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# Independent Technical Peer Review for the Draft

## Recommended Minimum Flow for Middle Econfina Creek, Including Gainer Spring, Williford Spring, and Sylvan Spring Groups

Washington and Bay Counties, Florida

**Final Report**

March 24, 2025

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### PRESENTED TO

**Northwest Florida Water  
Management District**  
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# Peer Review for the Recommended Minimum Flow for Middle Econfina Creek including Gainer, Sylvan, and Williford Spring Groups

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## EXECUTIVE SUMMARY

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The Northwest Florida Water Management District, NFWFMD (District), completed the draft technical assessment report for the establishment of Minimum Flow Levels (MFLs) in Middle Econfina Creek including the Gainer, Sylvan, and Williford Spring Groups, located in Washington and Bay counties, Florida (NFWFMD, 2025). The District contracted Tetra Tech, Inc. to assemble subject matter experts in coordination with the District, and to provide scientific peer review of the report. The peer review included an assessment of the data, analyses, models, and methodologies employed by the District in determining the proposed minimum spring flows as presented in the MFL technical assessment report and its associated appendices.

The District's approach toward establishing MFLs in the Middle Econfina Creek including the Gainer, Sylvan, and Williford spring groups is that a hydrologic regime exists such that the system's water resource values are protected from significant harm caused from water withdrawals. The approach is based on quantifiable relationships between spring discharge and multiple physical and ecological features related to specific water resource values (WRVs).

Tetra Tech Inc, in coordination with the District, assembled a Peer Review Panel (Panel) consisting of the following subject matter experts with expertise in hydrology, hydrogeology, statistics, numerical modeling, and riverine and aquatic ecology:

- Martin Hamel, Ph.D.: hydrology, aquatic ecology
- Adam Munson, Ph.D, PE.: hydrology, statistics
- Jeremy Wyss: numerical modeling, hydrology

Dr. Rene A. Camacho, PhD, PE, from Tetra Tech served as the chair of the peer review panel. The technical peer review was conducted between February 5 and February 28, 2025. During this time, the Panel chair facilitated communication between the District and the Panel, conveying questions, requests for clarifications and/or comments as they emerged during the review period. On February 28, the Panel chair received the technical peer review comments from the reviewers and compiled and submitted the comments to the District. On March 5, 2025, the District and peer review Panel held a meeting to discuss the comments provided by the Panel. The Panel had the opportunity to present to the District their opinions on the technical aspects of the MFL, indicating adequacy of assumptions, datasets and methods used for the establishment of the MFL. Each one of the peer reviewers had the opportunity to comment, ask questions, and provide suggestions when deemed necessary, to improve the MFL technical report and/or accompanying appendices. The District had the opportunity to respond to reviewers' comments, provide clarifications and identify needed revisions to the MFL technical report and/or accompanying appendices.

This report presents the Panel's main findings resulting from the assessment of data, technical methods, and assumptions presented in the technical report and accompanying appendices for the establishment of MFLs in Middle Econfina Creek.

## Main Peer Review Findings

The peer review panel considered that the report establishing the MFLs for the Middle Econfina Creek including Gainer, Sylvan and Williford Springs Group was in general adequate, used the best available data, and implemented reasonable assumptions and methods consistent with previously approved MFL studies in the state of Florida, and modeling approaches that were in line with current industry practices.

With regards to the technical aspects of the MFL report, the Panel members did not find major issues in the establishment of MFLs in the Middle Econfina Creek, that would likely impact the overall results or interpretation of the results presented by the District. Most of the comments and questions from the Panel could be addressed

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by enhancing the report with additional information about the underlying assumptions or methods, or in limited cases, by incorporating further analyses or justifications for their omission.

The overall approach to the MFL study was reasonable and well supported by evidence of existing uses, and methodological approaches previously used in other MFL studies, even though in some cases limited data seemed to be available to fully characterize the current, relatively young state of the system following Hurricane Michael and the extensive debris-removal efforts to return the system to more stable conditions. The current state of the system, however, is expected to remain largely unchanged within the planning period. The Panel found appropriate and of high relevance the adaptive management approach proposed for the system which considers continued hydrologic data collection efforts, habitat evolution monitoring, periodical evaluations to check the status of the creek and springs flows in relation to the MFL, and re-evaluations, if needed, of the MFL.

The main comment from the Panel potentially requiring additional analyses in the MFL report was related to the list of species considered for the System for Environmental Flow Analysis (SEFA) modeling. Dr. Hamel and Dr. Munson indicated that the SEFA modeling was missing information related to habitat requirements for the Oval Pigtoe and Gulf Moccasinshell which are the two listed species present in the Middle Econfina Creek. They recommended that the District, in the absence of specific Habitat Suitability Curves (HSC) for these mussel species, consider using other available HSC—even generic ones—for benthic invertebrates. These alternative HSC have been used in other Minimum Flows and Levels (MFL) studies and could provide insight into potential habitat changes for the benthic species of greatest conservation concern. The reviewers noted that the current number of HSCs implemented in the SEFA modeling was likely protective of the mussel species and did not expect the additional analyses to change the MFL results. They also indicated that incorporating the SEFA analyses related to the benthic invertebrate habitats would strengthen the MFL study.

Other Panel comments related to the technical details of the MFL report are elaborated in this report. The full list of comments provided by the reviewers is presented in **Appendix A** through **Appendix C**.

# Peer Review for the Recommended Minimum Flow for Middle Econfina Creek including Gainer, Sylvan, and Williford Spring Groups

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- Appendix A: Peer Review Comment Form: Dr. Adam Munson
- Appendix B: Peer Review Comment Form: Dr. Martin Hamel
- Appendix C: Peer Review Comment Form: Mr. Jeremy Wyss

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## ACRONYMS/ABBREVIATIONS

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Acronyms/Abbreviations	Definition
AMO	Atlantic Multidecadal Oscillation
AUC	Area Under the Curve
DEP	Florida Department of Environmental Protection
District	Northwest Florida Water Management District
FAC	Florida Administration Code
F.S.	Florida Statutes
IWUP	Individual Water Use Permits
MFLs	Minimum Flows and Levels
NOAA	National Oceanic and Atmospheric Administration
NFWMD	Northwest Florida Water Management District
SWFWMD	Southwest Florida Water Management District
SRWMD	Suwannee River Water Management District
USF	University of South Florida
USGS	United States Geological Survey
WRV	Water Resources Values

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

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The Northwest Florida Water Management District (District) completed the draft technical assessment report for the establishment of Minimum Flow Levels (MFLs) in Middle Econfina Creek including the Gainer, Sylvan, and Williford spring groups, located in Washington and Bay counties, Florida (NFWFMD, 2025). The District contracted Tetra Tech, Inc. to assemble subject matter experts in coordination with the District, and to provide scientific peer review of the report. The peer review included an assessment of the data, analyses, models, and methodologies employed by the District in determining the proposed minimum spring flows as presented in the MFL technical assessment report and its associated appendices.

The District is mandated by the Florida Statutes (F.S.) to establish minimum flows and levels (MFLs) for priority surface waters and aquifers within its boundaries for the purpose of protecting the water resources and ecology of the aquatic ecosystems from “significant harm” (F.S. §373.042, 1972 as amended). The District is required to adopt minimum flows for Outstanding Florida Springs (including the Gainer Spring Group) no later than July 1, 2026.

Under the statutes, MFLs are defined as follows:

- A minimum flow is the flow of a watercourse below which further water withdrawals will cause significant harm to the water resources or ecology of the area.
- A minimum level is the level of water in an aquifer or surface water body at which further water withdrawals will cause significant harm to the water resources of the area.

The statutes require the District to develop a MFL Priority List which provides a list of priority water bodies for which MFLs are currently or projected to be worked on in the near future. These MFL Priority Lists are submitted to and approved by DEP on an annual basis. The NFWFMD is committed to voluntarily submit MFL technical assessments for independent scientific peer review.

The Florida Statutes also provide for the MFLs to be established using the “*best available information*,” for the MFLs “*to reflect seasonal variations*,” and for the District’s Governing Board, at its discretion, to provide for “*the protection of non-consumptive uses*.” In addition, F.S. §373.0421 states that the District’s Governing Board “*shall consider changes and structural alterations to watersheds, surface waters and aquifers, and the effects such changes or alterations have had, and the constraints such changes or alterations have placed on the hydrology of the affected watershed, surface water, or aquifer....*”

The State Water Resources Implementation Rule (Florida Administrative Code [F.A.C.] Chapter 62-40.473) contains additional guidance for the establishment of MFLs, providing that “...consideration shall be given to the protection of water resources, natural seasonal fluctuations, in water flows or levels, and Water Resources Values (WRVs) associated with coastal, estuarine, aquatic and wetlands ecology, including:

1. Recreation in and on the water;
2. Fish and wildlife habitats and the passage of fish;
3. Estuarine resources;
4. Transfer of detrital material;
5. Maintenance of freshwater storage and supply;
6. Aesthetic and scenic attributes;

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7. Filtration and absorption of nutrients and other pollutants;
8. Sediment loads;
9. Water quality; and
10. Navigation.

### 1.2 DEFINITION OF PEER REVIEW PANEL

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Tetra Tech Inc, in coordination with the District, assembled a Peer Review Panel (Panel) consisting of the following subject matter experts with expertise in hydrology, hydrogeology, statistics, modeling, and riverine and aquatic ecology:

- Martin Hamel, Ph.D.: hydrology, aquatic ecology
- Adam Munson, Ph.D, PE.: hydrology, statistics
- Jeremy Wyss: numerical modeling, hydrology

Rene A. Camacho, PhD, PE, from Tetra Tech served as the chair of the peer review panel. The Panel prepared this report to document the comments, questions, and recommendations resulting from their review of the draft technical assessment report for establishing Minimum Flow and Minimum Water Levels (MFLs) in Middle Econfina Creek, including the Gainer, Sylvan, and Williford spring groups in Bay and Washington Counties, Florida (NFWFMD, 2025). The following sections summarize the Panel's objectives and constraints considered during the scientific peer review, as well as the main findings resulting from the assessment of data, technical methods, and assumptions presented in the report and accompanying appendices for the establishment of MFLs in Middle Econfina Creek.

### 1.3 PEER REVIEW PANEL OBJECTIVES

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The District provided the Panel with the following charge:

- Review the draft MFL technical assessment report and appendices which summarize the data and methods used to develop the proposed minimum flow criteria for the Gainer, Sylvan, and Williford Spring Groups.
- Evaluate the data, analyses, models, and methodologies used by the District to determine the proposed minimum flow(s).
- Complete the following tasks and include responses or comments on each task in a written report provided to the District.
- Responses and comments reflecting views shared by the peer reviewers will be presented collectively in a written report compiled by the Chairperson (Dr. Rene Camacho-Rincon).
- Disagreements, if any, between peer reviewers concerning responses and comments on each task will also be identified.
- In their review, per reviewers will use the Peer Review Comment Forms provided by the District, to provide responses.

The key criteria that the Panel should consider when assessing an MFL technical assessment include:

1. Supporting Data and Information: Review the data and information that supports the conclusions made in the report to determine:

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- a. The data and information used was properly collected;
- b. Reasonable quality assurance assessments were performed on the data and information;
- c. Exclusion of available data from the analyses was justified; and
- d. The data used was the best information available.

Note: The reviewers are not to provide independent review of standard operating procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the U.S. Geological Survey and the District's hydrologic monitoring network.

2. Technical Assumptions: Review the technical assumptions inherent to the analysis used in the MFL report to determine whether:

- a. The assumptions are clearly stated, reasonable and consistent with the best information available;
- b. Other analyses that would require fewer assumptions but provide comparable or better results are available.

3. Procedures and Analyses: Review the procedures and analyses used in the MFL 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. The limitations and imprecision in the information were reasonably handled;
- e. The procedures and analyses are repeatable;
- f. Conclusions based on the procedures and analyses are supported by the data.
- g. Determine if the methods used in establishing the MFL are scientifically reasonable. If a proposed method used in the MFL report is not scientifically reasonable, the Panel shall:
  1. List and describe scientific deficiencies and, if possible, describe potential implications of the error associated with the deficiencies;
  2. Determine if any identified deficiencies can be remedied:
    - a. If the identified deficiencies can be remedied, then describe the necessary remedies and if possible, provide an estimate of time and effort required to develop and implement each remedy.
    - b. If the identified deficiencies cannot be remedied, then, if possible, identify one or more alternative methods that are practical, cost-effective, and 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.

## 1.4 PEER REVIEW LIMITATIONS AND CONSTRAINTS

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The Panel was requested to acknowledge that statutory constraints and conditions affect the District's development of MFLs (Sections 373.042 and 373.0421, Florida Statutes and Chapter 62-40.473, Florida Administrative Code). In consequence, review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board were not included in the scope of work. These included:

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;

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2. The definition of what constitutes “significant harm” to the water resources or ecology of the area;
3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and
4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.

## 2.0 PEER REVIEW TIMELINE

On February 5, 2025, the District and peer review Panel held the project kick off meeting. The District presented to the Panel the technical details, including major assumptions, and approaches, implemented for the definition of recommended MFLs for Gainer, Williford, and Sylvan Spring Groups. The District also described the framework for the peer review process, indicating technical expectations and timelines to conduct the peer review.

The technical peer review was conducted between February 5 and February 28, 2025. During this time, the Panel chair facilitated communication between the District and the Panel, conveying questions, requests for clarifications and/or comments as they emerged during the review period. On February 28, the Panel chair received the technical peer review comments from the Panel and compiled and submitted the Panel comments to the District.

On March 5, 2025, the District and peer review Panel held the peer review comments meeting. The Panel had the opportunity to present to the District their opinions on the technical aspects of the MFL, indicating adequacy of assumptions, datasets and methods used for the establishment of the MFL. Each one of the peer reviewers had the opportunity to comment, ask questions, and provide suggestions when deemed necessary, to improve the MFL technical report and/or accompanying appendices. The District had the opportunity to respond to reviewer’s comments, provide clarifications and identify needed revisions to the MFL technical report and/or accompanying appendices. The following sections provide a summary of main findings and comments from the peer review of the recommended minimum flows for Gainer, Sylvan, and Williford springs group.

## 3.0 SUMMARY OF MAIN PEER REVIEW COMMENTS

The peer review panel considered that the report establishing the MFLs for the Middle Econfina Creek including Gainer, Sylvan, and Williford Springs Groups was in general adequate, used the best available data, and implemented reasonable assumptions and methods consistent with previously approved MFL studies in the state of Florida, and modeling approaches that were in line with current industry practices.

During the presentation of peer review comments to the District, reviewers commended the District’s efforts in completing the MFL study despite significant disruptions in the system over the past decade. In particular, they acknowledged the impact of Hurricane Michael, which caused severe damage and significantly altered the system. However, they also noted that, following the extensive debris-removal efforts, the system is stabilizing and therefore, significant alterations are not expected during the planning period. The Panel found appropriate and of high relevance the adaptive management approach proposed for the system which considers continued hydrologic data collection efforts, habitat evolution monitoring, periodical evaluations to check the status of the creek and springs flows in relation to the MFL, and re-evaluations, if needed, of the MFL.

Dr. Munson expressed that the overall approach to the MFL study was reasonable and well supported by previous MFL studies, even though in some cases limited data seemed to be available to fully characterize the current, relatively young state of the system following Hurricane Michael. The current state of the system, however, is anticipated to remain largely unchanged within the planning period. In Dr. Munson’s opinion, “*the high*

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*degree of public ownership of lands in the contribution area, the lack of foreseeable consumptive uses and the relatively unimpacted nature of the system offer ample evidence that the system is not in recovery and is likely to remain largely unimpacted within the planning period”.*

Finally, Dr. Munson concluded that the recommended MFL of a 9.5% allowable reduction in the long-term average baseline flows for the Middle Econfina Creek is within the range of other MFLs developed for spring-dominated systems where established MFLs have varied between 2.5 and 15% allowable flow reductions. He pointed out that *“The Rainbow River, which shares some similarities with this system, has an allowable flow reduction of 5% based on the protection of floodplain vegetation. The next most limiting criteria is the protection of benthic invertebrates and fish, with an allowable reduction of 9%. This provides some corroboration for the 9.5% reduction recommended by this report, but it also highlights the potential importance of the missing floodplain vegetation assessments. It is again commendable that the report acknowledges a commitment to future reevaluations as the system recovers from Hurricane Michael”.*

With regards to the technical aspects of the MFL report, the Panel members indicated that they didn’t find major issues in the establishment of MFLs in the Middle Econfina Creek, that would likely impact the overall results or interpretation of the results presented by the District. Most of the comments and questions from the Panel could be addressed by enhancing the report with additional information about the underlying assumptions or methods, or in limited cases, by incorporating further analyses or justifications for their omission. The full list of comments provided by the reviewers is presented in **Appendix A** through **Appendix C**.

