

**RESPONSE TO STAKEHOLDER COMMENTS
TO THE LOWER SANTA FE AND ICHETUCKNEE RIVERS AND
PRIORITY SPRINGS DRAFT REPORT**

DECEMBER 2020

Prepared for:



Suwannee River Water Management District
9225 County Road 49
Live Oak, Florida 32060

Prepared by:



15711 Mapledale Blvd, Suite B
Tampa, Florida 33624

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1.0 Response to Comments from Alachua County

Response to Comments provided by Chris Bird, Environmental Protection Director, Alachua County, including comments from Dr. Sam Upchurch
February 5, 2020

Alachua County Comments and Responses

1. **County staff echo the Geologist's concerns outlined in the peer review report and would like to reiterate the limitations of the water use data which is at the core of the draft MFL. Appendix C, Part 1 (Water Use Hindcasting) outlines the water use data but neglects to compensate for known insufficiencies in existing water use datasets. For example, landscape irrigation wells are not included in the water use data. Highlighting the existing knowledge gap, the USGS recognized in their 2014 report, "Water Withdrawals, Use and Trends in Florida, 2010" that a possible factor in the decreasing public supply per capita use could be a shift by commercial and residential public supply customers to other water sources such as irrigation wells that are not accounted for in water use datasets. In addition to the lack of clear data on irrigation wells, domestic self-supply water use is currently estimated which inherently leaves uncertainty in the use data particularly in rural areas where domestic self-supply is a primary source. The USGS has been seeking funding to verify and improve this important data set for rural areas such as the Santa Fe River Basin.**

Response:

The data assessed and assembled in Appendix C of the report are the best information available for the current effort. At the same time, it is recognized that the requirement to establish MFLs is a statutory imperative – using the best available information. As discussed in various responses to comments the District intends to continue the implementation of adaptive management in MFLs, including water use data. The District recognizes that the available water use information can and should be improved over time.

2. **Overwhelming scientific evidence makes it clear that climate change is a critical driving factor that must be included in modeling and planning efforts. While there is a growing body of exhaustive climate change data and research, there continues to be a high degree of uncertainty with the datasets and methodologies in making assessments at the regional, basin-level, and local scales. This glaring lack in climate modeling and planning at these localized scales makes it imperative to err on the side of caution and to apply the Precautionary Principle when setting the MFLs.**

Response:

Regarding the reference to “Precautionary Principle”, it is unclear what should be applied when setting the MFLs. Climate change is discussed in some detail in the Peer Review Panel

(PRP) Resolution document, and language is added to the Final MFL report. Although the recommended action due to climate change is not considered applicable relative to evaluating an allowable change in hydrology caused by withdrawals, climate change is an important water management variable for overall District planning.

- 3. Finally, County staff question the assumption that a 15% harm or reduction to the Water Resource Values is an acceptable threshold for adequately protecting the resources. County staff request a rigorous analysis and critique of this paradigm and the baseline from which it is calculated. County staff are concerned that the methods used indicate that more water is available while, insufficiencies in datasets and methodologies have created margins of error that may be greater than actual available water.**

Response:

The 15% threshold is discussed in some detail in the PRP Resolution document and language is added to the Final MFL report. The 15% time and area thresholds were used because they were utilized and acknowledged as part of the 2013 report and rule, are accepted as preventing significant harm, and by far the most widely used threshold metric for setting MFLs for Florida rivers.

Regarding the baseline (RTF flow) - The critical issue and difference between the 2013 and the 2019 reports is the implicit recognition of the RTF flow as a baseline condition in the 2019 MFLs re-evaluation report rather than the pre-1991 record as in the initial 2013 MFLs assessment and report. The NFSEG model results, with incorporated groundwater withdrawal data, defines both the baseline condition and allows an assessment of the impact of withdrawals. This approach is consistent with other Water Management Districts. The development and use of the NFSEG model for the re-evaluation of the LSFI MFLs was a necessary and primary objective of the re-evaluation pursuant to the Final Order Findings of Fact and Conclusions of Law Pursuant to Rule 62-42.300(1)(e), F.A.C.

“Upon completion of the North Florida Southeast Georgia Regional Groundwater Flow Model currently under development, the Department, in coordination with the Suwannee River Water Management District and the St. Johns River Water Management District, shall re-evaluate the Minimum Flows and Levels and the present status of the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs pursuant to Section 373.0421(3), F.S., using the best available scientific or technical data, methodologies, and models.”

- 4. There has been no mention of a Recovery Plan that outlines measures to decrease groundwater pumping via regulatory and educational methods. The 2014 Recovery Strategy for the Lower Santa Fe River Basin should be strengthened and updated as part of the MFL process.**

Response:

Please see response to Dr. Upchurch’s Comment 18.

Dr. Sam Upchurch Comments and Responses

A. Overall Technical/Scientific Approach

- 1. The basis document is weak in terms of setting the hydrogeological setting and spring functions. It is much better in terms of the biological/ecological/habitat discussions.**

Response:

It was not the District's objective or requirement to revisit background information and all methods that were deliberated and defended in the previous review and hearing process, and resulted in the current MFL Rule 62-42.300, F.A.C. Information sufficient to develop an MFL was presented and discussed. Re-evaluation objectives are discussed under Comment No. 13.

- 2. HEC-RAS modeling appears to be excellent and the details are well developed in the appendix.**

Response:

Thank you for your comment.

