations based on how the results had been described by Xinjian. Steve Peene then asked Dann Yobi if he would be OK with him editing his responses based on review of the new information. Dann identified that he was OK with Steve Peene editing the responses. It was identified that the panel members needed to review the results and that the final review of the draft reports would identify if Steve Peene accurately captured the other Panel members review of the data.

Steve Peene then asked if the Panel members thought some edits to the Section 2.1 write up and the Executive Summary needed to be made based on the results presented by Xinjian on the sensitivity of the upstream salinity boundary conditions. It was decided that Steve Peene would make edits to Section 2.1 and the Executive Summary and that Dann and Adam would review those edits after the full draft reports were posted. Steve Peene also asked Adam Munson if he felt that the District had addressed his issues relative to the Biological Community Assessment section of 2.1. Adam identified that the District had addressed his issues. Steve Peene then asked if there were any other outstanding issues in Section 2.1 that needed to be addressed. The Panel did not have any others.

Steve Peene then went through each specific question as outlined in Section 3.0 with the panel to determine if there were any specific issues that needed to be called out. None were identified for inclusion into Section 3.0.

Steve Peene then identified the schedule and stated that draft final reports would be posted on 5/31/19. Some discussion occurred relative to the fact that 5/31/19 was supposed to be the date for submittal of the finalized reports. The Panel members identified that time was needed to review the new information provided and it would not be possible to finalize the reports by 5/31/19. District staff identified that time would be allowed for the panel members to review the new information and to do a final edit of the draft final reports after posting on 5/31/19.

Before ending the teleconference, Gabe Herrick offered any participating stakeholders the opportunity to provide public comment on the peer review. One stakeholder, Ken Nash discussed assessment of sensitivity and uncertainty, water budget with regard to evapotranspiration, estimated withdrawals, the importance of uncertainty, population growth projections compared with past rates of growth, and the importance of pulse events such as storms.

Following these comments, the meeting was adjourned.

Meeting Agenda

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Peer Review Meeting May 22, 2019

1

Schedule

Event/Item	Start	End
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~~Teleconference, 2:30 - 5:30 pm~~ Teleconference, 9:00 am- 12:00 pm Teleconference, 1:00 - 4:00 pm	~~5/13/2019~~ 5/22/2019 5/29/2019	~~5/13/2019~~ 5/22/2019 5/29/2019
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Panelists provide as-needed services (e.g., consultation, additional review, Governing Board presentation)	6/01/2019	12/31/2019

2

Chassahowitzka and Homosassa MFLs flow records

3

Differences in Flow Records

Record	Missing Dates	Impacts	Inputs
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WQ	Filled	Scaled	Gage(s) only
MFL	Not filled	Scaled	Gage(s) only

4

Hydrodynamic model (LAMFE)

- Period of Record: October 11, 2007 through February 15, 2018
- It is estimated that the existing withdrawal causes about 1.4% reduction of SGDs in Chassahowitzka. As such, the BSL is obtained by dividing the existing SGDs by 0.986. (no gradual ramping)
- Flows at main (02310650) gage are supplemented with additional flows which are proportions of gaged flows.
- See section 4.1 of revised Hydrodynamic modeling report.
- Appendix H plots flows, salinity, temperature at all SGD inputs.
- Chapter 3, p.24 details flow fractions at input locations

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- A complete record is needed without missing days
- Described in section 3.5.1
- Index velocity and regression data used
- Missing data filled in with linear regression between gaged flows and water levels in Weeki Wachee well and replacement well
- Further missing data filled in with linear interpolation
- Impacts scaled according to dates

6

Impact-Date Scaling

Starting Date	Ending Date	Chass Impact	Homosassa Impact
Jan 1, 1975	Jan 1, 2005	0 to 1.0%	0 to 1.1%
Jan 1, 2005	Jan 1, 2010	1.0% to 1.3%	1.1% to 1.8%
Jan 1, 2010	Jan 1, 2015	1.3% to 1.4%	1.8% to 1.9%
Jan 1, 2015	Latest approved	1.4%	1.9%

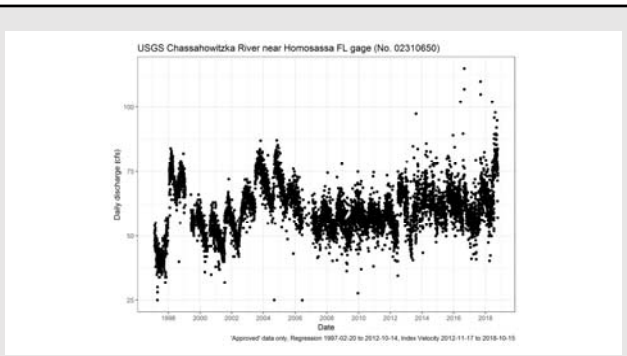
Year	Chass Impact	Hom Impact
2005	1.0%	1.1
2010	1.3%	1.8
2015	1.4%	1.9

7

Flow Record for Chass section 7.4

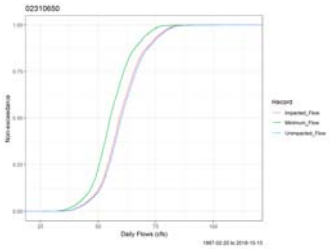
- USGS Chassahowitzka River near Homosassa, FL gage (No. 02310650)
- Regression and Index velocity
- The combined record consists of 6912 observations over 7908 days from 1997-02-20 to 2018-10-15.
- Missing dates were not in-filled with data from other sources or interpolation between dates.
- Impacts scaled according to dates

8



9

Chassahowitzka Flow Duration



10

Chassahowitzka Flow Statistics

Record	min	10th	25th	mean	median	75th	90th	max
Unimpacted	25	49	55	61	60	66	73	117
Impacted	25	49	54	60	59	66	73	115
Minimum	23	45	50	56	55	61	68	107

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Flow Record for Homosassa section 7.4

- Gages 678 and 688 combined, no missing data infilled.
- Impacts scaled

Gage	Period of Record	Observations	Total Days	Missing days
USGS Homosassa Springs at Homosassa Springs, FL gage (No. 02310678)	1995-10-18 to 2018-10-01	7996	8385	389
USGS SE Fork Homosassa Spring at Homosassa Springs, FL gage (No. 02310688)	2000-10-01 to 2018-10-15	6103	6589	486
Combined	2000-10-01 to 2018-10-01	5850	6575	725

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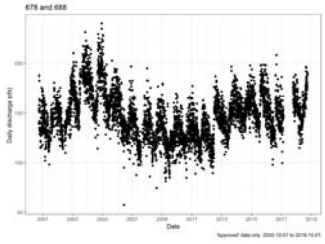
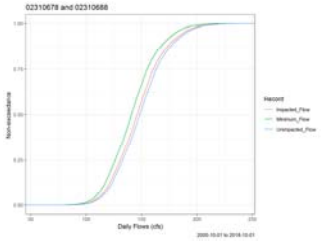
Homosassa Combined Flows



13

Homosassa Combined Flow Duration



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Homosassa Flow Statistics

Record	min	10th	25th	mean	median	75th	90th	max
Unimpacted	58	121	133	149	148	163	180	243
Impacted	57	119	131	147	146	161	177	240
Minimum	55	115	126	142	141	155	171	231

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