

ATTACHMENT A — STATEMENT OF WORK
INDEPENDENT TECHNICAL PEER REVIEW SERVICES
CRYSTAL LAKE HSPF MODEL
DEVELOPMENT, DOCUMENTATION, AND LONG-TERM SIMULATION REVIEW

I. INTRODUCTION/BACKGROUND

The St. Johns River Water Management District (District), as mandated by state water policy, is engaged in a District-wide effort to establish MFLs for priority lakes, streams and rivers, wetlands, springs, and groundwater aquifers. MFLs designate the minimum hydrologic conditions that must be maintained in these water resources to prevent significant harm resulting from permitted water withdrawals.

East Crystal Lake and West Crystal Lake are part of the Crystal Chain of Lakes (CCL). The CCL also includes Bel-Air Lake, Deforest Lake, and Armory Lake. These lakes are located four miles southwest of the City of Sanford in Seminole County, Florida. The peer review services described herein will support the development of minimum levels for Crystal Lake. These lakes primarily receive water from direct precipitation, surface runoff, and base flow, and lose their water through evaporation and seepage to the Upper Floridan Aquifer (UFA).

District staff developed a continuous simulation hydrological model for the CCL using Hydrological Simulation Program – FORTTRAN (HSPF). The HSPF model was set up for the period 1995 to 2019 and then calibrated and validated for the periods 2007 to 2019 and 1995 to 2006, respectively.

Once successfully calibrated and validated, the model was extended to the period from 1953 to 2019 for long-term simulations. Long-term simulations are important because MFLs assessments often require frequency analysis of lake levels. Due to the presence of short- and long-term climatic cycles (e.g. El Nino Southern and Atlantic Multidecadal Oscillations), the frequencies of lake levels could be significantly different in wet periods such as in the 1960s than dry periods such as in the 2000s. Thus, it is important to perform frequency analysis using long-term lake levels so that the effect of short- and long-term climatic variations on lake levels can be captured. Although observed long-term lake levels are available, the data is usually discontinuous and sometimes sparse. A complete MFLs analysis includes developing a long-term simulation model, simulating no-pumping (pre-withdrawal) and current-pumping condition lake levels and typically performing frequency analysis to assess the current and future status of the MFLs. Review of this HSPF model will occur as part of the comprehensive Central Florida Water Initiative (CFWI) peer review process.

II. OBJECTIVES

Dynamic Solutions, LLC (Consultant) shall provide the District with the services of an independent technical peer review of scientific and technical data, methodologies, and assumptions related to the development and application of the CCL HSPF model including long-term simulations for the determination and/or assessment of MFLs.

In the event of civil or administrative litigation in which the subject matter of the model and report are relevant, Consultant agrees that he/she will make himself/herself available during the period of such litigation as an expert witness under the direction of the District's Office of General Counsel or such other counsel as the District may employ. The District may designate Consultant as a testifying or non-testifying expert and may assert the attorney work product privilege as to the research and report during the period of such litigation. This task, if required, will be completed under a separate work order or contract and shall include coordination and cooperation with the District's Office of General Counsel.

III. SCOPE

Consultant shall review and assess the appropriateness of all scientific and technical data, specific model or relationships applied, model methodologies and analyses, and model assumptions associated with the development, calibration, and long-term simulations of the HSPF model. Consultant shall conduct a thorough review of the HSPF model and the associated report and other files, to assess the following:

- Adequacy and appropriateness of the data used in model development, calibration, and long-term simulations
- Validity, defensibility and appropriateness of the development, calibration, and long-term simulations of the model
- Deficiencies, errors, or areas for improvements in model development, calibration, and long-term simulations
- Validity and appropriateness of all assumptions in the development of any statistical relationships used for the determination and/or assessment of MFLs

IV. TASK IDENTIFICATION

Consultant shall perform the following tasks to accomplish the Scope of Work described above.

Task A. Attend Project Kick-off Meeting and Site Visit

Consultant shall participate in a project kick-off meeting and site visit to ensure Consultant has the opportunity to observe the hydrologic features being modeled and understand the work assignment, the peer review process, and timeframes. This meeting will be public and part of the CFWI peer review process. The District will notify all involved parties of the dates and times by e-mail.

Deliverable: Consultant shall provide the District a summary of the meeting and site visit, including specific action items for model review and documentation.

Task B. Peer Review CCL HSPF Model and Documentation Report

B.1. Review of Model, Long-term Simulation and Documentation and provide initial comments:

Consultant shall review all scientific and technical data, methodologies, assumptions, and recommendations related to the development and calibration of the CCL HSPF model, long-term simulations, and the following report:

- Minimum levels hydrological modeling for Crystal Chain of Lakes, Seminole County, Florida. Leta, O.T., Y.Jia, and T. Jobes. 2022. Draft St. Johns River Water Management report.

Consultant shall attend a virtual public workshop to share their initial comments and listen to comments from stakeholders. In addition, the Consultant shall read all comments provided by stakeholders and will consider all comments in the Consultant's draft technical memorandum (subtask B.2).

Deliverable: Consultant shall present their initial comments during the virtual public workshop. Consultant shall provide the District a summary of the public workshop.

B.2 Draft Peer Review Technical Memorandum : Consultant shall prepare a draft TM summarizing the findings and recommendations related to the peer review of the CCL HSPF model, long-term simulations and report and other files and submit to the District.

As part of their review process, the Consultant shall provide answers to the following questions in the TM.

- 1) Assess the adequacy and appropriateness of the data used in model development and calibration.
 - a) Was "best information available" utilized to develop and calibrate the HSPF model?
 - b) Are there any deficiencies regarding data availability?
 - c) Was relevant information available that was discarded without appropriate justification?
Would use of discarded information significantly affect results?