- 3. Statistical methods used to fill data gaps in the stream-flow time series are widely used and considered to meet industry standards. However, discussions of "goodness of fit" and uncertainty were not presented in the basis document. These discussions may be in the appendix.**

Response.

Additional information is provided in the Peer Review Panel (PRP) Resolution document and in the final Minimum Flows and Minimum Water Levels Re-evaluation for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs report regarding goodness of fit and uncertainty.

- 4. Use of SEFA to establish WRV thresholds is an advancement over PHABSIM. However, the appendix discussing the methods in detail is weak and does not provide confidence to the reader and water manager in the method. The discussion in the basis document should include considerations of applicability to the LSFR and IR, uncertainties, and improvements over traditional methods, such as PHABSIM.**

Response:

SEFA is primarily an updated interface to various modeling tools, including PHABSIM. PHABSIM is the model used for the instream analyses and language was added to the final LSFI MFL document to clarify. SEFA is discussed in detail in cited documentation.

Additional information is provided in the PRP Resolution document in response to Dunn Comment No. 5.14. Authors have discussed with the SEFA authors, and it was agreed that 15% is an appropriate threshold criterion for the change in Area Weighted Suitability (AWS).

- 5. WRV discussions are good, but some of the threshold values are based on personal communications or presentations at technical meetings. If possible, peer-reviewed thresholds should be utilized. If the only authoritative threshold source is a personal communication or “gray literature”, any uncertainty should be revealed.**

Response:

Peer-review thresholds were utilized when available. Otherwise, recognized experts with local knowledge on a subject (e.g., USGS’s Michael Randall regarding Gulf sturgeon) were consulted.

- 6. I find the single value MFL based on median RTF flow to be problematic. It would be preferred to see a flow regime specified in the MFL based on multiple WRV thresholds. The single value method that relies upon maintenance of the shape of the flow-duration curve does not allow for permitting exceptions that might make water available under certain circumstances, such as “scalping” of peak flows or permitting of base flow from a spring, both of which would alter the shape of the flow-duration curve and a deviation of the median flow.**

Response:

For this MFL re-evaluation, the most restrictive WRV metric was used to define a hydrologic shift from RTF flows. This ensures that other evaluated WRVs associated with greater or lesser flows are protected from significant harm.

For a MFL based on multiple values, greater withdrawals may be available at greater flows, and more limited withdrawals would be available at lower flows. However, by using the single value MFL approach, some surface water may still be available under higher flow conditions. Applications for renewed, modified, or new water use will continue to be reviewed for potential impacts to hydrology and other permit-review criteria pursuant to rules such as 40B-2, F.A.C.

- 7. The basis document concludes that the priority springs are protected by the riverine MFLs. This conclusion is problematic given the relatively small contributions of individual springs to the RTF and current flow patterns. In my opinion, the priority springs are not adequately protected by the proposed MFLs.**

Response:

Existing spring-specific data are still insufficient to develop reliable spring flow records or associations between flow and potential spring WRVs. Purposeful data collection efforts and studies are underway to develop more robust datasets that are specific to WRVs of concern,

including a research effort with the University of Florida intended to develop spring-specific WRVs.

The District asserts that associating Priority Springs with MFLs at their respective downstream river gages is a reasonable approach to prevent significant harm to the springs given the best information available. This is a key reason for proposing an MFL compliance point at the US441 gage where flow under low flow conditions is concordant with total spring flow. There also is limited means of reliably determining compliance at individual low flow springs by accurate, continuous-flow monitoring methods, contrary to the flow at the US441 gage.

B. Quality of the Hydrogeologic, Hydrologic, and Biologic Data

- 8. Little hydrogeological data are presented in the basis document or appendices. The best analyses of hydrologic data are within the appendix dealing with HEC-RAS modeling. Processes used to fill data gaps are poorly described and uncertainties are not discussed. Understanding of the functions of karst, especially the Cody Scarp and springs, is not well demonstrated.**

Response:

See responses to Comments No. 1 and 13 regarding report objectives. Additional information on the goodness of fit and uncertainty in gap filling is provided in the PRP Resolution document and the Final MFL report. The District disagrees with the assertion that little hydrologic data are presented in the basis document. Chapter 2 presents flow, rainfall, groundwater level and temperature data to give the reader a sense of the hydrologic setting. Yield information also is presented to show the influence of baseflow at the Fort White gage. Additional trend information was added in the final LSFI MFL report. The information is more than adequate to develop an MFL.

Additional information regarding the functions of karst and the Cody Scarp, and its influence on the LSFI hydrology has been added to the final MFL document; however, the District has noted that the information has no impact on the MFL.

- 9. Hydrological data are variable in quality and quantity. The methods used to fill data gaps have been discussed above. Gages selected for MFL development are appropriate. Olustee Creek is within the LSFR drainage basin and was not adequately discussed.**

Response:

Olustee Creek is not listed on the District's MFLs Priority List, and it is unclear what additional information is warranted to make it "adequately discussed". Other than as a tributary to the Santa Fe River, Olustee Creek is not an Outstanding Florida Water (OFW), and is essentially above the Cody Scarp. Surface water withdrawals in the Olustee Creek basin are limited at most, and flow at the US441 reference gage includes runoff from the Olustee Creek watershed. Runoff from Olustee Creek was considered in the calibration and parameterization of the HEC-RAS unsteady flow models (see report Appendix E).

