



Environmental Consulting & Technology, Inc.

TECHNICAL MEMORANDUM

Independent Scientific Peer Review of Minimum Levels Reevaluation For Lake Geneva, Bradford and Clay Counties, Florida. 2013 (Draft)

Prepared for: Sonny Hall, Ph.D., St. Johns River Water Management District (SJRWMD)

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Date: May 24, 2013

PURPOSE

This technical memorandum (TM) summarizes Environmental Consulting & Technology, Inc.'s (ECT's) independent scientific peer review of a draft minimum levels reevaluation for Lake Geneva:

Neubauer, C. P. 2013. Minimum Levels Reevaluation For Lake Geneva, Bradford and Clay Counties, Florida. Technical Publication SJ2013-XX St. Johns River Water Management District. Palatka, Florida.

This TM is ECT's first review of the referenced draft document prepared by C.P. Neubauer of SJRWMD, dated May 17, 2013. The review was conducted according to the peer review criteria specified by SJRWMD under Contract No. 27364. This TM includes both the general review and specific comments.

This assessment addresses the following general review criteria:

- Adequacy of environmental data in terms of quality and length of record.
- Appropriateness of methods and procedures for data analysis.
- Validity and appropriateness of assumptions used in SJRWMD staff's development of minimum flows and levels (MFLs) analysis.
- Sources of uncertainty and impact of uncertainty on SJRWMD staff's development and implementation of proposed MFLs.
- Adequacy of data to support SJRWMD staff's conclusions and recommendations for proposed MFLs.

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GENERAL FINDINGS

The report is logically organized into sections and subsections so that the reader can follow the presentation of the subjects. The text adequately describes quality assurance procedures, and summaries of the environmental and hydrologic data. There are, however, some organization and presentation issues. The report should clearly state, in the front end of the Executive Summary and the Introduction sections, that this study is to reevaluate the currently adopted Lake Geneva MFLs (with a brief description). It is also recommended that the report clearly state the reason that the Lake Geneva MFLs need to be reevaluated and why the newly reevaluated MFLs are technically better than the currently adopted MFLs in both the Executive Summary and the Introduction sections. The development of the minimum infrequent low (MIL) is omitted from the Methods section. The Executive Summary and Introduction could more clearly present the nature and importance of the MIL and minimum infrequent high (MIH) in protecting the ecological functions of sandhill lakes. The reader may be confused by the comprehensive presentation of standard MFLs methods for minimum frequent high (MFH), minimum average (MA), and minimum frequent low (MFL), which occupy much of the text in the Introduction and Methods, followed by a brief exceptions paragraph noting that the actual methods are for MIL and MIH. Some simplification or reduction of the standard text may improve the report.

SPECIFIC COMMENTS

Attachment A presents specific comments on Dr. Neubauer's draft report.

ATTACHMENT A

Independent Scientific Peer Review of Minimum Levels Reevaluation For Lake Geneva, Bradford and Clay Counties, Florida (Draft)

Peer Review Comments – May 24, 2013		
Reviewer	Text Reference	Peer Review Comments
1. Chou	Page iii, paragraph 2, line 1 “The recommended MFLs for Lake Geneva”	Since this is a reevaluation of the adopted MFLs, it would be helpful to briefly describe the adopted MFLs, why they are being reevaluated, and why the “newly recommended MFLs” are technically better than the adopted MFLs.
2. Epting	Executive Summary, page iii, paragraph 4, line 3 “Seasonally flooded wetland plant communities appear to be unstable (i.e., species existed up- or down-slope depending upon high and low water events).”	A fuller explanation of what is meant by “unstable” plant communities would be useful to the reader.
3. Epting	Executive Summary, page iv, paragraph 3, line 3 “... withdrawals of water...”	Is “cumulative ground water pumping” not more descriptive of the principle concern?
4. Epting	Executive Summary, page iv, paragraph 5, line 9 “Thus, protecting the MIH from water withdrawals will protect the MIL.”	It is not clear how this statement follows from the preceding discussion.
5. Chou	Page v, Table ES-1, column heading “Adopted Minimum Levels”	To avoid the confusion between the adopted MFLs and the yet-to-be-adopted MFLs, as mentioned in the last paragraph of page iv, it would be helpful to create a footnote to state when the adopted MFLs were adopted.
6. Epting	Contents, page vi, last two lines	The minimum level table is referenced twice in the table of contents.
7. Epting	Contents, page vii	The table of contents does not list Appendices D or E.
8. Chou	Page 1, paragraph 1, line 3 “Lake Geneva, a large lake”	It is logical to introduce the lake location here (Figure 3).
9. Chou	Page 1, paragraph 2	Since this is a reevaluation of the adopted MFLs, it would be helpful to briefly describe the adopted MFLs, why they are being reevaluated, and why the “newly recommended MFLs” are technically better than the adopted MFLs.