The methods and approaches implemented for the calibration of the HEC-RAS model were in general appropriate and adhered to standard hydraulic modeling and calibration practices. The calibration period was shorter than ideal and restricted to the time following Hurricane Michael and the subsequent debris removal efforts to return the system to a normal state. This resulted in limitations regarding the range of flows used to constrain the model during calibration and particularly for low flows. Nevertheless, the Panel considered that the data used during calibration represented the best available information. Considering the above limitations, Dr. Munson recommended that *“the model should be further validated/re-calibrated as additional data becomes available. The report might identify the conditions that would allow consideration of recalibration, such as a specific length of time or a specific high and low flow being observed”.*

The main comment from the Panel potentially requiring additional analyses in the MFL report was related to the list of species considered for the System for Environmental Flow Analysis (SEFA) modeling. Dr. Hamel and Dr. Munson indicated that the SEFA modeling was missing information related to habitat requirements for the Oval Pigtoe and Gulf Moccasinshell which are the two federally designated endangered (listed) species present in the Middle Econfina Creek. They recommended that the District, in the absence of specific Habitat Suitability Curves (HSC) for these mussel species, consider using other available HSC—even generic ones—for benthic invertebrates. These alternative HSC have been used in other Minimum Flows and Levels (MFL) studies and could provide insight into potential habitat changes for the benthic species of greatest conservation concern. The reviewers noted that the current number of HSCs implemented in the SEFA modeling was likely protective of the mussel species and they did not expect the additional analyses to change the MFL results. They also indicated that incorporating the SEFA analyses related to the benthic invertebrate habitats would strengthen the MFL study.

Other Panel comments related to the technical details of the MFL report are elaborated in the following sections. Comments related to figure clarifications, typos, and other minor clarification requests can be found in the full list of comments provided by the reviewers in **Appendix A** through **Appendix C**.

## 4.0 COMMENTS ON SUPPORTING DATA AND INFORMATION

The peer reviewers used the following guidance for determining the adequacy of the multiple hydrologic, chemical, and biological data and other information used by the District to establish MFLs for the Middle Econfina Creek:

- The data and information used were properly collected;
- Reasonable quality assurance assessments were performed on the data and information;
- Exclusion of available data from the analyses was justified; and
- The data used was the best information available.

The peer reviewers did not provide independent review of standard operating procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and the District's hydrologic monitoring network. The Panel assumed that data from these agencies adhere to protocols that ensure high quality and reliability.

### 4.1 HYDROLOGY, CHEMICAL AND BIOLOGICAL DATASETS

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The peer review Panel concluded that the information used by the District to conduct the hydrology, meteorologic and water quality characterization of the Middle Econfina Creek including the Gainer, Sylvan, and Williford spring groups was adequate. The Panel did not raise concerns regarding the data sources or data quality, nor did they identify additional data sources that would indicate the data used by the District was anything less than the best available. Mr. Wyss noted that *"the gauging of the Middle Econfina Creek study area is quite dense which eliminated many assumptions typically used in many hydrologic studies"*.

The availability of hydrologic data seemed appropriate to support the analyses presented in the MFL report despite the significant disruptions that have rippled through the system in the past 10 years and in particular following Hurricane Michael. The District used data from multiple sources and agencies to support the MFL study including:

- United States Geological Survey (USGS) stream flows and levels on the Econfina Creek (1 location),
- District stream flows and levels at multiple locations along the Econfina Creek (5 locations),
- Spring flows at the Gainer, Sylvan, and Williford springs groups, Devil's Hole and Econfina Blue Spring
- District water levels at Deer Point Lake (1 location),
- National Weather Service (NWS) precipitation records (2 locations)
- Groundwater monitoring wells (6 sites)
- Spring group water quality grab samples collected by the District, Florida Department of Environmental Protection (DEP) and USGS over the past decades (multiple locations)
- District hydrologic database with Individual Water Use Permits (IWUPs) for definition of groundwater withdrawal rates

In addition to the publicly available hydrology datasets and monitoring networks from the District listed above, the District conducted data-dense cross-section bathymetric surveys to ensure a high quality and adequate representation of the geomorphological characteristics and flow conditions in the Econfina HEC-RAS Creek hydraulic model.

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The MFL report provided an adequate description of dataset availability including details on the frequency, or time resolution of the available data, and data collection methods for instream surface water and ground water measurements. Details related to methods used to measure spring flow in the Gainer, Sylvan, and Williford springs groups were not found in the MFL report. Therefore, the Panel recommended the District to include information regarding methods implemented for measuring spring flows (Section 3.1).

Raw data preprocessing of available datasets for the MFL analyses seemed consistent with current industry practices. As an example, Mr. Wyss indicated in regard to the precipitation datasets that *“The authors used the closest stations to the study area with the best available data. Due to missing data at NWS USC00086842 in September 2023-December 2023 the authors used data from NWS USW00073805 for that 4-month period. It is customary and scientifically sound to patch or append missing timeseries at one station with observed data from another station. NWS USC00086842 and NWS USW00073805 are approximately 10 miles from one another and comparison of station location against PRISM 30-Year Normals (<https://prism.oregonstate.edu/normals/>) shows the two locations rainfall differs by approximately 4mm per year (0.25% of annual total)”*.

Finally, the MFL report presents current and projected groundwater withdrawal rates derived from reported groundwater withdrawals by permittees with IWUPs. Quality assurance/quality control (QA/QC) measures on data are described in the report indicating that groundwater withdrawal records entered into the District’s database are cross-checked with independent IWUP pumping audits performed by regulatory staff. The groundwater withdrawal data seemed appropriate. The Panel did not express concerns regarding groundwater withdrawal rates used for the MFL study.

## 4.2 WATER RESOURCE VALUES AND METRIC DETERMINATION

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The District presented a detailed evaluation of WRV used in the determination of MFLs in the Middle Econfina Creek. Section 62-40.473, Florida Administrative Code, lists 10 environmental or WRVs that must be considered in the establishment of MFLs. The MFL report indicates that to determine which WRVs were most appropriate for the Gainer, Sylvan, and Williford Springs Groups, District staff reviewed each WRV based upon the following three criteria:

- Potential for significant harm to the WRV as a result of spring flow reductions
- Relevance to middle Econfina Creek and Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group and associated spring runs
- Measurable, quantifiable relationship with flow, and can be characterized with available data

The Panel considered that the selection of WRV targets for the definition of the MFLs for Middle Econfina Creek was adequate for the system and well supported by evidence of existing uses. The District’s operation and maintenance of several recreational areas within the Econfina Creek Water Management Area, including the Pitt, Sylvan Spring, and Williford Spring recreation areas, contributes to a robust understanding of the system, enabling effective identification of critical bioecological and recreational aspects of the system that need protection.

The MFL report indicates that the establishment of quantitative criteria relating WRV targets to spring flows for assessing potential flow reduction impacts was based on criteria previously defined and implemented in other approved and scientific peer-reviewed MFL studies of similar ecosystems. The Panel considered the approach reasonable and consistent with WRV criteria used in similar MFL studies.

The omission of some WRVs for the definition of the MFLs for Middle Econfina Creek was based on evidence of existing uses and system conditions, as well as on reasonable assumptions regarding future uses. As an example, the decision to exclude water quality as a WRV was reasonable and justified by the existing water

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quality conditions of the system and the District's extensive efforts to protect Econfina Creek watershed through land acquisition coupled with minimal projected growth in the area.

From the selected WRVs, the Panel recommended that the District consider the use of alternative or more specific terminology when referring to the WRV target of "Fish Passage" as this term usually infers migratory movement across human-made structures while the WRV used in the definition of the MFLs in Middle Econfina Creek is more closely related to hydrologic connectivity within the system and between habitats. Dr. Hamel noted that *"Given the fish community present in Econfina Creek, what we are really talking about is maintaining connectivity throughout the system. Fish passage infers movement above a barrier, often in relation to migratory species. However, migratory species (potamodromous or anadromous fishes) are not present in this system. There are several fluvial-dependent species though, and they require access to different habitat types throughout the year. Fortunately, using the criteria for fish passage (thalweg depth of 0.6 ft) inadvertently does a good job in maintaining connectivity for the fish community, despite the metric not really being relevant to any one particular species"*.

## 5.0 COMMENTS ON TECHNICAL ASSUMPTIONS, PROCEDURES, AND ANALYSES

The peer reviewers used the following criteria for determining the adequacy of the technical assumptions, procedures and analyses used by the District to establish MFLs for the Middle Econfina Creek:

Criteria for assessing technical assumptions:

- The assumptions are clearly stated, reasonable and consistent with the best information available;
- Other analyses that would require fewer assumptions but provide comparable or better results are available.

Meanwhile, the criteria for assessing procedures and analyses included:

- The procedures and analyses were appropriate and reasonable, based on the best information available;
- The procedures and analyses incorporate all necessary factors;
- The procedures and analyses were correctly applied;
- The limitations and imprecision in the information were reasonably handled;
- The procedures and analyses are repeatable;
- Conclusions based on the procedures and analyses are supported by the data.

### 5.1 ECONFINA CREEK AND WATERSHED

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The Panel considered that most of the assumptions, procedures, and analysis used for the characterization of the Middle Econfina Creek and watershed, including the Gainer, Sylvan, and Williford spring groups were reasonable and aligned with those used in other Florida MFL studies.

With regards to the analyses used for the characterization of the Middle Econfina Creek and watershed (Section 2), most of the comments presented to the District suggested clarifications or text additions/modifications to facilitate the interpretation of the analyses. Some of the comments offered by the Panel are listed below:

- One of the comments from the peer reviewers related to the Middle Econfina Creek ecoregion's background on climate and rainfall was to consider if invoking the association of precipitation patterns with the Atlantic Multidecadal Oscillation (AMO) is relevant within the arguments for the MFL. In the MFL

report, the analyses related to precipitation (Section 2.6) indicate that in addition to short-term fluctuations among and within years, the AMO is a long-term fluctuation in sea surface that impacts long-term precipitation and temperature patterns in North Florida (NOAA 2000). The report then associates the lower precipitation from 1998 to 2013 with the recent warmer phase of AMO. However, the report also indicates that the period of 2013 to 2021 has been a period of rainfall surplus based on the 10-year moving average rainfall. Because both, lower than average and higher than average precipitation periods have occurred during the recent warmer phase of AMO, it seems that these correlations are not strong at first sight. Dr. Munson indicated that *“because this is a bimodal river, it might be expected that the dominance between the southern and northern AMO pattern are not as pronounced, as we might expect in a system exhibiting only one of the patterns. This might explain when the relationship between the AMO phases and precipitation appear less consistent”*.

- Another comment related to precipitation and climatic pattern analyses, was that *“if the year 2013 is of significance to the MFL please define how more clearly in the document”*. Dr. Munson indicated that *“the report makes frequent reference to the difference between 1998-2012 and 2013-2021. 2013 was a notably wet year with two tropical storms. It is unclear why the 2013 is meaningful to the MFL though it is interesting. A case was made that 2013-2021 was different then 1998- 2012. But no case was made that 2013 – 2021 was unprecedented in the record”*.
- The Panel considered that the description of the significant impacts of Hurricane Michael on the Econfina Creek was well presented and supported by significant evidence. Dr. Munson indicated that *“The notion that hurricane Michael 2018 altered the floodplain so drastically that it serves as the beginning the model calibration period is very logical and well presented”*.
- For the water quality characterization of spring groups, the MFL report indicates that available grab samples collected at different vents within a spring group by the District, DEP and USGS over the past decades were used to obtain a composite chemical signature of the spring groups. The water quality data were relatively sparse, but the report did not discuss if there were chemical signature variations between vents. The Panel considered relevant to inform if there is a certain degree of consistency between those grab samples so that they are comparable from one sample date to the next and can be composite to identify the chemical signature of the spring groups without incorporating bias from site selection. Dr. Munson noted that *“There are spring groups in Florida where the chemical composition varies markedly from vent to vent (e.g. Rainbow River). If you are using daily averages across multiple grab samples from different and varying vents, it is important to state that this is reasonable approach to construction a time series. Additionally, the report should confirm that samples between vents are similar enough that they represent the Spring groups without introducing bias from site selection.”*
- An additional comment regarding the water quality characterization of spring groups was that it was not completely clear why the MFL report used a Mann-Kendall test to examine long-term trends in nitrate, conductivity, and dissolved oxygen instead of a parametric approach in just a standard linear regression. Dr. Hamel noted that *“The data does not suggest a non-linear pattern. If the authors wanted to take this a step further, they could incorporate a change-point analysis to see if a change occurs in a time series data set”*. He also indicated that providing additional information about the structure of the data and the justification as for why the Mann-Kendall test was selected would be helpful to demonstrate the robustness of the approach.

## 5.2 HYDROLOGY

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The Panel considered that most of the hydrology assumptions, procedures and analysis used in the MFL study were reasonable and aligned with those used in other Florida MFL studies. The use of period of record flows, rather than seasonal flow blocks for the development of MFLs in the Middle Econfina Creek was considered adequate and consistent with previous MFLs. Dr. Munson pointed out that the approach was consistent with the Rainbow River MFL which *“has average flows only slightly higher than the flows at CR 388 and is similar in lack of fluctuation. It also discharges into a backwater from an impoundment”*.

In general, several of the hydrology-related comments provided by the Panel could be addressed by incorporating additional information to support the assumptions or analyses and/or, text modifications or clarifications to enhance the interpretation of the procedures and results.

With regards to the hydrologic analyses of flow seasonality, trends, and climatic conditions (Section 3.4 – Section 3.6), some of the comments offered by the Panel are listed below:

- *“Regarding the use of the USF<sup>1</sup> method (Perry 1995) for estimating baseflow – the selection is valid, and reasonable. However, in recent years different methods have been applied to different systems. The USF method has been used for Gum Slough by the SWFWMD and now is being used by the NFWMD with a similar argument justification, which is reasonable. Both systems utilize the 61-day window from the USF method. Conversely, on Weeki Wachee River, Santa Fe River and the Ichetucknee River I believe a slightly different HYSEP method (of which the USF is a modified variation) was used employing different window lengths ranging from 30 to 90 days”*.

The Panel considered that the MFL document and future MFL studies would benefit from additional discussions related to the choice of method for baseflow separation and selected time window for the analysis. *“As use of any tool in MFL determinations increase, there is a tendency of future studies to justify the continued application by referencing earlier decisions. Therefore, discussion of tool selection, or a citation with greater support, is important”*.

- Regarding the use of the two sample-test to identify differences in long term baseflow averages, the assessment of the results should take into consideration the sample size to inform if changes in long term averages are significant. Dr. Hamel noted that *“with a degrees of freedom of 9,158, this test will have a high statistical power and will likely result in a significant result. The issue with this statistical power is that differences can be very small and still result in a statistical difference. Therefore, it is important to look at the effect size (i.e., the practical significance) to determine the biological significance”*. He also noted that while the two sample-test is an appropriate test, *“additional post-hoc tests such as the Cohen’s D can be used to check the magnitude of the difference in means. Alternatively, if you are concerned about specific shifts in mean annual flow, a change-point analysis may provide added benefits of statistically determining when (and how many) changes occur”*.
- For the Gainer Spring Group trend analyses on flows, which used the Mann-Kendall test, the Panel suggested as in other previous comments related to the use of this non-parametric test to provide additional information to justify its use over a parametric test based on a linear regression. In addition, Dr. Hamel noted that it would be beneficial to include a measure of variance when reporting means, as this would facilitate the detection of statistical differences from very small differences among means.

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<sup>1</sup> University of South Florida

## 5.3 WATER RESOURCE VALUES AND METRIC DETERMINATION

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There were no major comments on the definition of WRV metrics for the establishment of MFLs in the Middle Econfina Creek. The Panel considered that the assumptions, procedures, and analysis used in the definition of WRV metrics were reasonable and supported by evidence of system conditions and uses, and consistent with metrics implemented in other similar MFLs. The omission of WRVs in cases where associations with a quantifiable metric was not possible was well-argued and deemed reasonable. Dr. Munson commented for example that *“the use of two different power boat standards in the stream is consistent with other MFLs where specific uses have been considered and standards which are not possible to achieve are disregarded”*.

## 5.4 MODELS USED IN MINIMUM FLOW DETERMINATION

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The Panel considered that the models selected to support the hydraulic and biological assessments of stream habitat variations with flows are defensible, reproducible, and consistent with models implemented in other Florida MFL studies. Mr. Wyss noted that *“the authors applied HEC-RAS standard modeling practices and used the best available data to develop cross sections (i.e. high-resolution digital elevation model, recent cross-sectional survey data, surveyed bridge dimensions, and replacement of digital elevation model elevations within the channel with survey data). Collecting additional survey cross section data eliminated using assumptions usually applied to the development of HEC-RAS models”*.

The Panel also considered that the use of a steady flow model was appropriate and applicable for the hydraulic analyses conducted in the Middle Econfina Creek. Furthermore, the methodology employed for calibrating the HEC-RAS model adhered to widely accepted and conventional modeling practices. Mr. Wyss noted that *“The authors applied HEC-RAS standard modeling practices to calibrate the model (i.e. adjusting channel and floodplain roughness coefficients, including additional of interpolated cross sections to improve model stability near bridge crossings, adjusting ineffective flow areas, and modifying channel cross-section geometry)”*.

While the methods and approaches implemented for the calibration of the HEC-RAS model were appropriate, the peer reviewers noted existing limitations in the calibration dataset of flows used to constrain the model. These limitations primarily stem from the fact that the calibration period was restricted to the time following Hurricane Michael and the subsequent debris removal efforts to return the system to a normal state. Dr. Munson noted that *“the HEC-RAS model is particularly challenging because the calibration period is shortened by Hurricane Michael. The district has done commendable work in clearing debris, collecting new survey data, and creating a model. However, the model’s calibration, for low flows particularly, is less well validated than is desirable. It does represent the best available information. The report has committed to re-evaluation/adaptive management in the future as more data becomes available”*. Considering the above limitations Dr. Munson recommended that *“the model should be further validated/re-calibrated as additional data becomes available. The report might identify the conditions that would allow consideration of recalibration, such as a specific length of time or a specific high and low flow being observed”*.