10. The biological (ecological and habitat) considerations appear to be properly evaluated in terms of WRVs. However, much literature and ecological/habitat information appears to be missing from the basis document.

Response:

The report is not presented as a comprehensive literature review. Information sufficient to develop an MFL was discussed and, in some cases, discussed in more detail than in the 2013 background document.

C. Were “Best Available” Data Utilized?

11. In terms of hydrological data, yes. See the above discussions of this topic. Literature citations, especially those that characterize the study area and ecological/habitat systems, karst, and uncertainties, are limited in the basis document and appendices.

Response:

The information provided in the initial 2013 MFLs assessment and 2019 re-evaluation are deemed to be sufficient for the intended purpose of setting an MFL.

D. Adequacy of Data Used to Support the Proposed MFLs

12. See the comments above. Data are probably adequate and the best available, but they are not fully validated as being adequate or reliable in the basis document or appendices.

Response:

Additional information is provided in the PRP Resolution document and in the final MFL document, particularly regarding infilling for the US441 gage, a newly proposed reference gage as compared to the initial 2013 MFLs assessment.

E. Ability to Implement and Practicality of the Proposed MFLs

13. I have some concerns with this issue. As stated above, there is likely uncertainty with the RTF method. Therefore, identification of available water, or lack thereof, based on the RTF is problematic. Furthermore, use of a single control point at median flow on the RTF flow-duration curve constrains high and low flow conditions in order to maintain the shape of the flow-duration curve. A set of MFLs that specify a regime of flows and recurrence intervals to protect the WRVs affected by high and low flows is preferable, in my opinion, because it allows permitting related to extreme flows as long as the relevant WRV thresholds are not exceeded.

Response:

The MFL re-evaluation itself is a substantive demonstration of adaptive management in which the original MFLs 2013 analysis was revisited pursuant to the Final Order Findings of Fact and Conclusions of Law Pursuant to Rule 62-42.300(1)(e), F.A.C.:

“Upon completion of the North Florida Southeast Georgia Regional Groundwater Flow Model currently under development, the Department, in coordination with the Suwannee River Water Management District and the St. Johns River Water Management District, shall re-evaluate the Minimum Flows and Levels and the present status of the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs pursuant to Section 373.0421(3), F.S., using the best available scientific or technical data, methodologies, and models.”

The critical issue and difference between the 2013 and the 2019 reports is the implicit recognition of the RTF flow as a baseline condition in the 2019 MFLs re-evaluation and report rather than the pre-1991 record as in the initial 2013 MFLs assessment and report. The NFSEG model results, with incorporated groundwater withdrawal data, defines the baseline condition. This approach is consistent with other Districts. The development and use of NFSEG for the re-evaluation of the LSFI MFLs was a necessary and primary objective of the re-evaluation pursuant to the Final Order Findings of Fact and Conclusions of Law Pursuant to Rule 62-42.300(1)(e), F.A.C.

The single value hydrologic shift from the RTF/baseline condition was selected for the very purpose of facilitating water-resource management and permitting.

Developing critical events as implied by “return intervals” is a substantial change in the approach and not recommended with currently available data, as discussed in more detail in the PRP Resolution document responses.

Also, see response to Comment No. 6.

14. Implementation as alluded to in the basis document would suggest that the flow regime is protected by maintaining the shape of the RTF-derived flow-duration curve and simply allowing a shift in median flow and all other points on the flow-duration curve of a specified amount without changing the recurrence intervals at any shifted flow. This will likely be difficult accomplish and uncertainty based on the RTF will be an issue.

Response:

Plots of flow duration curves for constant withdrawal and constant percent withdrawal are not substantially different when using the proposed MFL flow thresholds. Selecting the most conservative allowable flow reduction affords protection from significant harm for the other WRVs evaluated, and is more practical to implement in water resources management and permitting.

15. The shape of the flow-duration curve will be especially hard to maintain if capturing of peak flows for off-line storage and recovery or if base flow is intercepted by permitted water withdrawals from a spring. It is my opinion that reliance on water managers being able to maintain the shape of a flow-duration curve without written guidance is optimistic.

Response:

Mechanisms currently exist in the water use permitting process to address the potential influence of capturing of peak flows for off-line storage and recovery or spring-specific water withdrawals on the shape of a flow-duration curve. Also, see response to Comment No. 6.

F. Ability of the MFLs to Define a Hydrologic Regime

16. Taken verbatim, the MFLs do not specify a regime. A flow regime is maintained only if the MFL is managed so that the shape of the flow-duration curve never changes.

Response:

As presented in the 2019 draft, the MFL flow regime is the RTF flow minus 103-, 53-, and 10-cfs, at the Lower Santa Fe River (Ft. White, US441) and Ichetucknee River gages, respectively. Using these values, plots of flow duration curves for constant withdrawal and constant percent withdrawal are not substantially different. The reality is that it is difficult to permit (implement) a variable withdrawal for groundwater uses, so the most limiting hydrologic shift of the metrics evaluated was selected.

G. Application of the MFLs to Protection of the WRVs Defined in Chapter 373 F.S.

17. There are concerns about some of the WRV thresholds, as discussed above. Use of SEFA models is appropriate but should be better defended. Reliance on "gray literature" and personal communications to set WRV thresholds should be minimized and justified.