- 2) Assess the validity, defensibility and appropriateness of the model development, and calibration.
 - a) Determine if the model is appropriate, defensible, and valid, given the District's MFLs approach.
 - b) Evaluate the validity and appropriateness of all assumptions used in the model development and calibration.
 - Are the assumptions reasonable and consistent given the "best information available"?
 - Is there information available that could have been used to eliminate any of the assumptions? Could the use of this additional information substantially change the models results?
 - c) Review the HSPF model input and output data, including an examination of:
 - Model elevations vs collected data to verify same datum used consistently
 - Flow/stage plots to look for model instabilities
 - Output file for model warnings (full flow channels, flooded nodes, etc.) and flow classification summary
 - Continuity error and convergence data
 - Runoff and infiltration volumes to check for reasonableness
 - Values assigned to model parameters to check for reasonableness
 - Groundwater data use in model inputs
 - Methodologies used to develop input data for long-term simulations
 - Long-term simulation results to check for reasonableness

The development of an independent water budget will be included in this subtask.

Deliverable: Consultant shall prepare a draft TM summarizing their findings and recommendations regarding the CCL HSPF model, long-term simulations and reports and submit to the District. The water budget shall be included in the deliverable.

Task C. Presentation of Final Comments and Final Technical Memorandum

C.1 Peer Review Public Teleconference: Consultant shall attend a public teleconference to share their final comments and listen to comments from stakeholders. In addition, the Consultant shall read all comments provided by stakeholders and will consider all comments in the Consultant's final technical memorandum (subtask C.2).

Deliverable: Consultant shall present their final comments during the public teleconference. Consultant shall provide the District a summary of the public teleconference.

C.2 Final Peer Review Technical Memorandum: Consultant shall prepare a final TM that summarizes their findings and recommendations regarding the CCL HSPF model and report and other files and submit to the District.

Deliverable: Final TM summarizing their findings and recommendations regarding the CCL HSPF model and report.

V. TIME FRAMES AND DELIVERABLES

The expiration date of this Work Order is September 30, 2024. Specific timeframes as they apply to tasks, milestones, deliverables, and teleconferences are included in Table 1.

Table 1. Schedule

Task	Deliverable	Completion Date
A.	Project Kick-off Meeting and Site Visit	December 13, 2023
	Summary of Site Visit and Meeting	December 15, 2023
B.1	Presentation of initial comments	January 10, 2024
	Public Workshop Summary	January 11, 2024
B.2	Draft Technical Memorandum	January 31, 2024
C.1	Presentation of final comments	February 7, 2024
	Public Teleconference Summary	February 9, 2024
C.2	Final Technical Memorandum	February 16, 2024

Consultant shall employ an internal quality review process to ensure only high quality, complete, and correct products are provided to the District. Deliverables prepared by Consultant shall be clear, concise, thorough, and grammatically correct. Consultant shall present data for technical products in a well-organized format. Findings should be based on a logical derivation from the facts and data. Consultant shall provide written confirmation by a principal of the firm that quality assurance procedures were followed prior to release of a given deliverable upon request by the District. References shall be appropriately cited.

Consultant shall assure that all spelling and grammar errors disclosed by the Microsoft Word spelling and grammar check functions, and all tracked edits have been addressed so none are showing in the document when the tracking features and the spelling errors and grammar check are set to show on the computer screen or in the printed document.

Consultant shall submit the complete report in editable digital format, including all graphics and tables integrated with the text of the report. Consultant shall provide the following digital files:

1. A Microsoft Word file of all text and any graphics that may feasibly be incorporated into the document without creating an unwieldy large file or causing printing difficulties. Adobe Acrobat files that are not convertible to Microsoft Word are not acceptable as the sole form of submission for any part of the report except appendices.
2. Separate large files of data, graphics, Geographic Information Systems (GIS) shape files and coverages and any other graphics or other report materials that are not feasible to incorporate into a Microsoft Word document. All files must be in manipulatable formats acceptable to the District.

The District may require non-Word files to be in their native formats. Adobe Acrobat files are not acceptable as the sole form of submission for any graphics, GIS products, data or other materials unless such material cannot be converted into another format.

Electronic submissions must meet the following specifications:

1. Deliverables may be submitted on USB flash drive, through an electronic file transfer portal or by e-mail.
2. Each USB flash drive must have a label including contract name, number, Consultant, submittal date and version.
3. Each USB flash drive or file transfer folder must have an obvious directory structure.
4. A read-me file listing and describing the contents by file name must be included
5. The digital files for the final document (including all graphics, appendixes, tables, peer reviews, etc.) must be in their own folder or e-mail separate from any draft or preliminary versions or data.

All report materials produced for the District under this contract shall become property of the District and may be edited by the District in consultation with Consultant for style, writing quality, and format.

VI. BUDGET/COST SCHEDULE

This Work Order is for a lump sum amount of \$33,785. Consultant shall invoice the District monthly based on a percent complete per task (Table 2). Invoices shall include documentation (progress report) listing work completed and work planned. The cost includes all expenses associated with the Work.

Table 2. Budget

Task	Deliverable	Total Dollars by Task
A.	Project Kick-off Meeting and Site Visit	\$3,167
B.1	Presentation of initial comments Public Workshop Summary	\$13,320
B.2	Draft Technical Memorandum	\$12,758
C.1	Presentation of final comments Public Teleconference Summary	\$1,110
C.2	Final Technical Memorandum	\$3,430
Total Estimated Budget		\$33,785