Other comments offered by the Panel regarding models used in minimum flow determination (Section 5 MFL Report), are listed below:

- The MFL report indicates that for the calibration of the HEC-RAS model *“Goodness of fit was determined by graphical comparison of simulated to measured rating curves”* even though the report also includes conventional performance calibration statistics such as mean squared error (MSE), correlation coefficient, R-squared, and Nash-Sutcliffe. The Panel suggest a better description of the calibration approach. Dr. Munson noted that *“The description of goodness-of-fit could be improved. The claim is made the inspection legitimizes the calibration”*.

## Peer Review for the Recommended Minimum Flow for Middle Econfina Creek including Gainer, Sylvan, and Williford Spring Groups

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- An additional comment on the HEC-RAS model calibration performance pertains to the stage-discharge curves presented from Figure 5-4 to Figure 5-6. In particular, there seems to be an inflection point in the rating curve at station WFWMD 8100 (Econfina Creek Below Gainer Spring Group) at approximately 450 cfs (Figure 5-5). The document would benefit from discussion of this figure and of the inflection point.

Finally, it is important to note that when the Panel started the review of the MFL report, the document referenced specific cross section numbers throughout the HEC-RAS modeling section, including in calibration sections comparing simulated versus observed stage-discharge curves. However, the original report figures depicting the HEC-RAS modeling segments (Figure 5-1) did not include these HEC-RAS cross section numbers. During the peer review, the Panel requested that the District provide an updated map showing the HEC-RAS cross sections and to incorporate updated figures with cross section numbers into the report. The District provided revised HEC-RAS figures, which the Panel found to be consistent with the analyses presented in the HEC-RAS sections.

## 5.5 EVALUATION OF WATER RESOURCES VALUES AND RESULTS

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As previously mentioned in the summary of peer review comments section of this report (Section 3.0), the main comment from the Panel potentially requiring additional analyses in the MFL report was related to the list of species considered for the SEFA modeling. Dr. Hamel and Dr. Munson indicated that the SEFA modeling was missing information related to habitat requirements for the Oval Pigtoe and Gulf Moccasinshell which are the two listed species present in the Middle Econfina Creek. They recommended that the District, in the absence of specific HSCs for these mussel species, consider using other available HSCs—even generic ones—for benthic invertebrates. These alternative HSCs have been used in other MFL studies and could provide insight into potential habitat changes for the benthic species of greatest conservation concern. The reviewers noted that the current number of HSCs implemented in the SEFA modeling was likely protective of the mussel species and they did not expect the additional analyses to change the MFL results. They also indicated that incorporating the SEFA analyses related to the benthic invertebrate habitats would result in a more defensible approach for habitat protection in the Middle Econfina Creek.

Other comments offered by the Panel regarding the evaluation of WRVs and modeling results (Section 6.0 MFL report), are presented below:

- The MFL report used wetted perimeter to evaluate riparian bank habitat and bankfull flows under both low and high flows, and indicated that the approach was consistent with previous MFL assessments including those for the Aucilla/Wacissa River MFL, and the Rainbow River MFL (SRWMD 2016, SWFWMD 2017). For the wetted perimeter evaluations, a weighted composite was derived from multiple river segments across two separated reaches of the study area: one above cross-section 6361 and one below. The study area was divided at cross section 6361, because downstream of this location the *“Econfina Creek widens as it transitions into Deer Point Lake Reservoir resulting in wetted perimeter on the order of 10-20 times that of the transects throughout most of the model domain”*. The report indicates that the domain separation was intended to avoid bias in the weighted wetted perimeter computation from the wider transects located in the lowest portion of the study domain.

With regards to the low flow protection analyses, the Panel noted potential differences between the analyses conducted for the Middle Econfina Creek and those reported in other MFL studies particularly due to the use of weighted wetted perimeter composites instead of evaluating wetted perimeter at each cross-section. Dr. Munson noted that *“the report cites the Rainbow River and the Aucilla river MFL reports. In the Rainbow River MFL the Lowest Wetted Perimeter Inflection Point (LWPIP) was used, as has often been done, to protect low flows by identifying the point at which streambed habitat would be lost rapidly with decreasing flows. Stalnaker (1995) refers to it as a surrogate for minimally acceptable habitat. In this report the LWPIP is an aggregate of all stations weighted by subsegment length. This is different than many rivers that evaluate LWPIP cross section by cross section.*

*This report recognizes the importance of different habitat types in part by identifying two reaches of the river as distinct and separating them. The argument for this is the same as the argument for not aggregating the weighted cross-section. That pools and deeper segments might dull the ability to protect some shallow runs or riffles that represent ecologically unique habitat but smaller volumes of the river. It is unlikely in a river with high base flow, and a backwater effect, that the LWPIP is limiting. However, a pool is not the same as a run and aggregation of the area for assessment of the LWPIP (i.e. toe of bank) seems suspect since it might discount the rarer habitat in the low flow assessment (i.e. that which is common might not be that which is most subject to loss). Further, the cited Rainbow River MFL does not aggregate (weight) the cross section into a single curve but examines each cross-section in the Rainbow River HEC-RAS model. It also acknowledges this technique provides unique protection when applied to riffle and shoal areas which are purposely selected for use in the instream flow evaluation models and present in the HEC-RAS models (Page 84 of the SWFWMD 2017B).*

In light of the methodological differences identified, Dr. Munson indicated that “given the high base flow in the river and the lack of very shallow water (as shown by the prevalence of boat passage) it is likely the treatment does not result in loss of a critical metric. The treatment is consistent with the cited Aucilla River report. However, it is not consistent with the cited Rainbow River Report for low flow analysis. Therefore, additional justification of the methodology is desirable. It should be noted that most often in MFL analysis the hydraulic controls in the river are identified as part of the selection of XSs locations and in the physical habitat simulation model riffle pool run segments will be purposely identified”.

- With regards to the analyses presented for high flows, Dr. Munson noted that “the wetted perimeter was also one of only 2 methods used to assess floodplain inundation or out of channel flow as a means of protecting high flows. Importantly this is linked to the protection of 5 WRVs (page 102). The report cites the use of wetted perimeter to evaluate floodplain inundation/connection for both the Aucilla and Rainbow Rivers. For this application the aggregation of all reach weighted cross section is appropriate and consistent with both reports. However, the Econfina report identified the 1-to-1 point on this aggregate curve as the critical point and finds the flow reduction that results in a 15% habitat reduction from that flow, for each of two identified segments. This is reasonable and I believe consistent with the Aucilla report. However, the Rainbow was cited as well and seems to have many similarities with Econfina Creek. However, the SWFWMD used an AUC<sup>2</sup> reduction approach when evaluating habitat loss to evaluate protection over a range of flows and time. Given the lack of data following Michael (woody habitat, snag habitat, vegetative transects etc.) would this make more sense. It would serve at least as a temporary proxy for some of the other common but missing indicators?”

Dr. Munson concluded requesting “additional discussion of the single elevation criteria (versus CDF reduction) given that wetted perimeter is the only metric successfully developed for the protection of high flows and that it represents presumed protection for 5 WRVs. A single point is a reasonable addition when buttressed by vegetative transects, sang habitat, woody debris etc and other indicators are intermediate flows.”

- A final comment related to the wetted perimeter analyses, and particularly the text presented in page 129, is the need for additional details on how the wetted perimeter analysis is used to determine the allowable change in flow for a 15% reduction. Dr. Hamel commented that “it is stated that a 15% reduction results in an allowable flow reduction of 10.78%. Is this the maximum reduction that would still allow for water to surpass the top of bank inflection point and enter into the floodplain?”. Dr. Hamel inquired whether temporal or seasonal variations have been considered in the out-of-bank flow analyses, as the

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<sup>2</sup> Area Under the Curve

## Peer Review for the Recommended Minimum Flow for Middle Econfina Creek including Gainer, Sylvan, and Williford Spring Groups

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significance of out-of-bank flows may not be equal throughout the year. Therefore, it appears that the MFL report could benefit from additional information regarding the presence or absence of seasonal variations.

- In Section 6.2.2, page 131 of the MFL report, the justification for the development of a regression curve for the minimum top of bank elevation is unclear. Dr. Munson noted that *“while it represents an average slope, floodplain inundation often occurs through localized overtopping points, where water is allowed to escape into the floodplain, often remaining trapped when flood waters recede into the channel. In such cases, the lowest observed points facilitating connection would be the most critical, rather than an average. Further, the text seems to imply the out of bank flow was only evaluated at a single transect, (7624). The stage flow relationship is not linear in the way the derived regression equation is linear so how does analyzing cross section 7624 translate upstream or down?”*. He also noted that it would be beneficial to provide a more comprehensive explanation of how bankfull and out-of-bank flows have been evaluated throughout the length of the study corridor.

## 6.0 REFERENCES

- Northwest Florida Water Management District (2025). Recommended Minimum Flow for Middle Econfina Creek, including Gainer Spring, Williford Spring, and Sylvan Spring Groups Washington and Bay Counties, Florida. Draft Report.
- Perry, R.G. (1995). Regional Assessment of Land Use Nitrogen Loading of Unconfined Aquifers. Ph.D. Dissertation, University of South Florida, Tampa, Florida.
- Southwest Florida Water Management District (2017). Recommended Minimum flow for the Rainbow River System, Revised Final Draft Report. Technical Report of the Southwest Florida Water Management District, Brooksville, Florida.
- Stalnaker, C.B; Lamb, B.L.; Henriksen, J.; Bovee, K.; Bartholow, J. (1995) The Instream Flow Incremental Methodology: a primer for IFIM. Biological Report 29. United States National Biological Service, Fort Collins, Colorado. 45 p.
- Suwannee River Water Management District (2016). Minimum Flows and Levels for the Aucilla River, Wacissa River and Priority Springs. Technical Report prepared for the Southwest Florida Water Management District.

**APPENDIX A: PEER REVIEW COMMENT FORM: DR. ADAM MUNSON**



**APPENDIX A– PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

<b>Name and Affiliation of Reviewer: Adam Munson PhD, PE. University of Florida</b>	<b>Discipline specialty covered by this review: MFL History, Statistical Methods.</b>
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This document is for the use of PEER REVIEWERS retained by the Northwest Florida Water Management District (DISTRICT) for the purpose of providing a technical peer review of a DISTRICT report, including appendices prepared by DISTRICT staff and consultants.

**REVIEW REQUIRED**

**1. Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

- a. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:
  - a. The data and information used were properly collected; and
  - b. Reasonable quality assurance assessments were performed on the data and information.

Note: The PEER REVIEWERS are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and DISTRICT hydrologic monitoring networks.

- b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:
  - a. If the assumptions are clearly stated, reasonable, and consistent with the best available information; and
  - b. Assumptions were eliminated to the extent possible, based on available information.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

- c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:
  - a. The procedures and analyses were appropriate and reasonable, based on the best available information;
  - b. The procedures and analyses incorporate appropriate factors;
  - c. The procedures and analyses were correctly applied;
  - d. Limitations and imprecision 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.

**2. If a proposed method used in the MFL report is not scientifically reasonable, the PEER REVIEWERS shall:**

- a. Deficiencies: List and describe scientific deficiencies;
- b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
- c. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible, provide an estimate of the time and effort required to develop and implement; and
- d. If the identified deficiencies cannot be remedied, the, if possible, identify one or more alternative methods that are practical, cost-effective, and scientifically reasonable, based on published literature to the extent feasible.

**REVIEW CONSTRAINTS**

CONTRACTOR and PEER REVIEWERS shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes and Chapter 62-40.473, Florida Administrative Code) affecting the DISTRICT’s development of MFLs. CONTRACTOR and PEER REVIEWERS shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board are not included in the scope of work. These include:

- 1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set.
- 2. The Definition of what constitutes “significant harm” to the water resources of ecology of the area;
- 3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and

APPENDIX A– PEER REVIEW FORM  
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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.




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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

Instructions:

1. The results of this review are for the use of the DISTRICT and they are not to be revealed to others without the express permission of the DISTRICT.
2. By signing this form, the PEER REVIEWER certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042 (5), in the discipline noted above.
3. The Peer Reviewer also certifies that the review was conducted according to the scope and conditions specified above.

Signature of Peer Reviewer: 	Date of Peer Review: 2/28/2025
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Responders Certification: the comments and criticisms proved by the PEER REVIEWER have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments:	
Signature of Responder:	Date of Response:

APPENDIX A– PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT



Review of "Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida"



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NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

Comment No.	Figure, Table, or Page and	Does Comment Directly and Materially Affect	To be completed by PEER REVIEWER(S)	
			a. PEER REVIEWERS Specific Comments	b. PEER REVIEWERS specific recommended Corrective Action
		OVERALL IMPRESSION	The report does a reasonable job given the recent climatic impacts on the system. The overall approach is reasonable, uses the best available-if at times limited-data, and is well supported by previously established MFLs. Furthermore, the high degree of public ownership of lands in the contribution area, the lack of foreseeable consumptive uses and the relatively unimpacted nature of the system offer ample evidence that the system is not in recovery and is likely to remain largely unimpacted within the planning period. Additionally, the 9.5% reduction in historic flows is within the range of other MFLs developed for spring-dominated systems (2.5 – 15% reductions in flow)	
1	Figure 1-1, Page 25	No	The reference to Figure 1-1 on page 24 discusses the confluence of Bear Creek (among other features). Bear creek is not mentioned on in the figure.	Label the map or remove the reference.
2	Page 77	No	Regarding the use of the USF method (Perry 1995) for estimating baseflow – the selection is valid, and reasonable. However, in recent years different methods have been applied to different systems. The USF method has been used for Gum Slough by the SWFWMD and now is being used by the NFWFMD with a similar argument justification, which is reasonable. Both systems utilize the 61-day window from the USF method. Conversely, on Weeki Wachee River, Santa Fe River and the Ichetucknee River I believe a slightly different HYSEP method (of which the USF is a modified variation) was used employing different window lengths ranging from 30 to 90 days.	No corrective action is necessary, the use is reasonable. However, the document, as well as future efforts, would benefit from additional discussion of the choice of method, and specifically the choice of associated window length.  As use of any tool in MFL determinations increase, there is a tendency of future studies to justify the continued application by referencing earlier decisions. Therefore, discussion of tool selection, or a citation with greater support, is important.
3	Page 18	No	The choice to use Period of Record flows rather than seasonal flow blocks is reasonable and consistent with previous MFLs. Most notable the Rainbow River MFL did not use seasonal blocks, has average flows only slightly higher than the flows at CR 338 and is similar in lack a	No action needed.



**APPENDIX A– PEER REVIEW FORM  
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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			fluctuation. It also discharges into a backwater from an impoundment.	
4	Page 20	Potentially	The Rainbow River, which shares some similarities with this system, has an allowable flow reduction of 5% based on the protection of floodplain vegetation. The next most limiting criteria is the protection of benthic invertebrates and fish, with an allowable reduction of 9%. This provides some corroboration for the 9.5% reduction recommended by this report, but it also highlights the potential importance of the missing floodplain vegetation assessments. It is again commendable that the report acknowledges a commitment to future reevaluations as the system recovers from hurricane Michael.	No action needed
5	Page 48	No	Here the report discusses the lower precipitation from 1998 to 2013 and attributes it to the warmer phase of the AMO. The Report also mention several years above average rainfall from 2013 to 2021. This also happened in the warmer AMO period.  Because this is a bimodal river, it might be expected that the dominance between the southern and norther pattern are not as pronounced, as we might expect in a system exhibiting only one of the patterns. This might explain why the relationship between the AMO phases and precipitation appear less consistent.	Consider if invoking the AMO as the rational for the low rainfall is salient to the argument for the MFL.
6	Page 50	No	There are spring groups in Florida where the chemical composition varies markedly from vent to vent (Rainbow). If you are using daily averages across multiple grab samples from different and varying vents, it is important to state that this is reasonable approach to construction a time series. Additionally, the report should confirm that samples between vents are similar enough that they represent the spring groups without introducing bias from site selection.	
7	Table 2-3	No	3 samples from between 1970 -2009 indicates 1970, 2009, and one other year. Consider just placing the dates or the years for the three samples.	
8	Page 114	Potentially	The report does not make use of any form of HSC for inverts. The only listed species identified are both mussels. There are generic curves for benthic invertebrates available, from Gore, which have been used on a significant number of rivers in Florida for MFL development. The report should detail why the habitat	Revise report to address the lack of an HSC which addresses the two listed species of mussels.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			curves that are available were not used.	
9	Page 69	No	Flow measurement methodology is unclear.	The report should specify the methods used in measuring flow. If this is part of a data collection program or documented elsewhere a citation is sufficient.
10	Page 97	No	The use of two different power boat standards in the stream is consistent with other MFLs where specific uses have been considered and standards which are not possible to achieve are disregarded.	N/A
11	Page 105 and 108	No	Figures should provide river station or XS number for cross sections.	Add XS or RS numbers to figures showing cross sections.
12	Page 109	No	The description of goodness-of-fit could be improved. The claim is made that inspection legitimizes the calibration. It is also noted that having only higher flows during the calibration period prevents a meaning comparison of low flows. Figures 5-4 and 5-6 appear similar at a casual glance figure 5-5 presents more notable discrepancies. Specifically, both the base rating and the measured data seem to show an inflection at about 450 CFS. A feature which the model does not capture. It is noted that traditional goodness-of-fit metrics are present in Table 5-2.	The document would benefit from discussion of figure 5-5 and acknowledgement of the inflection point.
13	Figure 6-2	No	The red line and green line are composed of two different standards. A 15 and a 30-foot width. This could be improved with either color change or a vertical line indication where in the river you change from the 15 to the 30-foot criteria	Recommend an alteration to the figure for clarity.
14	Page 131	?	The justification for using a regression line is unclear. While it represents an average slope, floodplain inundation often occurs through localized overtopping points, where water is allowed to escape into the floodplain, often remaining trapped when flood waters recede into the channel. In such cases, the lowest observed points facilitating connection would be the most critical, rather than an average. Further, the text seems to imply the out of bank flow was only evaluate at a single transect, (7624). The stage flow relationship is not linear in the way the derived regression equation is linear so how does analyzing cross section 7624 translate upstream or down?	Please clarify the last paragraph of page 131 and explain more fully how bank full/out of bank flows have been evaluated over the length of the study corridor.
15	General	No	In most MFLs the impacts of water use are evaluate through use of a groundwater model. In this MFL total withdrawals were calculated and a 1-to-1 flow reduction was made from the historic record. This is conservative as the report points out. How will proposed ground water	No need to comment.