Response:

PHABSIM was the model used in SEFA. The same habitat suitability curves utilized, and peer reviewed in the initial 2013 MFLs assessment were utilized and peer reviewed in the 2019 MFLs re-evaluation.

H. Technical Need for a Recovery Strategy

18. The 2019 basis document indicates that there is less available water available than the 2013 MFL document allowed in the LSFR at the Ft. White gage and the same water availability in the IR. Based on the allowed flow reductions from the new RTF

flow-duration curve, there is water available at both LSFR gages and in the IR (Table 33, 2019 basis document). As a result, there is no indication of the need for a Recovery Plan in the 2019 basis document.

Response:

The 2019 basis document does not address the subject of the current, or projected, amount of water use impact to the water resources. It only describes and defines the MFL. The need for a recovery plan is based on the status of an MFL; that is an evaluation of the withdrawals relative to a “no pumping” scenario, compared to the water available under the MFL without withdrawals. If the water available under the MFL is less than the water being withdrawn, the net availability is negative, and the waterbody is in recovery. Table 33 does not show the status of the MFL at the three gages. A separate status document that will address this subject is being prepared by the District. Again, the MFL document only provides the available water under a no-pumping condition; not the status, and thus does not provide specific insight into the need or lack of need for a recovery/prevention strategy.

19. The lack of need for a Recovery Strategy should be discussed in the 2019 basis document, especially in consideration of the 2013 MFL basis document which found that water in both the LSFR and IR had been over committed and that a Recovery Plan was merited. The development of a Recovery Plan in 2013 was, in part, a result in uncertainties in the MFL and historic flows after removal of permitted uses.

Response:

See response to Comment No. 18.

I. Approach of the MFLs to Natural Stresses, Such as Climate Change and Natural Hydrological Cycles

20. Climate change and hydrologic cycles are mentioned in the basis document, but they are not directly addressed in terms of the MFLs and management of water availability.

Response:

Climate change is discussed in the PRP Resolution document and language is added to the Final MFL report; the MFL was developed to address the prevention of significant harm due to withdrawals per the Statute language.

J. Appropriateness of Statistical Methods and Conclusions

21. The statistical methods are appropriate. There is a need for uncertainty analysis concerning detailed hydrologic data gap filling methods and development of the RTF data.

Response:

Additional information is provided in the PRP Resolution document and the final MFL report.

K. Relationship of the Proposed MFLs to Springs Protection

22. In my opinion, the proposed MFLs do not adequately protect the priority springs.

Response:

The District asserts that the apportioning approach based on the most restrictive hydrologic shift protects the priority springs from significant harm.

L. Relationship of the Proposed MFLs to the Established MFLs for the Upper Santa Fe River

23. The basis document provides guidance for incorporating the USFR MFLs in a general sense. Use of data from the US 441 gage in conjunction with the Worthington Springs MFL will allow for managing flows at the upstream reach of the LSFR.

Response:

Acknowledged. That is the purpose of gap filling and incorporating the US441 gage into the MFL using flow apportionment. It is notable that the USFR MFL defined at the Worthington gage is comparable to an apportionment result as discussed in Section 5.5 of the report.

2.0 Response to Comments from the Florida Springs Institute

Response to Comments provided by Dr. Robert Knight, Executive Director, Florida Springs Institute to Kristine Morris, Florida Department of Environmental Protection, January 24, 2020

- 1. It is also a documented fact that the springs along the Santa Fe River are discharging an annual load of anthropogenic nitrate-nitrogen between 1,000 and 2,000 tons to the Santa Fe River, and ultimately to the Suwannee River and Gulf of Mexico. Your own data published in the 2013 MFL report documented that there is a clear and significant inverse relationship between river flow and nitrate concentrations. To state the obvious, lowered flows exacerbate nutrient pollution in the rivers.**

Response:

The 2013 MFLs report stated that no significant relationship between nitrate and flow in the Ichetucknee River could be established and that, in the Lower Santa Fe River, the relationship between flow and nitrate is complicated, due to both surface water and groundwater contributions to flow. It is indicated in the 2013 report that the relationship between nitrate and spring flows is variable, with some springs having a positive relationship, some having no relationship, and only one (Blue Hole) having a negative relationship.

More recent evaluations of the relationship between nitrate and flow for four springs along the Lower Santa Fe River indicated positive relationships for three of these four springs and no relationship for the fourth (HSW memo to the District dated November 20, 2019). At the Fort White river gage site, there was a strong negative relationship between nitrate and flow; however, there was considerable uncertainty in the relationship at flows of 3,500 cfs or less, near the numeric nutrient criterion of 0.35 mg/L.

While the District concurs that elevated nitrate concentrations are an important water quality concern for springs and spring-fed rivers, due to the lack of a clear relationship between nitrate and flow a WRV metric was not developed as part of the MFL re-evaluation.

- 2. Groundwater quantity and quality must be considered together as a holistic system to solve these worsening problems.**

In 2012 DEP adopted a basin-wide water quality action plan for the Santa Fe and Ichetucknee rivers. That plan required a 50 percent reduction in nitrogen fertilizer loading for the 1,800 square mile Santa Fe Springshed that feeds groundwater to more than fifty springs that flow into these rivers.

In 2014 the Suwannee and St. Johns Water Management Districts completed a multi-year study of the Santa Fe and Ichetucknee rivers and concluded that both waterways were beyond the point of significant harm due to excessive groundwater pumping.