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10. Epting	Introduction, page 2, paragraph 3, line 10 “Alternatively, a MIH level and a MIL level might be sufficient to protect certain sandhill type lakes that may lack stable seasonally flooded wetland communities because of a large range of water level fluctuation (Neubauer et al. 2008).”	Because of the reevaluation of Geneva to MIL and MIH, consider breaking this text out as an expanded separate paragraph.
11. Epting	Introduction, page 3, paragraph 2, line 1 “A fundamental assumption of the SJRWMD MFLs program is that the ecology of a system (e.g., locations of wetland communities and the upland ecotone) is dependent upon hydrology.”	This seems an unnecessary assumption given the body of literature on wetland hydrology and plant community structure. That MFLs embody this relationship would appear more appropriate.
12. Epting	Introduction, page 3, paragraph 2, line 7 “...stable wetland communities, similar to those along the St. Johns river and wetland type lakes (e.g., Lake Dias in Volusia County) do not appear to exist on some lakes (e.g., sandhill type lakes) with very large ranges of fluctuation.”	Because of the reevaluation of Geneva to MIL and MIH, consider breaking this text out as an expanded separate paragraph.
13. Chou	Page 5, paragraph 3, line 2 “Lake Geneva has an approximately 22-ft range of fluctuation ...”	It is logical to introduce the lake level data here (Figure 9).
14. Epting	Introduction, page 5, paragraph 4, line 10 “Determining a minimum frequent high (MFH) level and minimum frequent low (MFL) level to protect seasonally flooded wetlands with unstable species was considered imprudent.”	It is unclear that the subject here is this reevaluation MFLs.
15. Epting	Introduction, page 6, paragraph 1, line 1 “Other portions of the system will be protected from significant ecological harm caused by changes in the hydrology of the lake if these criteria are protected.”	The paragraph does not include the MIL as part of “these criteria.”
16. Epting	Introduction, page 6, paragraph 1	In light of the note that there has been little development along the shoreline, the Crater Lake text adds little additional support for the assumption that the bathymetry is valid today. Consider simplifying.
17. Chou	Page 7, paragraph 2, line 1 “A daily hydrograph based on linear interpolation values ...”	Please describe the data collection frequency, thus the need for interpolation.
18. Epting	Introduction, page 9, Mapped Wetlands Section	The value of summarizing these “mapped” wetlands in a sandhill lake is unclear; consider a clearer labeling of these “unstable” wetlands.

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19. Epting	Introduction, page 11, paragraph 2, line 1 “From a fishery habitat perspective, a minimum infrequent low level might be set to protect the fishery populations during periods of very low water levels.”	Consider recasting this as a positive goal statement rather than “might be.”
20. Chou	Page 17, Figure 6 title	This is a rather lengthy title. The text in parentheses should be footnotes of the figure.
21. Epting	Introduction, page 18, Figure 7 legend “Bathymetric map of Lake Geneva created from digitized contours of Clark et al 1964, when the lake stage was 102.7 ft NGVD”	The figure legend does not include location.
22. Chou	Page 18, Figure 7	The bathymetric contours should have labels. Otherwise, the map is meaningless.
23. Chou	Page 19, Figure 8 title	The notes should be placed as footnotes, not part of the figure title.
24. Epting	Methods, page 24, paragraph 3, line 11 “This elevation is well above the maximum elevations measured or estimated from Lake Geneva and therefore would not be useful for determining minimum lake levels.”	Presumably, minimum infrequent high level is meant here; consider revising.
25. Epting	Methods Section, pages 24 through 29	There appears to be no mention in the methods of MIL development and analysis.
26. Epting	Methods, page 25, paragraph 1, line 3 “Elevations were determined from known benchmarks located at the Keystone Heights City Park or from other benchmarks located near the southeast shore of the eastern lake lobe.”	Specifying the benchmarks identifiers here in the Methods seems more appropriate than considering them a result (see comment No. 31).
27. Chou	Page 26, paragraph 3 “Data Analysis”	This section should be expanded to explain the objective and procedures of the data analysis.
28. Epting	Methods, page 29, paragraph 4, line 1 “Hydrologic modeling of the water body in question is an indispensable part of”	Change indispensable to <i>indispensable</i> .
29. Chou	Page 29, paragraph 4, line 4 “A hydrologic model for Lake Geneva was developed ...”	Please state the name of the model.
30. Epting	Results and Discussion, page 30, paragraph 1, line 8 “...wetlands were not located at fixed elevations...”	“Stable” is the term used elsewhere when describing these wetlands.
31. Epting	Results and Discussion, page 30, Field Data Collection Section	The first paragraph of this section, describing site locations, staff, benchmarks, etc., is more appropriately considered Methods.