**APPENDIX A– PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			withdrawals be evaluated again the MFL?	
16	Page 48, 78 and others	No	<p>The report makes frequent reference to the difference between 1998-2012 and 2013-2021. 2013 was a notably wet year with two tropical storms. It is unclear why 2013 is meaningful to the MFL though, it is interesting. A case was made that 2013-2021 was different then 1998-2012. But no case was made that 2013 – 2021 was unprecedented in the record.</p> <p>The notion that hurricane Michael in 2018 altered the floodplain so drastically that it serves as the beginning the model calibration period is very logical and well presented.</p>	If 2013 is of significance to the MFL please define how more clearly in the document.
17	Section 5.1	Yes	<p>The HEC-RAS model is particularly challenging because the calibration period is shortened by Hurricane Michael. The district has done commendable work in clearing debris, collecting new survey data, and creating a model. However, the model’s calibration, for low flows particularly, is less well validated than is desirable. It does represent the best available information. The report has committed to re-evaluation/adaptive management in the future as more data becomes available.</p>	<p>The model should be further validated/re-calibrated as additional data becomes available. The report might identify the conditions that would allow consideration of recalibration, such as a specific length of time or specific high and low flows being observed.</p>
18	Section 6.2.1	Yes	<p>The reports uses wetted perimeter to evaluate both high and low flows. For low flows it examines an aggregated toe of bank and similarly for high flows a top of bank.</p> <p>A) (Low flow protection) The report cites the Rainbow River and the Aucilla river MFL reports. In the Rainbow River MFL the LWPIP was used, as has often been done, to protect low flows by identifying the point at which streambed habitat would be lost rapidly with decreasing flows. Stalnaker (1995) referees to it as a surrogate for minimally acceptable habitat. In this report the LWPIP is an aggregate of all stations weighted by subsegment length. This is different than many rivers that evaluate LWPIP cross section by cross section. This report recognizes the importance of different habitat types in part by identifying two reaches of the river as distinct and separating them. The argument for this is the same as the argument for not aggregating the weighted cross-section. That pools and deeper segments might dull the ability to protect some shallow runs or</p>	<p>Given the high base flow in the river and the lack of very shallow water (as shown by the prevalence of boat passage) it is likely the treatment does not result in loss of a critical metric. The treatment is consistent with the cited Aucilla River report. However, it is not consistent with the cited Rainbow River Report for low flow analysis. Therefore, additional justification of the methodology is desirable. It should be noted that most often in MFL analysis the hydraulic controls in the river are identified as part of the selection of XSs locations and in the physical habitat simulation model riffle pool run segments will be purposely identified.</p>



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			<p>riffles that represent ecologically unique habitat but smaller volumes of the river. It is unlikely in a river with high base flow, and a backwater effect, that the LWPIP is limiting. However, a pool is not the same as a run and aggregation of the area for assessment of the LWPIP (ie toe of bank) seems suspect since it might discount the rarer habitat in the low flow assessment (ie, that which is common might not be that which is most subject to loss). Further, the cited Rainbow River MFL does not aggregate (weight) the cross section into a single curve but examines each cross-section in the Rainbow River HEC RAS model. It also acknowledges this technique provides unique protection when applied to riffle and shoal areas which are purposely selected for use in the instream flow evaluation models and present in the HECRAS models (Page 84 of the SWFWMD 2017B).</p>	
19	Section 6.2.1	Yes	<p>B) (High flow protection) The wetted perimeter was also one of only 2 methods used to assess floodplain inundation or out of channel flow as a means of protecting high flows. Importantly this is linked to the protection of 5 WRVs (page 102). The report cites the use of wetted perimeter to evaluate floodplain inundation/connection for both the Aucilla and Rainbow Rivers. For this application the aggregation of all reach weighted cross section is appropriate and consistent with both reports. However, the Econfina report identified the 1-to-1 point on this aggregate curve as the critical point and finds the flow reduction that results in a 15% habitat reduction from that flow, for each of two identified segments. This is reasonable and I believe consistent with the Aucilla report. However, the Rainbow was cited as well and seems to have many similarities with Econfina Creek. However, the SWFWMD used an AUC reduction approach when evaluating habitat loss to evaluate protection over a range of flows and time. Given the lack of data following Michael (woody habitat, snag habitat, vegetative transects etc.) would this make more sense. It would serve at least as a temporary proxy for</p>	<p>Request additional discussion of the single elevation criteria (versus CDF reduction) given that wetted perimeter is the only metric successfully developed for the protection of high flows and that it represents presumed protection for 5 WRVs. A single point is a reasonable addition when buttressed by vegetative transects, sang habitat, woody debris and other indicators but considering multiple elevations simultaneously seems more inclusive in the absence of the more common array of indicators..</p>



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			some of the other common but missing indicators?	
Page 22	No		Space in second line between “of/Ecofina”	
Page 40	No		Fix Reference Error	
Page 57	No		“the reference at the end of the second paragraph for Figure 2-21 needs to be fix.	Replace 2-21 with 2-24?
Figure 3-18	No		Note that the post Michael condition is really post debris removal	
Page 88	No		Space between dates 10/10/2018 and 8/29/2019	typo

**APPENDIX B: PEER REVIEW COMMENT FORM: DR. MARTIN HAMEL**



**APPENDIX A – PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

<b>Name and Affiliation of Reviewer:</b>  Martin Hamel, University of Georgia	<b>Discipline specialty covered by this review:</b>  Biology/ecology in flowing systems
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This document is for the use of PEER REVIEWERS retained by the Northwest Florida Water Management District (DISTRICT) for the purpose of providing a technical peer review of a DISTRICT report, including appendices prepared by DISTRICT staff and consultants.

**REVIEW REQUIRED**

**1. Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

- a. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:
  - a. The data and information used were properly collected; and
  - b. Reasonable quality assurance assessments were performed on the data and information.

Note: The PEER REVIEWERS are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and DISTRICT hydrologic monitoring networks.

- b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:
  - a. If the assumptions are clearly stated, reasonable, and consistent with the best available information; and
  - b. Assumptions were eliminated to the extent possible, based on available information.



**APPENDIX A – PEER REVIEW FORM  
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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

- c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:
  - a. The procedures and analyses were appropriate and reasonable, based on the best available information;
  - b. The procedures and analyses incorporate appropriate factors;
  - c. The procedures and analyses were correctly applied;
  - d. Limitations and imprecision 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.

**2. If a proposed method used in the MFL report is not scientifically reasonable, the PEER REVIEWERS shall:**

- a. Deficiencies: List and describe scientific deficiencies;
- b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
- c. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of the time and effort required to develop and implement; and
- d. If the identified deficiencies cannot be remedied, the, if possible, identify one or more alternative methods that are practical, cost-effective, and scientifically reasonable, based on published literature to the extent feasible.

**REVIEW CONSTRAINTS**

CONTRACTOR and PEER REVIEWERS shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes and Chapter 62-40.473, Florida Administrative Code) affecting the DISTRICT’s development of MFLs. CONTRACTOR and PEER REVIEWERS shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board are not included in the scope of work. These include:

- 1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
- 2. The definition of what constitutes “significant harm” to the water resources or ecology of the area;
- 3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and



**APPENDIX A – PEER REVIEW FORM  
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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.

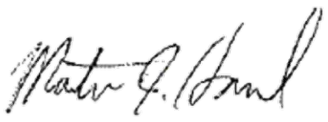


**APPENDIX A – PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

Instructions:

1. The results of this review are for the use of the DISTRICT and they are not to be revealed to others without the express permission of the DISTRICT.
2. By signing this form, the PEER REVIEWER certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042 (5), in the discipline noted above.
3. The Peer Reviewer also certifies that the review was conducted according to the scope and conditions specified above.

<p>Signature of Peer Reviewer:</p> 	<p>Date of Peer Review:</p> <p style="text-align: center;"><i>2/27/2025</i></p>
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Responders Certification: the comments and criticisms proved by the PEER REVIEWER have been addressed as noted in column C in a separate response document, which is attached, and in the report.

<p>Name and Affiliation of Responder to Peer Review Comments:</p>	
<p>Signature of Responder:</p>	<p>Date of Response:</p>



**APPENDIX A – PEER REVIEW FORM  
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

Comment No.	Figure, Table, or Page and	Does Comment Directly and Materially Affect	To be completed by PEER REVIEWER(S)	
			a. PEER REVIEWERS Specific Comments	b. PEER REVIEWERS specific recommended Corrective Action
1	P.51, Table 2-5	No	I am curious as to why a Mann-Kendall test was used to examine long-term trends in nitrate, conductivity, and d.o. Why not use a parametric approach (i.e., linear regression)? The data does not suggest a non-linear pattern. If the authors wanted to take this a step further, they could incorporate a change-point analysis to see if a change occurs in a time series data set.	Perform a linear regression
2	Figure 2-23	No	I would like to see a more detailed figure caption. It is not clear to me what the green and red lines represent. I thought that the red line was going to be the maximum stage experienced during the hurricane, but the blue line exceeds this value.	Provide additional detail in figure caption.
3	P. 78, Figure 3-4	No	I would urge caution in using a two-sample t-test to compare long-term baseflow averages. With a degrees of freedom of 9,158, this test will have a high statistical power and will likely result in a significant result. The issue with this statistical power is that differences can be very small and still result in a statistical difference. Therefore, it is important to look at the effect size (i.e., the practical significance) to determine the biological significance.	While this is an appropriate test, additional post-hoc tests such as the Cohen’s D can be used to check the magnitude of the difference in means. Alternatively, if you are concerned about specific shifts in mean annual flow, a change-point analysis may provide added benefits of statistically determining when (and how many) changes occur.
4	P. 89 (3.6)	No	Refer back to comment #1 and #3 for use of the Mann-Kendall trend test and t-test. I also think it would be beneficial to include a measure of variance when reporting means (i.e., SD or SE). Seeing the variance will speak to my point in comment #3 about statistical power and the ability to detect statistical differences from very small differences among means.	Consider alternative analyses and include variance when reporting means.
5	P. 97	No	Given the fish community present in Econfina Creek, what we are really talking about is maintaining connectivity throughout the system. Fish passage infers movement above a barrier, often in relation to migratory species. However, migratory species (potamodromous or anadromous fishes) are not present in this system. There are several fluvial-dependent species though, and they require access to different habitat types throughout the year. Fortunately, using the criteria for fish passage	Consider alternative assessment or terminology.



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			(thalweg depth of 0.6 ft) inadvertently does a good job in maintaining connectivity for the fish community, despite the metric not really being relevant to any one particular species.	
6	P.113	Perhaps, but not likely	The district provided comments and alternative text to better describe how area weighted suitability is calculated. A statement was made that said “Substrate was not utilized in the Econfina Creek evaluation as it consisted exclusively of sands and displayed no variability”. I find it difficult to believe that the entire stream bed is sand with no variability at all. Is this a post-hurricane effect? Many of the stream fishes listed as present in Econfina Creek have habitat preferences of silt, mud, gravel, and aquatic vegetation.	Corroborate there is no variation in substrate (only sand).
7	P.113	Not likely	It is stated that habitat suitability curves were not available for either species of mussels or their host species. While there may not be published HSI curves for the species, there is information that can be inferred. Given that the two mussels are federally endangered species, I think these should be a focal point in establishing a MFL that ensures no harm for the species. The recovery plan for the two mussels provides habitat associations (i.e., slow to moderate current, sand/silt/gravel substrates, etc.). I agree that the number of curves analyzed is likely protective of the species, I believe the MFL is less credible (from a fish and wildlife water resource value perspective) using HSI information from mostly generalist species, and not accounting for species of greatest conservation concern.	Incorporate best available information of habitat requirements for Oval Pigtoe and Gulf Moccassinshell into habitat suitability.
8	P. 127	No	It would be good to cite a figure that outlines where XS 6361 is located at.	Reference a map that shows XS 6361
9	P. 129	Not likely	The calculation of weighted wetted perimeter seems appropriate and using the inflection points to describe top and toe of banks makes sense. I am having difficulty understanding how this was used to determine the allowable change in flow for a 15% reduction. It is stated that a 15% reduction results in an allowable flow reduction of 10.78%. Is this the maximum reduction that would still allow for water to surpass the top of bank inflection point and enter into the floodplain?  As a river ecologist, I know the value of out-of-bank flows to increase overall river productivity, but also to provide important fish nursery habitats during the late	Additional information to describe procedures.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			<p>spring/summer months. Have you considered including temporal aspects to your analysis? The importance of out of bank flows is not equal throughout the year. Furthermore, the number of times the river enters into the floodplain and the duration of inundation are important metrics that are not discussed.</p>	
10	P. 132	No	<p>It was stated that the estimate of top of bank at CR 388 resulted in bankfull flows not being achieved under any flow condition modeled. This doesn't seem right as bankfull flows certain occur at some point. Is this the reason why the elevation data was not considered further? That was not clear to me.</p>	<p>Provide additional clarification.</p>

**APPENDIX C: PEER REVIEW COMMENT FORM: MR. JEREMY WYSS**

APPENDIX A PEER REVIEW FORM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of "Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida"

<b>Name and Affiliation of Reviewer:</b>  Jeremy Wyss, Tetra Tech	<b>Discipline specialty covered by this review:</b>  Hydrologic and Hydraulics Modeling
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**REVIEW REQUIRED**

**1. Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

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  - i. The data and information used were properly collected; and
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Note: The PEER REVIEWERS are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and DISTRICT hydrologic monitoring networks.
- b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:
  - i. If the assumptions are clearly stated, reasonable, and consistent with the best available information; and
  - ii. Assumptions were eliminated to the extent possible, based on available information.
- c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:
  - i. The procedures and analyses were appropriate and reasonable, based on the best available information;
  - ii. The procedures and analyses incorporate appropriate factors;
  - iii. procedures and analyses were correctly applied;
  - iv. Limitations and imprecision in the information were reasonably handled;
  - v. The procedures and analyses are repeatable; and
  - vi. Conclusions based on the procedures and analyses are supported by the data.

**2. If a proposed method used in the MFL report is not scientifically reasonable, the PEER REVIEWERS shall:**

- a. Deficiencies: List and describe scientific deficiencies;
- b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies:
  - i. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of the time and effort required to develop and implement; and
  - ii. If the identified deficiencies cannot be remedied, the, if possible, identify one or more alternative methods that are practical, cost-effective, and scientifically reasonable, based on published literature to the extent feasible.

**REVIEW CONSTRAINTS**

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NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of "Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida"

1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The definition of what constitutes "significant harm" to the water resources or ecology of the area;
3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and
4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.

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3. The Peer Reviewer also certifies that the review was conducted according to the scope and conditions specified above.

Signature of Peer Reviewer: 	Date of Peer Review: 2/26/2025
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Responders Certification: the comments and criticisms proved by the PEER REVIEWER have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments:	
Signature of Responder:	Date of Response:

Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

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- Section 1 (Introduction) describes the objective, background, conceptual approach, as well as a short description of the study area.
  - The objective, background, and conceptual approach are clearly stated, well defined, and supported well in the remaining sections of the document.
  - Page 22 Paragraph 1, typo, change ofEconfina to of Econfina
- Section 2 (Econfina Creek and Watershed) presents a detailed physical description of middle Econfina Creek as well as Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.
  - 2.1 Econfina Creek and Watershed describes the hydrologic regime considerations of the Middle Econfina Creek study area.
    - The authors consideration of what contributes to the study areas hydrologic regime is well thought out and clearly stated. The best available information is being used.
  - 2.2 Econfina Creek Springs describes the springs in the Middle Econfina Creek study area.
    - The authors description of the spring groups in the study area is well thought out and clearly stated. The best available information is being used.
  - 2.3 and 2.4 Physiography and Hydrogeology describes the groundwater contributing area and aquifer system under the Middle Econfina Creek study area.
    - The authors used multiple sources of information [(Richards 1997), (Chelette and Sutton, 2017), (Rupert and Means, 2009),] in the text but the source of the Groundwater contributing area to the Gainer-Sylvan-Williford group of springs polygon used in figures 2-9, 2-10, 2-11, and 2-12 is unclear. Was it obtained from one of the mentioned sources or created/digitized as part of this study? Please clarify in the report.
  - 2.5 Land Use, Population and Structural Alterations describes additional hydrologic regime considerations of the Middle Econfina Creek study area.
    - The authors clearly stated the information, and the best available and most up to date information is being used.
    - The authors conclusion “no noticeable effect of lake level fluctuations on stage at Econfina Creek @ CR 388” is correct and supported by the data. A more robust data analysis comparing Deer Point Lake stage to Econfina Creek @ CR 388 could have been completed but it is clear from visual examination of Figure 2-15 that lake level has no impact on stage of Econfina Creek @ CR 388.
  - 2.6 Precipitation presents long-term annual and monthly precipitation analysis for the Middle Econfina Creek study area.
    - The authors used the closest stations to the study area with the best available data. Due to missing data at NWS USC00086842 in September 2023-December 2023 the authors used data from NWS USW00073805 for that 4-month period. It is customary and scientifically sound to patch or append missing timeseries at one station with observed data from another station. NWS USC00086842 and NWS USW00073805 are approximately 10 miles from one another and comparison of station location against PRISM 30-Year Normals (<https://prism.oregonstate.edu/normals/>) shows the two locations rainfall differs by approximately 4mm per year (0.25% of annual total).
  - 2.7 Water Quality presents the water quality data that has been collected for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group over the past several decades.
    - The data were relatively sparse however the authors did a good job of analyzing the available data for trends. The authors conclusion “potential reductions in flow caused from groundwater withdrawals would likely not significantly affect water quality for the Gainer Spring Group and Econfina Creek” was supported by the data and their analysis for trends.

## NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- 2.8 Impact from Hurricane Michael on Econfina Creek presents a detailed description of instream and upland impacts caused by Hurricane Michael.
  - The authors carefully considered how the impacts of Hurricane Michael may have altered or changed the Middle Econfina Creek study area’s hydrologic regime and highlighted this where appropriate in other sections of the document.
- 2.9 Natural Resources discusses the natural resource values of the Middle Econfina Creek study area.
  - The authors consideration the study areas natural resource values is well thought out and clearly stated.
- 2.10 Recreation discusses the recreation values of the Middle Econfina Creek study area.
  - The authors consideration the study areas recreation values is well thought out and clearly stated.
- Section 3 (Hydrology) presents a detailed evaluation of hydrological characteristics of Econfina Creek and its springs as well as a summary of the District’s hydrologic data collection along Econfina Creek.
  - 3.1 Hydrologic Data Collection discuss the NFWFMD and USGS stream, spring, and groundwater gauging stations of the Middle Econfina Creek study area.
    - The authors are using the best available information and discuss all the information in the Middle Econfina Creek study area. The gauging of the Middle Econfina Creek study area is quite dense which eliminated many assumptions typically used in many hydrologic studies.
  - 3.2 Econfina Creek Discharge describes Econfina Creek flow at four surface water stations.
    - The authors are using the best available information, and the flow frequency curve analysis was appropriate, reasonable, and readily reproduceable.
  - 3.3 Econfina Creek Spring Discharge describes discharge for first and second magnitude springs located along Econfina Creek.
    - The authors are using the best available information, and the flow frequency curve analysis was appropriate, reasonable, and readily reproduceable.
    - Table 3-6 is unable to be reproduced based on the information available in the report. Table 3-4 identifies median flows for Williford Spring Group (42 cfs) and Sylvan Spring Group (18 cfs), and the sum is 60 cfs. Combined Williford, Sylvan, and Econfina Blue spring groups median flow is provided as 74 cfs. Where did the additional 14 cfs come from? Was it Blue Spring? A summary of Blue Spring flow is not presented in table 3-4 and Blue Spring is mentioned only in passing in section 3.1.
  - 3.4 and 3.5 Hydrologic Evaluation for USGS Station 2359500 Econfina Creek Near Bennett, FL and Hydrologic Evaluation for NFWFMD Station 8458 Econfina Creek @SR 20 present a detailed hydrologic evaluation to determine the relationship between observed changes in flow and stage with changes in climatic conditions and groundwater levels in the vicinity of Econfina Creek.
    - The authors used customary, appropriate, reasonable, and reproducible flow data summary procedures to reduce daily flow data noise to determine baseflow, monthly average flow, annual average flow, and test for trends in the flow data. The various conclusions within the section, most importantly “baseflow, derived primarily from spring discharge in the middle reaches of Econfina Creek, accounts for the majority of flow in Econfina Creek under low- to moderate-flow conditions” and “fluctuations in baseflow are consistent with fluctuations in cumulative rainfall” is supported by the data and associated analyses.
    - Figure 3-7 Baseflow Econfina Creek @ CR388 timeseries is different (in 2019) than what is plotted in previous figures (i.e. Figure 3-6 and figure 3-4).
    - Figure 3-14 Baseflow Econfina Creek @ SR20 timeseries appears different (in 2022) than what is plotted in previous figure (i.e. Figure 3-12)

## APPENDIX A PEER REVIEW FORM

### NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

#### Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- 3.6 Gainer Spring Group Discharge Trends presents a detailed evaluation to assess trends in the Gainer Spring Group discharge data.
  - The authors used customary, appropriate, reasonable, and reproducible spring flow data summary procedures. The conclusion “the observed increase in spring discharge is likely due to increased precipitation” is supported by the data and associated analyses.
- 3.7 Groundwater Withdrawals and Considerations for Baseline Flow Records presents a summary of groundwater withdrawals in Washington and Bay counties and within the Middle Econfina Creek GWCA.
  - The authors clearly stated the information, and the best available and most up to date information is being used. The authors used correctly applied the available data to the study area and the limitations and imprecision in the available data were reasonably handled by maintaining a high degree of conservativeness.
  - The estimates in table 3-10, table 3-12, table 3-13, and table 3-14 are reasonable so long as the GWCA shapefile (see comments for section 2.3 and 2.4) was appropriate for use in this study.
- Section 4 (Water Resource Values) describes the consideration of 10 water resource values defined in Rule 62-40.473, Florida Administrative Code, as they relate to the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group MFL evaluation, and the associated metrics used to quantify the potential effects of reduced spring flows.
  - Recreation In and On the Water
    - The Middle Econfina Creek study area provides extensive recreational opportunities including boating, swimming, tubing, and fishing.
      - Using a minimum water depth of 2.0 ft. across a continuous channel width of 30 ft to evaluate safe boat passage below the SR 20 bridge is an appropriate metric for the study area.
      - Using a minimum water depth of 2.0 ft. across a continuous channel width of 15 ft to evaluate safe boat passage above the SR 20 bridge is an appropriate, but highly conservative, metric for the study area.
      - Using a minimum thalweg depth of 1.5 ft. for safe canoe/kayak passage is an appropriate metric for the study area.
  - Fish and Wildlife Habitat and the Passage of Fish
    - The Middle Econfina Creek study area provides habitat to numerous recreationally important fish species with largemouth bass being the native fish species capable of reaching the largest body depth. Middle Econfina Creek study area provides habitat for numerous aquatic species.
      - Using a minimum thalweg depth of 0.6 ft. for safe fish passage is an appropriate metric for the study area.
      - Using System for Environmental Flow Analysis (SEFA) software and predicting the amount of available habitat (Area Weighted Suitability (AWS)) is appropriate for the study area.
  - Estuarine Resources
    - Due to the Deer Point Lake Reservoir estuarine conditions are not present within the Middle Econfina Creek study area and it is appropriate to not consider this WRV.
  - Transfer of Detrital Material
    - Little quantifiable data is available regarding the transport of detrital material in Econfina Creek or its relationship to flow characteristics. Using frequency of out-of-bank flows as a function of streamflow as a proxy for detrital material is appropriate for the study area.

## NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- Maintenance of Freshwater Storage and Supply
  - Maintaining long-term freshwater storage for non-consumptive uses and environmental resources is the prime objective for establishing a MFL flow regime. Considering the frequency of out-of-bank flows as a function of streamflow as a proxy for maintaining long-term freshwater storage is appropriate for the study area.
- Aesthetic and Scenic Attributes
  - Aesthetic and scenic attributes refer to passive uses of the river such as nature viewing, hiking, and photography. These uses are one of the main reasons for the popularity of Econfina Creek for recreational uses. The vegetation (instream and riparian) and wildlife are addressed under WRV2 Fish and Wildlife Habitats and the Passage of Fish. Therefore, protection of this WRV is incorporated in metrics pertaining to Recreation and Fish and Wildlife Habitats. It is appropriate to not directly consider this WRV for the study area.
- Filtration and Absorption of Nutrients and Other Pollutants
  - Information concerning the filtration and absorption of nutrients and other pollutants is currently unavailable for Econfina Creek. As a result, this WRV was unable to be associated with a directly quantifiable metric. Using frequency of out-of-bank flows as a function of streamflow as a proxy for filtration and absorption of nutrients and other pollutants is appropriate for the study area.
- Sediment Loads
  - Information concerning sediment size and transport downstream is currently unavailable for Econfina Creek. As a result, this WRV was unable to be quantified. Using frequency of out-of-bank flows as a function of streamflow as a proxy for sediment loads is appropriate for the study area.
- Water Quality
  - Levels of nitrate at Gainer Spring Group are relatively low, with an average concentration of 0.20 mg/L. Average specific conductance at Gainer Spring was 136 uS/cm indicating minimal salinity impacts. Neither parameter has a statistically significant relationship with spring flow or stream flow. Additionally, due to the extensive efforts by the District to protect Econfina Creek watershed through land acquisition coupled with minimal projected growth in the area, water quality is not anticipated to be of concern for this system. It is appropriate to not directly consider this WRV for the study area.
- Navigation
  - The District has defined this WRV as the navigation of commercial vessels within the study area. Econfina Creek is not used for commercial navigation. It is appropriate to not directly consider this WRV for the study area.
- Selection of Water Resource Values and Associated Metrics
  - The water quality WRV is not listed in 4.11 Selection of Water Resource Values and Associated Metrics. 4.9 Water Quality states metrics pertaining to water quality were not utilized in the MFL determination. Water Quality ought to be added to the “not relevant section.”

**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

- Section 5 (Hydrologic Models) briefly describes the development of hydrologic models utilized to evaluate water resource value metrics and determine minimum flows. Modeling reports are provided as Appendix A and B of this document
  - 5.1 HEC-RAS Model Development and Calibration
    - The authors did a good job of providing a very clear and high-level overview and condensing a 44-page modeling report to less than 8 pages of figures and text.
    - The authors applied HEC-RAS standard modeling practices and used the best available data to develop cross sections (i.e. high-resolution digital elevation model, recent cross-sectional survey data, surveyed bridge dimensions, and replacement of digital elevation model elevations within the channel with survey data). Collecting additional survey cross section data eliminated using assumptions usually applied to the development of HEC-RAS models.
    - The authors used the best available data to determine flow inputs (i.e. hydrologic data from all available stations along Econfina Creek) and eliminated typical HEC-RAS assumption associated with flow due to the dense gauging network.
    - The authors applied HEC-RAS standard modeling practices to calibrate the model (i.e. adjusting channel and floodplain roughness coefficients, including additional of interpolated cross sections to improve model stability near bridge crossings, adjusting ineffective flow areas, and modifying channel cross-section geometry).
    - The HEC-RAS model performance and goodness of fit figures and statistics showed a tight relationship between simulated and observed measurements meaning the model is well calibrated and suitable for use to evaluate water resource value metrics and determine minimum flows in the Middle Econfina Creek study area.
  - 5.2 SEFA Model
    - The authors did a good job of providing a very clear and high-level overview and condensing a 39-page modeling report to less than 2 pages of figures and text.
    - The authors used the best available data and information to couple the hydraulic model with habitat suitability relationships for specific classes of species to determine relationships between streamflow and available habitat.
    - Table 5-3 does not contain an entry for black banded darter however Appendix A of Econfina SEFA Task 4 December 9.docx presents habitat suitability curves for black banded darter and black banded darter is a documented species to occur in Econfina creek.
- Section 6 (Evaluation of Water Resource Values) provides the evaluation of the applicable water resource value metrics utilizing hydrologic models to quantify the effects of potential spring flow reductions.
  - 6.1 Passage (Low Flow) Metrics Evaluation
    - The authors clearly and concisely stated how the HEC-RAS model was used to assess canoe/kayak passage, power boat passage, and fish passage within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproduceable.
    - The authors conclusion “safe canoe and kayak passage was possible at all river transects evaluated in the study area under all flow scenarios” was supported by the analysis and data.
    - The authors conclusion “for all but three transects assessed, safe power boat passage was possible under all flow scenarios, including all transects below Gainer Spring Group” was supported by the data.
    - The authors calculated allowable flow reduction of 92 cfs (21.92%) was fully supported by the data, transparent, defensible, and reproduceable.
    - The authors conclusion “safe fish passage was possible at all transects evaluated in the study area under all flow scenarios” was supported by the data.

**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

- 6.2 Bankfull and Out-of-Bank Flow Evaluation
  - The authors clearly and concisely stated how the HEC-RAS model was used to assess bankfull and of out-of-bank flows within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproducible.
  - The authors evaluation of wetter perimeter in two stages (i.e. above and below XS 6361) is appropriate for the Econfina MFL study area.
  - The authors calculated allowable flow reduction of 69 cfs based on weighted wetted perimeter was fully supported by the data, transparent, defensible, and reproducible.
- 6.3 Evaluation of In Stream Habitat
  - The authors clearly and concisely stated how the SEFA model was used to assess in stream habitat within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproducible.
  - The authors calculated allowable flow reduction of 51 cfs based on the slow shallow guild taxa, which is a common taxa in the Econfina MFL study area, was fully supported by the data, transparent, defensible, and reproducible.
- Section 7 (Summary and Recommended Minimum Flows) provides the recommended minimum flow regimes for middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.
  - The authors appropriately summarized the body of work used to produce the minimum flow. The conclusions drawn in this section match the conclusion drawn in the specific sections provided earlier in the report. All of the conclusion were well supported, reasonable, defensible, and reproducible by the analysis and data in those sections.
  - The authors recommended minimum flow of an allowable flow reduction of 51 cfs from the Econfina Creek @ CR 388 gauge average baseline flow of 537 cfs is protective for Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group. based on the body of work presented in this report.

Overall, it is abundantly clear that the authors took great care in developing the Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group MFL. The author’s approach is clearly stated, the best available data has been used, assumption were identified and minimized to the best extent possible, and all conclusions were supported by the data and analysis. Models developed to support the MFL followed standard modeling practices and were well calibrated and the models were utilized in a practical way. The authors final recommended minimum flow of an allowable flow reduction of 51 cfs is protective for Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.

## Review of supporting appendices

### Econfina Creek HEC-RAS technical report 112224.docx

- Section 1 (Introduction and Model Domain) describes the objective, background, conceptual approach, as well as a short description of the study area.
  - The objective, background, and conceptual approach are clearly stated, well defined, and supported well in the remaining sections of the document.
- Section 2 (HEC-RAS Model Development) documents data sources and discusses how data were utilized to develop the HEC-RAS model.
  - 2.1 Geoprocessing, Projection System, and Digital Elevation Model
    - The authors took appropriate steps to ensure that all data used a consistent spatial reference system and used appropriate conversion factors when necessary.
  - 2.2 Model initialization and digitization



**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

to the impacts of Hurricane Michael. The authors conclusion “stage-discharge relationship upon completion of debris removal in the Econfina Creek channel similar to historical” is supported by the data and analysis.

- 3.2 Model calibration locations and targets
  - The authors selection of calibration stations and period of record for calibration is reasonable and justified based on the available data.
- 3.3 Initial model simulation
  - The authors providing the results of the initial model simulation appropriately justifies the authors need to revise the model to increase model performance. The authors conclusion “initial Manning’s n values were likely too high, additional conveyance needed to be added, and model geometry at all transects needed to be reviewed to ensure accuracy and consistency” is supported by the initial model results data.
- 3.4 Calibration Parameter Adjustments and Model Performance
  - The authors clearly and thoroughly discussed their thought processes and the approaches they took to calibrate the model and increase model performance. The authors used customary H&H modeling techniques and the approaches they took are scientifically sound and defensible.
  - The HEC-RAS model performance and goodness of fit shows a tight relationship between simulated and observed measurements meaning the model is well calibrated and suitable for use to evaluate water resource value metrics and determine minimum flows in the Middle Econfina Creek study area.
  - The authors final calibrated values of Mannings N are reasonable and are within literature ranges.

### Econfina SEFA Task 4 December 9.docx

- Section 1 (INTRODUCTION) describes the objective, background, and conceptual approach.
  - The objective, background, and conceptual approach are clearly stated and well defined.
    - Typo page 2, taxon/lie stage should be taxon/life stage
- Section 2 (ECONFINA CREEK – GENERAL DESCRIPTION) provides a brief overview of the Econfina Creek watershed study area.
  - Page 3 states “Econfina Creek itself has a surface water basin covering 275 square miles (~176,000 acres), however the draft technical assessment on page 26, section 2.1, paragraph 1 states “Econfina Creek watershed is approximately 188 square miles.” Which one is correct? Please ensure that the descriptions match between the documents.
  - Page 3 states “This 41,363-acre watershed in Washington and Bay counties runs 14 miles along the course of Econfina Creek.” What watershed is 41,363? What is 14 miles long? The draft technical assessment and HEC-RAS report state the study area is the 11.8-mile portion of Econfina Creek between Williford Spring and Deer Point Lake. Please ensure that the descriptions match between the documents.
- Section 3 (DATA SOURCES) documents data source and discusses how data were utilized to develop the HEC-RAS model.
  - Table 2 does not match table 2-6 and table 2-7 in the draft technical assessment. Table 2 omits American eel and Grass carp from the draft technical assessment table 2-6 and Gulf Spike, Rayed Creekshell, Iridescent Lilliput, Southern Rainbow, and Little Spectaclecase from the draft technical assessment table 2-7. It is not documented why all species identified in the draft technical assessment are not considered in the SEFA modeling.
  - Table 3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.

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- Comparing table 4 in the SEFA report to table 2-3 in the HEC-RAS report shows that Table 4 is 1.8 cfs greater. As described in section 5.2 of the main report this is due to the adjustment of +1.78 cfs (representative of total 2020 groundwater withdrawals within the Econfina GWCA). For complete transparency, flow adjustments ought to be discussed in the SEFA report since this adjustment for scenario modeling is not mentioned in the HEC-RAS report but the HEC-RAS model is documented as the source for the flows in table 4.
- Section 5 (APPLICATION OF SEFA RESULTS TO DEVELOPMENT OF THE MFL FOR ECONFINA CREEK)
  - The authors clearly and concisely described how SEFA model results are interpreted for use in determining the MFL.