In 2015 the Florida Department of Environmental Protection in association with the Districts, implemented a prevention and recovery strategy to comply with the Santa Fe and Ichetucknee minimum flow requirements.

In 2018 DEP revised the Santa Fe Basin Management Action Plan in the face of the 2012 plan utterly failing to reverse continuing water quality degradation.

And now, at the end of 2019 and early 2020 the DEP and the Districts are back, revising their failed 2015 MFLs.

Response:

Thank you for your comment. The District concurs that quantity and quality should be considered as components of a holistic system. Both water quantity and quality are key elements in the District's Strategic Plan and are components of Water Management Districts' core areas of responsibility. However, separate District and State programs currently exist for water supply planning and water quality protection. While it is the District's goal to prevent significant harm due to water withdrawals and meet numeric nutrient criteria for waterbodies, these efforts may not overlap within the same technical evaluations or planning reports. Additionally, the re-evaluation of both water quality restoration plans and MFLs do not necessarily indicate a failure by DEP or the District but are seen as an important part of an adaptive management strategy to ensure that they use the best available data and reduce uncertainty over time.

3. In the Santa Fe Springshed 2,100 new well permits were issued since 2015 when the Districts and DEP assured the public that we had entered a "prevention and recovery" period for these water bodies. Every well permit that allows more groundwater to be withdrawn from the aquifer also facilitates the application of more fertilizer to ag fields or lawns. The resulting depletion and pollution of our region's groundwater is a double blow to the health of our drinking water and local springs.

Response:

Thank you for your comment. The 2015 LSFI MFL evaluation found the Santa Fe and Ichetucknee Rivers to be in recovery, meaning water levels were below the established MFL threshold and that less consumptive water use (pumping) was needed to maintain healthy river and springs ecosystems. As defined in rule, the 2014 recovery strategy stated that the regulatory measures preceded the development of longer-term recovery measures and:

- existing permits could continue,
- renewals that cause an impact required a five-year permit duration condition and no new impacts were allowed,
- and new permits may be issued if they do not cause an impact at reference stations along the river or at springs.

Applicants may receive a 20-year permit only when their entire impact is offset. Any permits that were issued were in compliance with the adopted Recovery Strategy.

New well permits issued since 2015 primarily consist of domestic self-supply wells. The District is statutorily prevented from regulating domestic self-supply water use according to 373.219, F.S.

- 4. Analysis of the actual USGS discharge data for the MFL stations was summarized and reported to District staff in August 2018 (see attached). Median flows in the Santa Fe River at the US 47 Gauge are down 28 percent for the period 2000 to 2017 compared to flows recorded at that location before 2000. Median flows averaged over the past two decades are only about 800 cfs compared to the District's recommended MFL median flow of 1,167 cfs. The new MFL and the old MFL are not being achieved.**

Response:

The 2019 MFL re-evaluation report does not address the subject of the current, or projected, amount of water use impact to the water resources. It only describes and defines the MFL. A separate status document is being prepared by the District that will address whether the MFLs are being met. Again, the MFL document only provides the available water under a no-pumping condition; not the status, and thus does not provide specific insight into whether the MFL is currently being achieved.

- 5. The fact that the District's draft MFL authorizes a flow reduction of 114 cfs (74 MGD) while actual, multi-decadal flows are already 509 cfs (329 MGD) lower than historic flows, proves that this new MFL is already violated and not in the public's legitimate best interests. FSI recommends that this new MFL mandate the recovery of 395 cfs (255 MGD) (the difference between 509 and 114 cfs) of lost flows by substantially reducing all existing water use permits in the region.**

Large springs that were never observed to stop flowing in the past, have stopped flowing multiple times during recent drought periods. Springs that were translucent-blue 25 years ago are now green-brown and most of their plants and fish are gone. Rivers and springs that were pristine as recently as 40 to 50 years ago are now terribly polluted and depleted as a result of poorly regulated human activities.

Response:

The effect of groundwater withdrawals on flows in the Lower Santa Fe and Ichetucknee Rivers is explicitly considered by the overall approach to the 2019 MFLs re-evaluation. The District does not agree with the implication that groundwater pumping alone is responsible for low flows. Other factors such as land use changes over the last 90 years (period of record), climatic changes (warming in particular), and the hydrogeologic intricacies of the region also play meaningful roles. The District concurs with the comment by Dr. Sam Upchurch provided in the Alachua County comments that "Overwhelming scientific evidence makes it clear that climate change is a critical driving factor". Climate change and corresponding rainfall variation is

discussed in some detail in the PRP Resolution document and language is added to the Final MFL report.

Also, please see response to Comment No. 4.

- 6. The science is clear – the aesthetic and economic health of our local rivers and springs is being lost as groundwater withdrawals and fertilizer inputs increase, one gallon and one pound at a time. The springs that provide the base flow of the Santa Fe and Ichetucknee Rivers are suffering a “death by a thousand cuts”.**

Response:

Thank you for your comment.

- 7. For the health and vitality of our region’s priceless springs, we recommend that no new wells be permitted, and no expired permits be re-issued until a greater volume of existing groundwater use is eliminated from those existing permits. We respectfully request that DEP use its authority to expeditiously restore the Santa Fe and Ichetucknee Rivers and Springs.**

Response:

Thank you for your comment. For information regarding permit issuance, please see [40B-2, F.A.C.](#)

3.0 Response to Comments from the Florida Springs Council

Response to Comments provided from Mr. Ryan Smart, Executive Director of the Florida Springs Council to Kristine Morris, Florida Department of Environmental Protection, February 5, 2020

..."Based on the above, we believe that the draft MFL fails to meet the statutory requirements under 373.042, is not protective of the Santa Fe and Ichetucknee Rivers, and will result in significant harm to Outstanding Florida Springs.

In November of 2013, the SRWMD adopted an interim MFL for the Lower Santa Fe River, Ichetucknee River, and Priority Springs. As part of the MFL, the SRWMD found that significant harm to water resource values was occurring, requiring the development of a recovery plan. Despite the adoption of a document the District classifies as a recovery plan, approximately 2,100 new well permits were issued within the springshed since it went into effect in 2015. The Florida Springs Institute's analysis of USGS discharge data, the same data utilized by SRWMD to develop the draft MFL, found a 28 percent decrease in flow from 2000 to 2017 at the US 47 gauge, when compared to pre-2000 data. These data indicate that the river systems are already experiencing significant harm from decreased flows. The continuing downward trend in flows (when adjusted for rainfall) further indicates that the ""recovery plan"" has failed to yield restoration benefits. For these reasons, we challenge the draft MFL report's assertion that additional flow reductions should or can be permitted"

Of greatest concern, is that the proposed MFL is not designed to protect Outstanding Florida Springs. The Florida Springs and Aquifer Protection Act (FSAPA), signed into law in 2016, requires the adoption of MFLs for 30 Outstanding Florida Springs, including several within the Santa Fe River basin. However, the draft MFL only sets minimum flow levels in the rivers, not in the Outstanding Florida Springs. As Mr. Upchurch points out in his peer review, "The basis document concludes that the priority springs are protected by the riverine MFLs. This conclusion is problematic given the relatively small contribution of individual springs..." He goes on to say that the draft MFL is "weak" and "shows little understanding of specific springs and resurgences." Mr. Upchurch concludes "the proposed riverine MFLs do not adequately protect the springs."

The proposed MFL also appears to be in contradiction with the very intent of the FSAPA. Section 373.801(3)(b) states, "Many of this state's springs are demonstrating signs of significant ecological imbalance, increased nutrient loading, and declining flow. Without effective remedial action, further declines in water quality and water quantity may occur." Section 373.901(4) clarifies that such "action is urgently needed." In fact, the Legislature found the need for more protective MFLs so urgent that it "authorized and found that all conditions are met, to use emergency rulemaking provisions" to adopt MFLs (373.042(2)(c)). Considering this legislation, the draft MFL's proposal for a less protective rule and increased pumping, which will inevitably harm already diminished Outstanding Florida Springs, is negligent.

Response:

The District strongly disagrees with the statement that the proposed MFL is not designed to protect Outstanding Florida Springs from significant harm. The proposed MFL, which allows for less than 10% change in flow, would be considered 'a high level of ecological protection' according to a case study review by The Nature Conservancy (Richter, et al. 2011)¹. Also, as of December 2020, 326.7 riverine miles have an adopted MFL, not including the mileage of tributaries to major rivers. In addition, 43 springs are covered by MFLs.

As stated in the draft 2019 LSFI MFL document and in response to comments, there is insufficient information, such as metrics for rule-referenced water resource values, to develop spring specific MFLs, particularly for the low flow springs that have little associated flow data. This is a key reason for proposing an MFL compliance point at the US441 gage where flow under low flow conditions is concordant with total spring flow. There also is limited means of reliably determining compliance at individual low flow springs by accurate, continuous-flow monitoring methods, contrary to the flow at the US441 gage.

¹ Richter B.D., Davis, M.M., Apse C., and Konrad, C. 2011. A presumptive standard for environmental flow protection. *River Research and Applications*. Vol. 28. No. 8. pp 1312-1321.

4.0 Response to Comments from the Ichetucknee Alliance

Response to Comments provided from Mr. John Jopling, President, Ichetucknee Alliance, Inc to SRWMD, March 12, 2020

The document fails to meet legal requirements, is not protective, and will result in significant harm. The Alliance believes that the draft MFL fails to meet the statutory requirements under 373.042, is not protective of the Ichetucknee River, and will result in significant harm to the Ichetucknee’s Outstanding Florida Springs. Per the Florida Springs Council’s letter referenced above:

- 1. The document’s MFL proposal is negligent. As cited in comments by the Florida Springs Council (FSC), the draft MFL’s proposal for a less protective rule that enables increased pumping—which will inevitably harm already diminished Outstanding Florida Springs—is negligent.**

Response:

The District disagrees that the document’s MFL proposal is negligent. The draft revised MFL for the Ichetucknee River is more restrictive than the current MFL. At the HWY 27 Near Hildreth, FL gage, the draft revised MFL is a median flow of 346 cfs (2.8% allowable reduction) whereas the current MFL is a median flow of 343 cfs (3% allowable flow reduction).

The 2019 MFL re-evaluation report does not address the subject of the current, or projected, amount of water use impact to the water resources. It only describes and defines the MFL. A separate status document is being prepared by the District that will address whether the MFLs are being met. Again, the MFL document only provides the available water under a no-pumping condition; not the status, and thus does not provide specific insight into whether the MFL is currently being achieved.