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Counties, Florida”**



Comment No.	Figure, Table, or Page and Paragraph No.	Does Comment Directly and Materially Affect Conclusions of Report? (Yes or No)	Specific Comments	Specific recommended Corrective Action
1	Draft_techassess_Econfina_250131.docx Page 22 Paragraph 1	No	typo	change ofEconfina to of Econfina
2	Draft_techassess_Econfina_250131.docx figures 2-9, 2-10, 2-11, and 2-12	Yes	source of the Groundwater contributing area to the Gainer-Sylvan-Williford group of springs polygon used in listed figures is unclear	Clarify source in text and figures and/or discuss development of polygon
3	Draft_techassess_Econfina_250131.docx Table 3-6	No	Table 3-6 is unable to be reproduced based on the information available in the report. Williford Spring Group (42 cfs) and Sylvan Spring Group (18 cfs). Combined Williford, Sylvan, and Econfina Blue spring groups median flow is provided as 74 cfs. Where did the additional 14 cfs come from? Was it Blue Spring? A summary of Blue Spring flow is not presented in table 3-4 and Blue Spring is mentioned only in passing in section 3.1	Provide details in the report about Blue Spring and discuss the data availability for Blue Spring. Add Blue Spring flow summary statistics to Table 3-4. Alternatively, could update Table 3-6 to match information as provided.
4	Draft_techassess_Econfina_250131.docx Figure 3-7	No	Baseflow Econfina Creek @ CR388 timeseries is different (2019) than what is plotted in previous figures (i.e. Figure 3-6 and figure 3-4).	Plot correct timeseries in Figure 3-7. Redo linear regression between baseflow and groundwater levels (Figure 3-8) and update text below Figure 3-6.
5	Draft_techassess_Econfina_250131.docx Figure 3-14	No	Baseflow Econfina Creek @ SR20 timeseries appears different (2022) than what is plotted in previous figure (i.e. Figure 3-12).	Plot correct timeseries in Figure 3-15. Redo linear regression between baseflow and groundwater levels Figure 3-8 and update text below Figure 3-13.
6	Draft_techassess_Econfina_250131.docx table 3-10, table 3-12, table 3-13, and table 3-14	Yes	estimates in table 3-10, table 3-12, table 3-13, and table 3-14 are reasonable so long as the GWCA shapefile (see comments for section 2.3 and 2.4) was appropriate for use in this study	Clarify source of GWCA shapefile in text and figures and/or discuss development of polygon to build confidence that the correct GWCA is being used to calculate the impact of groundwater withdrawals.
7	Draft_techassess_Econfina_250131.docx 4.11 Selection of Water Resource Values and Associated Metrics, pg102	No	Water quality WRV is not listed in 4.11. Section 4.9 Water Quality states metrics pertaining to water quality were not utilized in the MFL determination.	Water Quality ought to be added to the “not relevant section.”
8	Draft_techassess_Econfina_250131.docx 5.2 SEFA Model, pg112	No	Table 5-3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.	Review and update table 5-3 for completeness.
9	Econfina SEFA Task 4 December 9.docx pg2	No	Typo	taxon/lie stage should be taxon/life stage

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10	Econfina SEFA Task 4 December 9.docx pg3	No	Page 3 states “Econfina Creek itself has a surface water basin covering 275 square miles (~176,000 acres), however the draft technical assessment on page 26, section 2.1, paragraph 1 states “Econfina Creek watershed is approximately 188 square miles.” Which one is correct?	ensure that the descriptions match between the documents.
11	Econfina SEFA Task 4 December 9.docx pg3	No	Page 3 states “This 41,363-acre watershed in Washington and Bay counties runs 14 miles along the course of Econfina Creek.” What watershed is 41,363? What is 14 miles long? The draft technical assessment and HEC-RAS report state the study area is the 11.8-mile portion of Econfina Creek between Williford Spring and Deer Point Lake.	ensure that the descriptions match between the documents.
12	Econfina SEFA Task 4 December 9.docx Table 2	No	Table 2 does not match table 2-6 and table 2-7 in the draft technical assessment. Table 2 omits American eel and Grass carp from the draft technical assessment table 2-6 and Gulf Spike, Rayed Creekshell, Iridescent Lilliput, Southern Rainbow, and Little Spectaclecase from the draft technical assessment table 2-7. It is not documented why all species identified in the draft technical assessment are not considered in the SEFA modeling.	Review table to ensure completeness
13	Econfina SEFA Task 4 December 9.docx Table 3	No	Table 3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.	Review table to ensure completeness
14	Econfina SEFA Task 4 December 9.docx Table 4	Np	Comparing table 4 in the SEFA report to table 2-3 in the HEC-RAS report shows that Table 4 is 1.8 cfs greater. As described in section 5.2 of the main report this is due to the adjustment of +1.78 cfs (representative of total 2020 groundwater withdrawals within the Econfina GWCA).	For complete transparency, flow adjustments ought to be discuss in the SEFA report since this adjustment for scenario modeling is not mentioned in the HEC-RAS report but the HEC-RAS model is documented as the source for the flows in table 4.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

<b>Name and Affiliation of Reviewer: Adam Munson PhD, PE. University of Florida</b>	<b>Discipline specialty covered by this review: MFL History, Statistical Methods.</b>
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This document is for the use of PEER REVIEWERS retained by the Northwest Florida Water Management District (DISTRICT) for the purpose of providing a technical peer review of a DISTRICT report, including appendices prepared by DISTRICT staff and consultants.

**REVIEW REQUIRED**

**1. Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

- a. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:
  - a. The data and information used were properly collected; and
  - b. Reasonable quality assurance assessments were performed on the data and information.

Note: The PEER REVIEWERS are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and DISTRICT hydrologic monitoring networks.

- b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:
  - a. If the assumptions are clearly stated, reasonable, and consistent with the best available information; and
  - b. Assumptions were eliminated to the extent possible, based on available information.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

- c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:
  - a. The procedures and analyses were appropriate and reasonable, based on the best available information;
  - b. The procedures and analyses incorporate appropriate factors;
  - c. The procedures and analyses were correctly applied;
  - d. Limitations and imprecision 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.

**2. If a proposed method used in the MFL report is not scientifically reasonable, the PEER REVIEWERS shall:**

- a. Deficiencies: List and describe scientific deficiencies;
- b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
- c. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible, provide an estimate of the time and effort required to develop and implement; and
- d. If the identified deficiencies cannot be remedied, the, if possible, identify one or more alternative methods that are practical, cost-effective, and scientifically reasonable, based on published literature to the extent feasible.

**REVIEW CONSTRAINTS**

CONTRACTOR and PEER REVIEWERS shall acknowledge the statutory constraints and conditions (Sections 373.042 and 373.0421, Florida Statutes and Chapter 62-40.473, Florida Administrative Code) affecting the DISTRICT’s development of MFLs. CONTRACTOR and PEER REVIEWERS shall also acknowledge that review of certain assumptions, conditions, and established legal and policy interpretations of the Governing Board are not included in the scope of work. These include:

- 1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set.
- 2. The Definition of what constitutes “significant harm” to the water resources of ecology of the area;
- 3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and

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4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.




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Instructions:

1. The results of this review are for the use of the DISTRICT and they are not to be revealed to others without the express permission of the DISTRICT.
2. By signing this form, the PEER REVIEWER certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042 (5), in the discipline noted above.
3. The Peer Reviewer also certifies that the review was conducted according to the scope and conditions specified above.

Signature of Peer Reviewer: 	Date of Peer Review: 2/28/2025
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Responders Certification: the comments and criticisms proved by the PEER REVIEWER have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments:	
Signature of Responder:	Date of Response:

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Comment No.	Figure, Table, or Page and	Does Comment Directly and Materially Affect	To be completed by PEER REVIEWER(S)	
			a. PEER REVIEWERS Specific Comments	b. PEER REVIEWERS specific recommended Corrective Action
		OVERALL IMPRESSION	The report does a reasonable job given the recent climatic impacts on the system. The overall approach is reasonable, uses the best available-if at times limited-data, and is well supported by previously established MFLs. Furthermore, the high degree of public ownership of lands in the contribution area, the lack of foreseeable consumptive uses and the relatively unimpacted nature of the system offer ample evidence that the system is not in recovery and is likely to remain largely unimpacted within the planning period. Additionally, the 9.5% reduction in historic flows is within the range of other MFLs developed for spring-dominated systems (2.5 – 15% reductions in flow)	
1	Figure 1-1, Page 25	No	The reference to Figure 1-1 on page 24 discusses the confluence of Bear Creek (among other features). Bear creek is not mentioned on in the figure.	Label the map or remove the reference.
2	Page 77	No	Regarding the use of the USF method (Perry 1995) for estimating baseflow – the selection is valid, and reasonable. However, in recent years different methods have been applied to different systems. The USF method has been used for Gum Slough by the SWFWMD and now is being used by the NFWFMD with a similar argument justification, which is reasonable. Both systems utilize the 61-day window form the USF method. Conversely, on Weeki Wachee River, Santa Fe River and the Ichetucknee River I believe a slightly different HYSEP method (of which the USF is a modified variation) was used employing different window lengths ranging from 30 to 90 days.	No corrective action is necessary, the use is reasonable. However, the document, as well as future efforts, would benefit from additional discussion of the choice of method, and specifically the choice of associated window length.  As use of any tool in MFL determinations increase, there is a tendency of future studies to justify the continued application by referencing earlier decisions. Therefore, discussion of tool selection, or a citation with greater support, is important.
3	Page 18	No	The choice to use Period of Record flows rather than seasonal flow blocks is reasonable and consistent with previous MFLs. Most notable the Rainbow River MFL did not use seasonal blocks, has average flows only slightly higher than the flows at CR 338 and is similar in lack a	No action needed.



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			fluctuation. It also discharges into a backwater from an impoundment.	
4	Page 20	Potentially	The Rainbow River, which shares some similarities with this system, has an allowable flow reduction of 5% based on the protection of floodplain vegetation. The next most limiting criteria is the protection of benthic invertebrates and fish, with an allowable reduction of 9%. This provides some corroboration for the 9.5% reduction recommended by this report, but it also highlights the potential importance of the missing floodplain vegetation assessments. It is again commendable that the report acknowledges a commitment to future reevaluations as the system recovers from hurricane Michael.	No action needed
5	Page 48	No	Here the report discusses the lower precipitation from 1998 to 2013 and attributes it to the warmer phase of the AMO. The Report also mention several years above average rainfall from 2013 to 2021. This also happened in the warmer AMO period.  Because this is a bimodal river, it might be expected that the dominance between the southern and norther pattern are not as pronounced, as we might expect in a system exhibiting only one of the patterns. This might explain why the relationship between the AMO phases and precipitation appear less consistent.	Consider if invoking the AMO as the rational for the low rainfall is salient to the argument for the MFL.
6	Page 50	No	There are spring groups in Florida where the chemical composition varies markedly from vent to vent (Rainbow). If you are using daily averages across multiple grab samples from different and varying vents, it is important to state that this is reasonable approach to construction a time series. Additionally, the report should confirm that samples between vents are similar enough that they represent the spring groups without introducing bias from site selection.	
7	Table 2-3	No	3 samples from between 1970 -2009 indicates 1970, 2009, and one other year. Consider just placing the dates or the years for the three samples.	
8	Page 114	Potentially	The report does not make use of any form of HSC for inverts. The only listed species identified are both mussels. There are generic curves for benthic invertebrates available, from Gore, which have been used on a significant number of rivers in Florida for MFL development. The report should detail why the habitat	Revise report to address the lack of an HSC which addresses the two listed species of mussels.



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NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT**

**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay**

			curves that are available were not used.	
9	Page 69	No	Flow measurement methodology is unclear.	The report should specify the methods used in measuring flow. If this is part of a data collection program or documented elsewhere a citation is sufficient.
10	Page 97	No	The use of two different power boat standards in the stream is consistent with other MFLs where specific uses have been considered and standards which are not possible to achieve are disregarded.	N/A
11	Page 105 and 108	No	Figures should provide river station or XS number for cross sections.	Add XS or RS numbers to figures showing cross sections.
12	Page 109	No	The description of goodness-of-fit could be improved. The claim is made that inspection legitimizes the calibration. It is also noted that having only higher flows during the calibration period prevents a meaning comparison of low flows. Figures 5-4 and 5-6 appear similar at a casual glance figure 5-5 presents more notable discrepancies. Specifically, both the base rating and the measured data seem to show an inflection at about 450 CFS. A feature which the model does not capture. It is noted that traditional goodness-of-fit metrics are present in Table 5-2.	The document would benefit from discussion of figure 5-5 and acknowledgement of the inflection point.
13	Figure 6-2	No	The red line and green line are composed of two different standards. A 15 and a 30-foot width. This could be improved with either color change or a vertical line indication where in the river you change from the 15 to the 30-foot criteria	Recommend an alteration to the figure for clarity.
14	Page 131	?	The justification for using a regression line is unclear. While it represents an average slope, floodplain inundation often occurs through localized overtopping points, where water is allowed to escape into the floodplain, often remaining trapped when flood waters recede into the channel. In such cases, the lowest observed points facilitating connection would be the most critical, rather than an average. Further, the text seems to imply the out of bank flow was only evaluate at a single transect, (7624). The stage flow relationship is not linear in the way the derived regression equation is linear so how does analyzing cross section 7624 translate upstream or down?	Please clarify the last paragraph of page 131 and explain more fully how bank full/out of bank flows have been evaluated over the length of the study corridor.
15	General	No	In most MFLs the impacts of water use are evaluate through use of a groundwater model. In this MFL total withdrawals were calculated and a 1-to-1 flow reduction was made from the historic record. This is conservative as the report points out. How will proposed ground water	No need to comment.



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			withdrawals be evaluated again the MFL?	
16	Page 48, 78 and others	No	<p>The report makes frequent reference to the difference between 1998-2012 and 2013-2021. 2013 was a notably wet year with two tropical storms. It is unclear why 2013 is meaningful to the MFL though, it is interesting. A case was made that 2013-2021 was different then 1998-2012. But no case was made that 2013 – 2021 was unprecedented in the record.</p> <p>The notion that hurricane Michael in 2018 altered the floodplain so drastically that it serves as the beginning the model calibration period is very logical and well presented.</p>	If 2013 is of significance to the MFL please define how more clearly in the document.
17	Section 5.1	Yes	<p>The HEC-RAS model is particularly challenging because the calibration period is shortened by Hurricane Michael. The district has done commendable work in clearing debris, collecting new survey data, and creating a model. However, the model’s calibration, for low flows particularly, is less well validated than is desirable. It does represent the best available information. The report has committed to re-evaluation/adaptive management in the future as more data becomes available.</p>	<p>The model should be further validated/re-calibrated as additional data becomes available. The report might identify the conditions that would allow consideration of recalibration, such as a specific length of time or specific high and low flows being observed.</p>
18	Section 6.2.1	Yes	<p>The reports uses wetted perimeter to evaluate both high and low flows. For low flows it examines an aggregated toe of bank and similarly for high flows a top of bank.</p> <p>A) (Low flow protection) The report cites the Rainbow River and the Aucilla river MFL reports. In the Rainbow River MFL the LWPIP was used, as has often been done, to protect low flows by identifying the point at which streambed habitat would be lost rapidly with decreasing flows. Stalnaker (1995) referees to it as a surrogate for minimally acceptable habitat. In this report the LWPIP is an aggregate of all stations weighted by subsegment length. This is different than many rivers that evaluate LWPIP cross section by cross section. This report recognizes the importance of different habitat types in part by identifying two reaches of the river as distinct and separating them. The argument for this is the same as the argument for not aggregating the weighted cross-section. That pools and deeper segments might dull the ability to protect some shallow runs or</p>	<p>Given the high base flow in the river and the lack of very shallow water (as shown by the prevalence of boat passage) it is likely the treatment does not result in loss of a critical metric. The treatment is consistent with the cited Aucilla River report. However, it is not consistent with the cited Rainbow River Report for low flow analysis. Therefore, additional justification of the methodology is desirable. It should be noted that most often in MFL analysis the hydraulic controls in the river are identified as part of the selection of XSs locations and in the physical habitat simulation model riffle pool run segments will be purposely identified.</p>



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			<p>riffles that represent ecologically unique habitat but smaller volumes of the river. It is unlikely in a river with high base flow, and a backwater effect, that the LWPIP is limiting. However, a pool is not the same as a run and aggregation of the area for assessment of the LWPIP (ie toe of bank) seems suspect since it might discount the rarer habitat in the low flow assessment (ie, that which is common might not be that which is most subject to loss). Further, the cited Rainbow River MFL does not aggregate (weight) the cross section into a single curve but examines each cross-section in the Rainbow River HEC RAS model. It also acknowledges this technique provides unique protection when applied to riffle and shoal areas which are purposely selected for use in the instream flow evaluation models and present in the HECRAS models (Page 84 of the SWFWMD 2017B).</p>	
19	Section 6.2.1	Yes	<p>B) (High flow protection) The wetted perimeter was also one of only 2 methods used to assess floodplain inundation or out of channel flow as a means of protecting high flows. Importantly this is linked to the protection of 5 WRVs (page 102). The report cites the use of wetted perimeter to evaluate floodplain inundation/connection for both the Aucilla and Rainbow Rivers. For this application the aggregation of all reach weighted cross section is appropriate and consistent with both reports. However, the Econfina report identified the 1-to-1 point on this aggregate curve as the critical point and finds the flow reduction that results in a 15% habitat reduction from that flow, for each of two identified segments. This is reasonable and I believe consistent with the Aucilla report. However, the Rainbow was cited as well and seems to have many similarities with Econfina Creek. However, the SWFWMD used an AUC reduction approach when evaluating habitat loss to evaluate protection over a range of flows and time. Given the lack of data following Michael (woody habitat, snag habitat, vegetative transects etc.) would this make more sense. It would serve at least as a temporary proxy for</p>	<p>Request additional discussion of the single elevation criteria (versus CDF reduction) given that wetted perimeter is the only metric successfully developed for the protection of high flows and that it represents presumed protection for 5 WRVs. A single point is a reasonable addition when buttressed by vegetative transects, sang habitat, woody debris and other indicators but considering multiple elevations simultaneously seems more inclusive in the absence of the more common array of indicators..</p>



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			some of the other common but missing indicators?	
Page 22	No		Space in second line between “of/Ecofina”	
Page 40	No		Fix Reference Error	
Page 57	No		“the reference at the end of the second paragraph for Figure 2-21 needs to be fix.	Replace 2-21 with 2-24?
Figure 3-18	No		Note that the post Michael condition is really post debris removal	
Page 88	No		Space between dates 10/10/2018 and 8/29/2019	typo



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**Review of “Recommended Minimum Flows for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group, Washington and Bay Counties, Florida”**

<b>Name and Affiliation of Reviewer:</b>  Martin Hamel, University of Georgia	<b>Discipline specialty covered by this review:</b>  Biology/ecology in flowing systems
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**REVIEW REQUIRED**

**1. Determine whether the methods used for establishing the minimum flows are scientifically reasonable.**

- a. Supporting Data and Information: Review the data and information that supports the method and the proposed minimum flows, as appropriate. The reviewer shall assume the following:
  - a. The data and information used were properly collected; and
  - b. Reasonable quality assurance assessments were performed on the data and information.