- 2. The document could remove an existing protection. Also, per comments by FSC, the Alliance is alarmed that the draft MFL could trigger a provision in 373.805(3) that allows for adoption of the MFL without concurrently adopting a recovery or prevention strategy. We object to the removal of an existing protection for the Outstanding Florida Springs along the Ichetucknee River that would allow additional pumping and result in further degradation of these springs.**

Response:

This is an incorrect assumption. A water body status assessment document that will address the subjects of recovery and prevention is being prepared by the District.

- 3. The document contains a false statement. In regard to Water Resource Value (WRV) 5, Maintenance of Freshwater Storage, the statement on page 57 is false: “While this WRV is considered relevant, it is afforded protection by the permitting process...”. The permitting process is not protecting water security of the Upper Floridan aquifer, per several graphics**

included in the letter from Robert L. Knight of the Florida Springs Institute that was sent to Kristine Papin Morris of DEP on January 24, 2020: “Increased Groundwater Pumping Lowers Aquifer Pressure (levels)”; **“Ichetucknee River Flows Are Declining in Spite of Relatively Constant Rainfall”;** **and “Ichetucknee River Rainfall vs. Discharge (1930- 2017)”** **that shows a 21 percent flow reduction (76 cubic feet per second) independent of rainfall. We also refer you to the long-term groundwater level decline demonstrated at the Florida Department of Transportation’s Lake City monitoring well as reported monthly in the hydrologic conditions report issued by the Suwannee River Water Management District (see attached graphic).**

Response:

This WRV refers to the long-term maintenance (i.e. sustainability) of water storage and supply capability of the water body. Establishment of a MFL for a water body implicitly establishes potential availability of that water. The result of the protection of this WRV by MFL establishment is to ensure that, over time, the ability of the water body to serve as a supply source for existing and future legal permitted users is prevented without causing “significant harm” to the water resource or ecology of the area. The assertion that WRV 5 is afforded protection by the permitting process is documented by Klein et. al. (2009)².

The District does not agree with the implication that groundwater pumping alone is responsible for low flows. Other factors such as land use changes over the last 90 years (period of record), climatic changes (warming in particular), and the hydrogeologic intricacies of the region also play meaningful roles. Climate change is discussed in some detail in the Peer Review Panel (PRP) Resolution document, and language is added to the Final MFL report.

4. "The document relies on insufficient data and ignores the Precautionary Principle. The use of insufficient data is troubling, per this statement on pdf page 64 (document page 56) of the Technical Report: “More often, available data are insufficient to quantify the flow characteristics that are protective of a WRV, and assumptions and professional judgment are needed to develop protective criteria.” This is a classic case of how the Florida Department of Environmental Protection and the water management districts should be applying the Precautionary Principle: When in doubt, choose the course of action that causes the least amount of environmental harm until doubt can be resolved"

Response:

In the context of the last sentence in Comment No. 4, selecting the most conservative allowable flow reduction affords protection from significant harm for the other WRVs evaluated and is practical to implement in water resources management and permitting.

² Klein, K.A., Angelo, M.J., and Hamann, R. 2009. Modernizing Water Law: The Example of Florida. Florida Law Review. Vol. 61. No. 3. pp 403-474.

- 5. The document relies on outdated information and ignores the Precautionary Principle. Also on pdf page 64, the Alliance is troubled by this statement: “Although the federally endangered West Indian manatees visit the springs, none of the springs on the LSFR or IR have been identified as significant thermal refugia for manatees (Warm Water Task Force 2004).” Here, a 16-year-old report is driving a decision to ignore manatees when we know that these animals are losing refugia as coastal power plants go offline and as their use of the Ichetucknee appears to be increasing. Additionally, when water levels drop in the Ichetucknee River, manatees are unable to cross the limestone shelf at the river’s confluence with the Santa Fe. This situation at the confluence must be considered in the revised MFL. The situation with manatees is another case in which the Precautionary Principle should be invoked in order to ensure that manatees can continue to gain access to the Ichetucknee.**

Response:

This comment is incorrect. Manatee passage over shoals has been adequately evaluated and described in the 2013 and 2019 reports. Manatee access to the Ichetucknee River is influenced at times by conditions of the Suwannee River which is outside the scope of the LSFI MFLs re-evaluation.

- 6. The document ignores damage to an aesthetic and scenic attribute. In regard to WRV 6, Aesthetic and Scenic Attributes (pdf page 65), there should be acknowledgement that the proliferation of algae on submerged aquatic vegetation and in the Ichetucknee River and springs—a proliferation that has been linked to pollution as well as to loss of flow—is a clear example of aesthetic degradation.**

Response:

The District disagrees with this comment. Submerged aquatic vegetation was specifically linked to aesthetic and scenic attributes (WRV 6) in Table 12 of the 2019 MFL report. Proliferation of algae on submerged aquatic vegetation in the Ichetucknee River was assessed based on threshold flows at which the average velocity decreases below 0.8 ft/s at three stations.

- 7. The water model used in development of the MFL is flawed. The Alliance questions the suitability and reliability of the North Florida-Southeast Georgia (NFSEG) Groundwater Model in areas of karst environments such as those that surround the Ichetucknee.**

Response:

The NFSEG and associated HSPF models have been peer reviewed, and the models are accepted for use in water resource planning as evidenced by the explicit inclusion of NFSEG in Rule 62-42.300(1)(e), F.A.C.

Florida statute requires that the District use the “best information available” when completing MFLs. The NFSEG provides the best information available for the District to evaluate impacts.