Note: The PEER REVIEWERS are not expected to provide independent review of standard procedures used as part of institutional programs that have been established for the purpose of collecting data, such as the USGS and DISTRICT hydrologic monitoring networks.

- b. Technical Assumptions: Review the technical assumptions inherent in the methodology and determine:
  - a. If the assumptions are clearly stated, reasonable, and consistent with the best available information; and
  - b. Assumptions were eliminated to the extent possible, based on available information.



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- c. Procedures and Analyses: Review the procedures and analyses used in developing quantitative measures and determine qualitatively whether:
  - a. The procedures and analyses were appropriate and reasonable, based on the best available information;
  - b. The procedures and analyses incorporate appropriate factors;
  - c. The procedures and analyses were correctly applied;
  - d. Limitations and imprecision 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.

**2. If a proposed method used in the MFL report is not scientifically reasonable, the PEER REVIEWERS shall:**

- a. Deficiencies: List and describe scientific deficiencies;
- b. Remedies: Determine if the identified deficiencies can be remedied and provide suggested remedies;
- c. If the identified deficiencies can be remedied, then describe the necessary corrections and, if possible provide an estimate of the time and effort required to develop and implement; and
- d. If the identified deficiencies cannot be remedied, the, if possible, identify one or more alternative methods that are practical, cost-effective, and scientifically reasonable, based on published literature to the extent feasible.

**REVIEW CONSTRAINTS**

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- 1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
- 2. The definition of what constitutes “significant harm” to the water resources or ecology of the area;
- 3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and



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4. The method(s) used by other District or agencies for establishing MFLs for other waterbodies and aquifers.

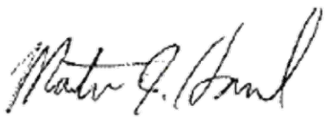


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2. By signing this form, the PEER REVIEWER certifies that the peer review was conducted according to the guidelines listed above and that the opinions and recommendations included in the review constitute an independent review per Chapter 373.042 (5), in the discipline noted above.
3. The Peer Reviewer also certifies that the review was conducted according to the scope and conditions specified above.

Signature of Peer Reviewer: 	Date of Peer Review:  <i>2/27/2025</i>
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Responders Certification: the comments and criticisms proved by the PEER REVIEWER have been addressed as noted in column C in a separate response document, which is attached, and in the report.

Name and Affiliation of Responder to Peer Review Comments:	
Signature of Responder:	Date of Response:



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Comment No.	Figure, Table, or Page and	Does Comment Directly and Materially Affect	To be completed by PEER REVIEWER(S)	
			a. PEER REVIEWERS Specific Comments	b. PEER REVIEWERS specific recommended Corrective Action
1	P.51, Table 2-5	No	I am curious as to why a Mann-Kendall test was used to examine long-term trends in nitrate, conductivity, and d.o. Why not use a parametric approach (i.e., linear regression)? The data does not suggest a non-linear pattern. If the authors wanted to take this a step further, they could incorporate a change-point analysis to see if a change occurs in a time series data set.	Perform a linear regression
2	Figure 2-23	No	I would like to see a more detailed figure caption. It is not clear to me what the green and red lines represent. I thought that the red line was going to be the maximum stage experienced during the hurricane, but the blue line exceeds this value.	Provide additional detail in figure caption.
3	P. 78, Figure 3-4	No	I would urge caution in using a two-sample t-test to compare long-term baseflow averages. With a degrees of freedom of 9,158, this test will have a high statistical power and will likely result in a significant result. The issue with this statistical power is that differences can be very small and still result in a statistical difference. Therefore, it is important to look at the effect size (i.e., the practical significance) to determine the biological significance.	While this is an appropriate test, additional post-hoc tests such as the Cohen’s D can be used to check the magnitude of the difference in means. Alternatively, if you are concerned about specific shifts in mean annual flow, a change-point analysis may provide added benefits of statistically determining when (and how many) changes occur.
4	P. 89 (3.6)	No	Refer back to comment #1 and #3 for use of the Mann-Kendall trend test and t-test. I also think it would be beneficial to include a measure of variance when reporting means (i.e., SD or SE). Seeing the variance will speak to my point in comment #3 about statistical power and the ability to detect statistical differences from very small differences among means.	Consider alternative analyses and include variance when reporting means.
5	P. 97	No	Given the fish community present in Econfina Creek, what we are really talking about is maintaining connectivity throughout the system. Fish passage infers movement above a barrier, often in relation to migratory species. However, migratory species (potamodromous or anadromous fishes) are not present in this system. There are several fluvial-dependent species though, and they require access to different habitat types throughout the year. Fortunately, using the criteria for fish passage	Consider alternative assessment or terminology.



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			(thalweg depth of 0.6 ft) inadvertently does a good job in maintaining connectivity for the fish community, despite the metric not really being relevant to any one particular species.	
6	P.113	Perhaps, but not likely	The district provided comments and alternative text to better describe how area weighted suitability is calculated. A statement was made that said “Substrate was not utilized in the Econfina Creek evaluation as it consisted exclusively of sands and displayed no variability”. I find it difficult to believe that the entire stream bed is sand with no variability at all. Is this a post-hurricane effect? Many of the stream fishes listed as present in Econfina Creek have habitat preferences of silt, mud, gravel, and aquatic vegetation.	Corroborate there is no variation in substrate (only sand).
7	P.113	Not likely	It is stated that habitat suitability curves were not available for either species of mussels or their host species. While there may not be published HSI curves for the species, there is information that can be inferred. Given that the two mussels are federally endangered species, I think these should be a focal point in establishing a MFL that ensures no harm for the species. The recovery plan for the two mussels provides habitat associations (i.e., slow to moderate current, sand/silt/gravel substrates, etc.). I agree that the number of curves analyzed is likely protective of the species, I believe the MFL is less credible (from a fish and wildlife water resource value perspective) using HSI information from mostly generalist species, and not accounting for species of greatest conservation concern.	Incorporate best available information of habitat requirements for Oval Pigtoe and Gulf Moccassinshell into habitat suitability.
8	P. 127	No	It would be good to cite a figure that outlines where XS 6361 is located at.	Reference a map that shows XS 6361
9	P. 129	Not likely	The calculation of weighted wetted perimeter seems appropriate and using the inflection points to describe top and toe of banks makes sense. I am having difficulty understanding how this was used to determine the allowable change in flow for a 15% reduction. It is stated that a 15% reduction results in an allowable flow reduction of 10.78%. Is this the maximum reduction that would still allow for water to surpass the top of bank inflection point and enter into the floodplain?  As a river ecologist, I know the value of out-of-bank flows to increase overall river productivity, but also to provide important fish nursery habitats during the late	Additional information to describe procedures.



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			<p>spring/summer months. Have you considered including temporal aspects to your analysis? The importance of out of bank flows is not equal throughout the year. Furthermore, the number of times the river enters into the floodplain and the duration of inundation are important metrics that are not discussed.</p>	
10	P. 132	No	<p>It was stated that the estimate of top of bank at CR 388 resulted in bankfull flows not being achieved under any flow condition modeled. This doesn't seem right as bankfull flows certain occur at some point. Is this the reason why the elevation data was not considered further? That was not clear to me.</p>	<p>Provide additional clarification.</p>

APPENDIX A PEER REVIEW FORM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of "Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida"

<b>Name and Affiliation of Reviewer:</b>  Jeremy Wyss, Tetra Tech	<b>Discipline specialty covered by this review:</b>  Hydrologic and Hydraulics Modeling
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1. The selection of waterbodies or aquifers for which minimum flow and/or levels are to be set;
2. The definition of what constitutes "significant harm" to the water resources or ecology of the area;
3. The consideration given to changes and structural alterations to watersheds, surface waters, and aquifers, and the effects and constraints that such changes or alterations had or placed on the hydrology of a given watershed, surface water, or aquifer; and
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Signature of Peer Reviewer: 	Date of Peer Review: 2/26/2025
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Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

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- Section 1 (Introduction) describes the objective, background, conceptual approach, as well as a short description of the study area.
  - The objective, background, and conceptual approach are clearly stated, well defined, and supported well in the remaining sections of the document.
  - Page 22 Paragraph 1, typo, change ofEconfina to of Econfina
- Section 2 (Econfina Creek and Watershed) presents a detailed physical description of middle Econfina Creek as well as Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.
  - 2.1 Econfina Creek and Watershed describes the hydrologic regime considerations of the Middle Econfina Creek study area.
    - The authors consideration of what contributes to the study areas hydrologic regime is well thought out and clearly stated. The best available information is being used.
  - 2.2 Econfina Creek Springs describes the springs in the Middle Econfina Creek study area.
    - The authors description of the spring groups in the study area is well thought out and clearly stated. The best available information is being used.
  - 2.3 and 2.4 Physiography and Hydrogeology describes the groundwater contributing area and aquifer system under the Middle Econfina Creek study area.
    - The authors used multiple sources of information [(Richards 1997), (Chelette and Sutton, 2017), (Rupert and Means, 2009),] in the text but the source of the Groundwater contributing area to the Gainer-Sylvan-Williford group of springs polygon used in figures 2-9, 2-10, 2-11, and 2-12 is unclear. Was it obtained from one of the mentioned sources or created/digitized as part of this study? Please clarify in the report.
  - 2.5 Land Use, Population and Structural Alterations describes additional hydrologic regime considerations of the Middle Econfina Creek study area.
    - The authors clearly stated the information, and the best available and most up to date information is being used.
    - The authors conclusion “no noticeable effect of lake level fluctuations on stage at Econfina Creek @ CR 388” is correct and supported by the data. A more robust data analysis comparing Deer Point Lake stage to Econfina Creek @ CR 388 could have been completed but it is clear from visual examination of Figure 2-15 that lake level has no impact on stage of Econfina Creek @ CR 388.
  - 2.6 Precipitation presents long-term annual and monthly precipitation analysis for the Middle Econfina Creek study area.
    - The authors used the closest stations to the study area with the best available data. Due to missing data at NWS USC00086842 in September 2023-December 2023 the authors used data from NWS USW00073805 for that 4-month period. It is customary and scientifically sound to patch or append missing timeseries at one station with observed data from another station. NWS USC00086842 and NWS USW00073805 are approximately 10 miles from one another and comparison of station location against PRISM 30-Year Normals (<https://prism.oregonstate.edu/normals/>) shows the two locations rainfall differs by approximately 4mm per year (0.25% of annual total).
  - 2.7 Water Quality presents the water quality data that has been collected for Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group over the past several decades.
    - The data were relatively sparse however the authors did a good job of analyzing the available data for trends. The authors conclusion “potential reductions in flow caused from groundwater withdrawals would likely not significantly affect water quality for the Gainer Spring Group and Econfina Creek” was supported by the data and their analysis for trends.

## NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- 2.8 Impact from Hurricane Michael on Econfina Creek presents a detailed description of instream and upland impacts caused by Hurricane Michael.
  - The authors carefully considered how the impacts of Hurricane Michael may have altered or changed the Middle Econfina Creek study area’s hydrologic regime and highlighted this where appropriate in other sections of the document.
- 2.9 Natural Resources discusses the natural resource values of the Middle Econfina Creek study area.
  - The authors consideration the study areas natural resource values is well thought out and clearly stated.
- 2.10 Recreation discusses the recreation values of the Middle Econfina Creek study area.
  - The authors consideration the study areas recreation values is well thought out and clearly stated.
- Section 3 (Hydrology) presents a detailed evaluation of hydrological characteristics of Econfina Creek and its springs as well as a summary of the District’s hydrologic data collection along Econfina Creek.
  - 3.1 Hydrologic Data Collection discuss the NFWFMD and USGS stream, spring, and groundwater gauging stations of the Middle Econfina Creek study area.
    - The authors are using the best available information and discuss all the information in the Middle Econfina Creek study area. The gauging of the Middle Econfina Creek study area is quite dense which eliminated many assumptions typically used in many hydrologic studies.
  - 3.2 Econfina Creek Discharge describes Econfina Creek flow at four surface water stations.
    - The authors are using the best available information, and the flow frequency curve analysis was appropriate, reasonable, and readily reproduceable.
  - 3.3 Econfina Creek Spring Discharge describes discharge for first and second magnitude springs located along Econfina Creek.
    - The authors are using the best available information, and the flow frequency curve analysis was appropriate, reasonable, and readily reproduceable.
    - Table 3-6 is unable to be reproduced based on the information available in the report. Table 3-4 identifies median flows for Williford Spring Group (42 cfs) and Sylvan Spring Group (18 cfs), and the sum is 60 cfs. Combined Williford, Sylvan, and Econfina Blue spring groups median flow is provided as 74 cfs. Where did the additional 14 cfs come from? Was it Blue Spring? A summary of Blue Spring flow is not presented in table 3-4 and Blue Spring is mentioned only in passing in section 3.1.
  - 3.4 and 3.5 Hydrologic Evaluation for USGS Station 2359500 Econfina Creek Near Bennett, FL and Hydrologic Evaluation for NFWFMD Station 8458 Econfina Creek @SR 20 present a detailed hydrologic evaluation to determine the relationship between observed changes in flow and stage with changes in climatic conditions and groundwater levels in the vicinity of Econfina Creek.
    - The authors used customary, appropriate, reasonable, and reproducible flow data summary procedures to reduce daily flow data noise to determine baseflow, monthly average flow, annual average flow, and test for trends in the flow data. The various conclusions within the section, most importantly “baseflow, derived primarily from spring discharge in the middle reaches of Econfina Creek, accounts for the majority of flow in Econfina Creek under low- to moderate-flow conditions” and “fluctuations in baseflow are consistent with fluctuations in cumulative rainfall” is supported by the data and associated analyses.
    - Figure 3-7 Baseflow Econfina Creek @ CR388 timeseries is different (in 2019) than what is plotted in previous figures (i.e. Figure 3-6 and figure 3-4).
    - Figure 3-14 Baseflow Econfina Creek @ SR20 timeseries appears different (in 2022) than what is plotted in previous figure (i.e. Figure 3-12)

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#### Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- 3.6 Gainer Spring Group Discharge Trends presents a detailed evaluation to assess trends in the Gainer Spring Group discharge data.
  - The authors used customary, appropriate, reasonable, and reproducible spring flow data summary procedures. The conclusion “the observed increase in spring discharge is likely due to increased precipitation” is supported by the data and associated analyses.
- 3.7 Groundwater Withdrawals and Considerations for Baseline Flow Records presents a summary of groundwater withdrawals in Washington and Bay counties and within the Middle Econfina Creek GWCA.
  - The authors clearly stated the information, and the best available and most up to date information is being used. The authors used correctly applied the available data to the study area and the limitations and imprecision in the available data were reasonably handled by maintaining a high degree of conservativeness.
  - The estimates in table 3-10, table 3-12, table 3-13, and table 3-14 are reasonable so long as the GWCA shapefile (see comments for section 2.3 and 2.4) was appropriate for use in this study.
- Section 4 (Water Resource Values) describes the consideration of 10 water resource values defined in Rule 62-40.473, Florida Administrative Code, as they relate to the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group MFL evaluation, and the associated metrics used to quantify the potential effects of reduced spring flows.
  - Recreation In and On the Water
    - The Middle Econfina Creek study area provides extensive recreational opportunities including boating, swimming, tubing, and fishing.
      - Using a minimum water depth of 2.0 ft. across a continuous channel width of 30 ft to evaluate safe boat passage below the SR 20 bridge is an appropriate metric for the study area.
      - Using a minimum water depth of 2.0 ft. across a continuous channel width of 15 ft to evaluate safe boat passage above the SR 20 bridge is an appropriate, but highly conservative, metric for the study area.
      - Using a minimum thalweg depth of 1.5 ft. for safe canoe/kayak passage is an appropriate metric for the study area.
  - Fish and Wildlife Habitat and the Passage of Fish
    - The Middle Econfina Creek study area provides habitat to numerous recreationally important fish species with largemouth bass being the native fish species capable of reaching the largest body depth. Middle Econfina Creek study area provides habitat for numerous aquatic species.
      - Using a minimum thalweg depth of 0.6 ft. for safe fish passage is an appropriate metric for the study area.
      - Using System for Environmental Flow Analysis (SEFA) software and predicting the amount of available habitat (Area Weighted Suitability (AWS)) is appropriate for the study area.
  - Estuarine Resources
    - Due to the Deer Point Lake Reservoir estuarine conditions are not present within the Middle Econfina Creek study area and it is appropriate to not consider this WRV.
  - Transfer of Detrital Material
    - Little quantifiable data is available regarding the transport of detrital material in Econfina Creek or its relationship to flow characteristics. Using frequency of out-of-bank flows as a function of streamflow as a proxy for detrital material is appropriate for the study area.

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Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”

- Maintenance of Freshwater Storage and Supply
  - Maintaining long-term freshwater storage for non-consumptive uses and environmental resources is the prime objective for establishing a MFL flow regime. Considering the frequency of out-of-bank flows as a function of streamflow as a proxy for maintaining long-term freshwater storage is appropriate for the study area.
- Aesthetic and Scenic Attributes
  - Aesthetic and scenic attributes refer to passive uses of the river such as nature viewing, hiking, and photography. These uses are one of the main reasons for the popularity of Econfina Creek for recreational uses. The vegetation (instream and riparian) and wildlife are addressed under WRV2 Fish and Wildlife Habitats and the Passage of Fish. Therefore, protection of this WRV is incorporated in metrics pertaining to Recreation and Fish and Wildlife Habitats. It is appropriate to not directly consider this WRV for the study area.
- Filtration and Absorption of Nutrients and Other Pollutants
  - Information concerning the filtration and absorption of nutrients and other pollutants is currently unavailable for Econfina Creek. As a result, this WRV was unable to be associated with a directly quantifiable metric. Using frequency of out-of-bank flows as a function of streamflow as a proxy for filtration and absorption of nutrients and other pollutants is appropriate for the study area.
- Sediment Loads
  - Information concerning sediment size and transport downstream is currently unavailable for Econfina Creek. As a result, this WRV was unable to be quantified. Using frequency of out-of-bank flows as a function of streamflow as a proxy for sediment loads is appropriate for the study area.
- Water Quality
  - Levels of nitrate at Gainer Spring Group are relatively low, with an average concentration of 0.20 mg/L. Average specific conductance at Gainer Spring was 136 uS/cm indicating minimal salinity impacts. Neither parameter has a statistically significant relationship with spring flow or stream flow. Additionally, due to the extensive efforts by the District to protect Econfina Creek watershed through land acquisition coupled with minimal projected growth in the area, water quality is not anticipated to be of concern for this system. It is appropriate to not directly consider this WRV for the study area.
- Navigation
  - The District has defined this WRV as the navigation of commercial vessels within the study area. Econfina Creek is not used for commercial navigation. It is appropriate to not directly consider this WRV for the study area.
- Selection of Water Resource Values and Associated Metrics
  - The water quality WRV is not listed in 4.11 Selection of Water Resource Values and Associated Metrics. 4.9 Water Quality states metrics pertaining to water quality were not utilized in the MFL determination. Water Quality ought to be added to the “not relevant section.”

**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

- Section 5 (Hydrologic Models) briefly describes the development of hydrologic models utilized to evaluate water resource value metrics and determine minimum flows. Modeling reports are provided as Appendix A and B of this document
  - 5.1 HEC-RAS Model Development and Calibration
    - The authors did a good job of providing a very clear and high-level overview and condensing a 44-page modeling report to less than 8 pages of figures and text.
    - The authors applied HEC-RAS standard modeling practices and used the best available data to develop cross sections (i.e. high-resolution digital elevation model, recent cross-sectional survey data, surveyed bridge dimensions, and replacement of digital elevation model elevations within the channel with survey data). Collecting additional survey cross section data eliminated using assumptions usually applied to the development of HEC-RAS models.
    - The authors used the best available data to determine flow inputs (i.e. hydrologic data from all available stations along Econfina Creek) and eliminated typical HEC-RAS assumption associated with flow due to the dense gauging network.
    - The authors applied HEC-RAS standard modeling practices to calibrate the model (i.e. adjusting channel and floodplain roughness coefficients, including additional of interpolated cross sections to improve model stability near bridge crossings, adjusting ineffective flow areas, and modifying channel cross-section geometry).
    - The HEC-RAS model performance and goodness of fit figures and statistics showed a tight relationship between simulated and observed measurements meaning the model is well calibrated and suitable for use to evaluate water resource value metrics and determine minimum flows in the Middle Econfina Creek study area.
  - 5.2 SEFA Model
    - The authors did a good job of providing a very clear and high-level overview and condensing a 39-page modeling report to less than 2 pages of figures and text.
    - The authors used the best available data and information to couple the hydraulic model with habitat suitability relationships for specific classes of species to determine relationships between streamflow and available habitat.
    - Table 5-3 does not contain an entry for black banded darter however Appendix A of Econfina SEFA Task 4 December 9.docx presents habitat suitability curves for black banded darter and black banded darter is a documented species to occur in Econfina creek.
- Section 6 (Evaluation of Water Resource Values) provides the evaluation of the applicable water resource value metrics utilizing hydrologic models to quantify the effects of potential spring flow reductions.
  - 6.1 Passage (Low Flow) Metrics Evaluation
    - The authors clearly and concisely stated how the HEC-RAS model was used to assess canoe/kayak passage, power boat passage, and fish passage within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproduceable.
    - The authors conclusion “safe canoe and kayak passage was possible at all river transects evaluated in the study area under all flow scenarios” was supported by the analysis and data.
    - The authors conclusion “for all but three transects assessed, safe power boat passage was possible under all flow scenarios, including all transects below Gainer Spring Group” was supported by the data.
    - The authors calculated allowable flow reduction of 92 cfs (21.92%) was fully supported by the data, transparent, defensible, and reproduceable.
    - The authors conclusion “safe fish passage was possible at all transects evaluated in the study area under all flow scenarios” was supported by the data.

**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

- 6.2 Bankfull and Out-of-Bank Flow Evaluation
  - The authors clearly and concisely stated how the HEC-RAS model was used to assess bankfull and of out-of-bank flows within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproducible.
  - The authors evaluation of wetter perimeter in two stages (i.e. above and below XS 6361) is appropriate for the Econfina MFL study area.
  - The authors calculated allowable flow reduction of 69 cfs based on weighted wetted perimeter was fully supported by the data, transparent, defensible, and reproducible.
- 6.3 Evaluation of In Stream Habitat
  - The authors clearly and concisely stated how the SEFA model was used to assess in stream habitat within the Econfina MFL study area. The approach taken by the authors is scientifically sound, defensible, and reproducible.
  - The authors calculated allowable flow reduction of 51 cfs based on the slow shallow guild taxa, which is a common taxa in the Econfina MFL study area, was fully supported by the data, transparent, defensible, and reproducible.
- Section 7 (Summary and Recommended Minimum Flows) provides the recommended minimum flow regimes for middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.
  - The authors appropriately summarized the body of work used to produce the minimum flow. The conclusions drawn in this section match the conclusion drawn in the specific sections provided earlier in the report. All of the conclusion were well supported, reasonable, defensible, and reproducible by the analysis and data in those sections.
  - The authors recommended minimum flow of an allowable flow reduction of 51 cfs from the Econfina Creek @ CR 388 gauge average baseline flow of 537 cfs is protective for Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group. based on the body of work presented in this report.

Overall, it is abundantly clear that the authors took great care in developing the Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group MFL. The author’s approach is clearly stated, the best available data has been used, assumption were identified and minimized to the best extent possible, and all conclusions were supported by the data and analysis. Models developed to support the MFL followed standard modeling practices and were well calibrated and the models were utilized in a practical way. The authors final recommended minimum flow of an allowable flow reduction of 51 cfs is protective for Middle Econfina Creek, including the Gainer Spring Group, Williford Spring Group, and Sylvan Spring Group.

## **Review of supporting appendices**

### **Econfina Creek HEC-RAS technical report 112224.docx**

- Section 1 (Introduction and Model Domain) describes the objective, background, conceptual approach, as well as a short description of the study area.
  - The objective, background, and conceptual approach are clearly stated, well defined, and supported well in the remaining sections of the document.
- Section 2 (HEC-RAS Model Development) documents data sources and discusses how data were utilized to develop the HEC-RAS model.
  - 2.1 Geoprocessing, Projection System, and Digital Elevation Model
    - The authors took appropriate steps to ensure that all data used a consistent spatial reference system and used appropriate conversion factors when necessary.
  - 2.2 Model initialization and digitization



**Review of “Recommended Minimum Flows for Gainer, Sylvan, and Williford Spring Groups, Washington and Bay Counties, Florida”**

to the impacts of Hurricane Michael. The authors conclusion “stage-discharge relationship upon completion of debris removal in the Econfina Creek channel similar to historical” is supported by the data and analysis.

- 3.2 Model calibration locations and targets
  - The authors selection of calibration stations and period of record for calibration is reasonable and justified based on the available data.
- 3.3 Initial model simulation
  - The authors providing the results of the initial model simulation appropriately justifies the authors need to revise the model to increase model performance. The authors conclusion “initial Manning’s n values were likely too high, additional conveyance needed to be added, and model geometry at all transects needed to be reviewed to ensure accuracy and consistency” is supported by the initial model results data.
- 3.4 Calibration Parameter Adjustments and Model Performance
  - The authors clearly and thoroughly discussed their thought processes and the approaches they took to calibrate the model and increase model performance. The authors used customary H&H modeling techniques and the approaches they took are scientifically sound and defensible.
  - The HEC-RAS model performance and goodness of fit shows a tight relationship between simulated and observed measurements meaning the model is well calibrated and suitable for use to evaluate water resource value metrics and determine minimum flows in the Middle Econfina Creek study area.
  - The authors final calibrated values of Mannings N are reasonable and are within literature ranges.

### Econfina SEFA Task 4 December 9.docx

- Section 1 (INTRODUCTION) describes the objective, background, and conceptual approach.
  - The objective, background, and conceptual approach are clearly stated and well defined.
    - Typo page 2, taxon/lie stage should be taxon/life stage
- Section 2 (ECONFINA CREEK – GENERAL DESCRIPTION) provides a brief overview of the Econfina Creek watershed study area.
  - Page 3 states “Econfina Creek itself has a surface water basin covering 275 square miles (~176,000 acres), however the draft technical assessment on page 26, section 2.1, paragraph 1 states “Econfina Creek watershed is approximately 188 square miles.” Which one is correct? Please ensure that the descriptions match between the documents.
  - Page 3 states “This 41,363-acre watershed in Washington and Bay counties runs 14 miles along the course of Econfina Creek.” What watershed is 41,363? What is 14 miles long? The draft technical assessment and HEC-RAS report state the study area is the 11.8-mile portion of Econfina Creek between Williford Spring and Deer Point Lake. Please ensure that the descriptions match between the documents.
- Section 3 (DATA SOURCES) documents data source and discusses how data were utilized to develop the HEC-RAS model.
  - Table 2 does not match table 2-6 and table 2-7 in the draft technical assessment. Table 2 omits American eel and Grass carp from the draft technical assessment table 2-6 and Gulf Spike, Rayed Creekshell, Iridescent Lilliput, Southern Rainbow, and Little Spectaclecase from the draft technical assessment table 2-7. It is not documented why all species identified in the draft technical assessment are not considered in the SEFA modeling.
  - Table 3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.

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- Comparing table 4 in the SEFA report to table 2-3 in the HEC-RAS report shows that Table 4 is 1.8 cfs greater. As described in section 5.2 of the main report this is due to the adjustment of +1.78 cfs (representative of total 2020 groundwater withdrawals within the Econfina GWCA). For complete transparency, flow adjustments ought to be discussed in the SEFA report since this adjustment for scenario modeling is not mentioned in the HEC-RAS report but the HEC-RAS model is documented as the source for the flows in table 4.
- Section 5 (APPLICATION OF SEFA RESULTS TO DEVELOPMENT OF THE MFL FOR ECONFINA CREEK)
  - The authors clearly and concisely described how SEFA model results are interpreted for use in determining the MFL.

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Counties, Florida”**



Comment No.	Figure, Table, or Page and Paragraph No.	Does Comment Directly and Materially Affect Conclusions of Report? (Yes or No)	Specific Comments	Specific recommended Corrective Action
1	Draft_techassess_Econfina_250131.docx Page 22 Paragraph 1	No	typo	change ofEconfina to of Econfina
2	Draft_techassess_Econfina_250131.docx figures 2-9, 2-10, 2-11, and 2-12	Yes	source of the Groundwater contributing area to the Gainer-Sylvan-Williford group of springs polygon used in listed figures is unclear	Clarify source in text and figures and/or discuss development of polygon
3	Draft_techassess_Econfina_250131.docx Table 3-6	No	Table 3-6 is unable to be reproduced based on the information available in the report. Williford Spring Group (42 cfs) and Sylvan Spring Group (18 cfs). Combined Williford, Sylvan, and Econfina Blue spring groups median flow is provided as 74 cfs. Where did the additional 14 cfs come from? Was it Blue Spring? A summary of Blue Spring flow is not presented in table 3-4 and Blue Spring is mentioned only in passing in section 3.1	Provide details in the report about Blue Spring and discuss the data availability for Blue Spring. Add Blue Spring flow summary statistics to Table 3-4. Alternatively, could update Table 3-6 to match information as provided.
4	Draft_techassess_Econfina_250131.docx Figure 3-7	No	Baseflow Econfina Creek @ CR388 timeseries is different (2019) than what is plotted in previous figures (i.e. Figure 3-6 and figure 3-4).	Plot correct timeseries in Figure 3-7. Redo linear regression between baseflow and groundwater levels (Figure 3-8) and update text below Figure 3-6.
5	Draft_techassess_Econfina_250131.docx Figure 3-14	No	Baseflow Econfina Creek @ SR20 timeseries appears different (2022) than what is plotted in previous figure (i.e. Figure 3-12).	Plot correct timeseries in Figure 3-15. Redo linear regression between baseflow and groundwater levels Figure 3-8 and update text below Figure 3-13.
6	Draft_techassess_Econfina_250131.docx table 3-10, table 3-12, table 3-13, and table 3-14	Yes	estimates in table 3-10, table 3-12, table 3-13, and table 3-14 are reasonable so long as the GWCA shapefile (see comments for section 2.3 and 2.4) was appropriate for use in this study	Clarify source of GWCA shapefile in text and figures and/or discuss development of polygon to build confidence that the correct GWCA is being used to calculate the impact of groundwater withdrawals.
7	Draft_techassess_Econfina_250131.docx 4.11 Selection of Water Resource Values and Associated Metrics, pg102	No	Water quality WRV is not listed in 4.11. Section 4.9 Water Quality states metrics pertaining to water quality were not utilized in the MFL determination.	Water Quality ought to be added to the “not relevant section.”
8	Draft_techassess_Econfina_250131.docx 5.2 SEFA Model, pg112	No	Table 5-3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.	Review and update table 5-3 for completeness.
9	Econfina SEFA Task 4 December 9.docx pg2	No	Typo	taxon/lie stage should be taxon/life stage

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10	Econfina SEFA Task 4 December 9.docx pg3	No	Page 3 states “Econfina Creek itself has a surface water basin covering 275 square miles (~176,000 acres), however the draft technical assessment on page 26, section 2.1, paragraph 1 states “Econfina Creek watershed is approximately 188 square miles.” Which one is correct?	ensure that the descriptions match between the documents.
11	Econfina SEFA Task 4 December 9.docx pg3	No	Page 3 states “This 41,363-acre watershed in Washington and Bay counties runs 14 miles along the course of Econfina Creek.” What watershed is 41,363? What is 14 miles long? The draft technical assessment and HEC-RAS report state the study area is the 11.8-mile portion of Econfina Creek between Williford Spring and Deer Point Lake.	ensure that the descriptions match between the documents.
12	Econfina SEFA Task 4 December 9.docx Table 2	No	Table 2 does not match table 2-6 and table 2-7 in the draft technical assessment. Table 2 omits American eel and Grass carp from the draft technical assessment table 2-6 and Gulf Spike, Rayed Creekshell, Iridescent Lilliput, Southern Rainbow, and Little Spectaclecase from the draft technical assessment table 2-7. It is not documented why all species identified in the draft technical assessment are not considered in the SEFA modeling.	Review table to ensure completeness
13	Econfina SEFA Task 4 December 9.docx Table 3	No	Table 3 does not contain an entry for black banded darter however Appendix A presents habitat suitability curves for black banded darter and black banded darter and black banded darter is a documented species to occur in Econfina creek.	Review table to ensure completeness
14	Econfina SEFA Task 4 December 9.docx Table 4	Np	Comparing table 4 in the SEFA report to table 2-3 in the HEC-RAS report shows that Table 4 is 1.8 cfs greater. As described in section 5.2 of the main report this is due to the adjustment of +1.78 cfs (representative of total 2020 groundwater withdrawals within the Econfina GWCA).	For complete transparency, flow adjustments ought to be discuss in the SEFA report since this adjustment for scenario modeling is not mentioned in the HEC-RAS report but the HEC-RAS model is documented as the source for the flows in table 4.