- 8. The MFL fails to consider the connections between flow (water quantity) and water quality. The Alliance also believes that the Florida Department of Environmental Protection and the water management districts need to develop a system to link water quality and water quantity in evaluations such as the MFLs, because these two things are interconnected--not separate.**

Response:

Thank you for your comment. The District concurs that quantity and quality should be considered as component of a holistic system. Both water quantity and quality are key elements in the District's Strategic Plan and are components of Water Management Districts' core areas of responsibility. However, separate District and State programs currently exist for water supply planning and water quality protection. While it is the District's goal to prevent significant harm due to water withdrawals and meet numeric nutrient criteria for waterbodies, these efforts may not overlap within the same technical evaluations or planning reports.

5.0 Response to Comments from the Liquid Solutions Group, LLC, representing the North Florida Utility Coordinating Group

Response to Preliminary Review Comments on The Minimum Flows and Levels Re-Evaluation for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Draft Report Released on December 20, 2019

Liquid Solutions Group, LLC January 30, 2020

- 1. Calculation of historical flow for Lower Santa Fe River (LSFR) at US 441 gage. The accuracy of the multiple linear regression (MLR) equation used to estimate flows at US 441 is inadequate for use in this process. The required statistical conditions for use of MLR are not met.**

Response:

The District disagrees with the above statement. Additional information has been provided in the Peer Review Panel (PRP) Resolution document. Briefly, most of the statistical conditions allegedly required for using MLR results are not required for using the predictive equation(s) for predictions (gap filling). Numerous models and modeling approaches were tested, statistical assumptions were evaluated, and marginal improvements were obtained. All the models and modeling approaches tested produced very similar estimates of the median flow at US441– the objective of the modeling used in the final LSFI MFL report application.

- 2. The WRVs used for the US 441 gage are mathematically derived from work related to the Ft. White gage without adequate field work or modeling. The mathematical method used for derivation of a WRV at the US 441 gage is not technically based and inappropriate for application.**

Response:

Please see response to Comment No. 1; the gap filling approach is appropriate and standard hydrological practice. In the final report, only the estimate of the median flow at US441 is used in an apportionment procedure at the median flow.

- 3. Estimates of historical pumping impacts on LSFR. The North Florida Southeast Georgia (NFSEG) groundwater model is poorly calibrated at the US 441 gage leading to inaccurate impact calculations. The NFSEG model shows anomalous impacts at springs along the LSFR which affect the calculation of historical pumping impacts.**

Response:

Impact calculations for the US 441 gage are less than those at the Ft. White gage and exhibit consistent trends. While individual spring flows can be modeled with NFSEG, individual spring impacts were not utilized in the 2019 draft MFL report. The NFSEG model has been peer reviewed and represents the best information available for this system. Subsequent review of

the calibration in the US 441 region indicated that the final model calibration in that area appropriately minimized model error at provided observation points in 2001 and 2009.

4. Proposed allowable change in flow on the Ichetucknee River (IR). The proposed allowable change of 2.8% is out of the typical range for spring MFLs throughout the state of Florida and requires justification

Response:

Both the percent time and SEFA results support the allowable change from the RTF/baseline condition, as does the 2013 MFL report and the current MFL Rule.

5. The 15% change used as a standard to prevent significant harm for WRVs is based on precedent alone and not justified by the data presented in the report.

Response:

The 15% threshold is discussed in detail in the PRP Resolution document and language is added to the final LSFI MFL report. The 15% time and area thresholds were used because they were utilized and acknowledged as part of the 2013 report and rule, are accepted as preventing significant harm, and are the most widely used threshold metric for setting MFLs for Florida rivers.

6. The analyses performed to date do not support the use of the US 441 gage as an MFL location for the LSFR. Neither the accuracy nor precision required for a reliable and technically sufficient MFL can be provided at this location. Until more data is collected, protection of the LSFR should be provided by the downstream gage at Ft. White. Furthermore, as documented herein, additional work and analyses are required in order to justify the use of the proposed IR MFLs.

Response:

The District disagrees on both counts. Numerous data collection efforts and studies are underway as an integral part of the District's ongoing adaptive water resource management to develop more robust datasets in the LSFI basin, particularly for spring-specific WRVs.

Liquid Solutions September 29, 2020

7. Rainfall and LSFR flows do not exhibit long-term statistically significant trends and rainfall is a statistically significant predictor of LSFR flows. The relationship is consistent through time.

Response:

An association between rain and flow ultimately was not used in the 2019 draft MFL re-evaluation, rather the NFSEG model results were used to estimate withdrawal impacts. The NFSEG model results, with incorporated groundwater withdrawal data, defines both the

baseline condition and allows an assessment of the impact of withdrawals. This approach to defining baseline flow is consistent with other Water Management Districts. The development and use of the NFSEG model for the re-evaluation of the LSFI MFLs was a necessary and primary objective of the re-evaluation pursuant to the Final Order Findings of Fact and Conclusions of Law Pursuant to Rule 62-42.300(1)(e), F.A.C:

“Upon completion of the North Florida Southeast Georgia Regional Groundwater Flow Model currently under development, the Department, in coordination with the Suwannee River Water Management District and the St. Johns River Water Management District, shall re-evaluate the Minimum Flows and Levels and the present status of the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs pursuant to Section 373.0421(3), F.S., using the best available scientific or technical data, methodologies, and models.