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32. Epting	Results and Discussion, page 30, paragraph 2, line 5 “The MFLs elevation components will be converted to ft NAVD in the final report. These converted values will be included in the MFLs summary tables at a later date.”	The contents of Tables ES-1 and 5 indicate that this conversion has been done.
33. Epting	Results and Discussion, page 32, paragraph 4, line 1 “Some further general narrative is presented below relative the ten WRVs and the numerical ratings in Table 1.”	The purpose of the general text narrative is unclear when these points are nicely summarized in Table 4.
34. Chou	Page 34, paragraph 3, line 12 “It is not known why SJRWMD and DEP have differing assessments of water quality conditions ...”	This sentence may be unnecessary. There may have been complex reasons for the differing assessments, but unknown to the author. The inclusion of this statement creates unnecessary conflict, which may weaken the assessment.
35. Chou	Page 35, paragraph 2, line 9 “However, the coliforms counts are considered typical.”	Recommend deleting the word “However.”
36. Chou	Page 37, paragraph 2, line 1 “Timing of these modifications appears to precede the collection of stage data.”	It would be helpful to state the approximate time of the modification (e.g., prior to 1960).
37. Chou	Page 37, paragraph 3, line 1 “Recommended, minimum levels ...”	Recommend deleting the comma.
38. Chou	Page 40, paragraph 2, line 1 “This recommended event ...”	Consider editing to read, “The recommended duration of this critical event ...”
39. Epting	Results and Discussion, page 40, paragraph 2, line 4 “The upland ecotone will likely not move down slope if this event recurs frequently enough.”	The preceding and following discussion would appear to make this assumption unnecessary.
40. Epting	Results and Discussion, page 40, legend Table 2 title “Comparison of potential return intervals, numbers of events per century on average, and increase in the number of years that would occur with reduced numbers of flooding events (106.3 ft, 120-day duration). (NA = not applicable)”	The title does not reference Lake Geneva.
41. Chou	Page 40, Table 2 title “(NA = not applicable)”	Recommend placing this as a footnote instead of being part of the table title, or simply spell out “not applicable,” because there is sufficient space for that. Also, please explain why it is not applicable.

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42. Epting	Results and Discussion, page 42, paragraph 1, line 2 “Specifically, withdrawals should not result in reduced chances that anglers can catch trophy size (i.e., ≥ 10 lbs) largemouth bass.”	This criterion appears inconsistent with that of protecting habitat refugia for the fish population.
43. Chou	Page 43, paragraph 4	This table, presumably Table 3, needs a table number and a title.
44. Epting	Results and Discussion, page 43, Table 3 title “Shows the dates, decline in stage, number of days stage declines occurred, and calculated decline per day for three recent low water periods. The maximum rate of decline would result in greater than 8 ft of fish habitat if the daily declines occurred for one year.”	The title does not reference Lake Geneva.
45. Epting	Results and Discussion, page 44, paragraph 2, line 7 “This return interval would allow “trophy size” largemouth bass to exist in the lake.”	A discussion of fish population recovery would appear more relevant, given that, “[t]he specific indicator of protection is a low water level that provides for fish habitat...” (page 42).
46. Epting	Results and Discussion, page 45, Table 4 title “Consideration of Rule 62-40.473, F.A.C., environmental values for Lake Geneva”	The title does not include a location reference.
47. Epting	Conclusions and Recommendations, page 49, paragraph 1, line 3 “SJRWMD’s multiple MFLs methodology (SJRWMD 2006, Neubauer et. al. 2008) was used to develop the recommended MFLs for Lake Geneva.”	The conclusions section does not mention that the recommended levels are MIL and MIH, consistent with the sandhill character of Lake Geneva.
48. Chou	Page 50, Table 5 “Adopted Minimum Levels”	Recommend creating a footnote to state the year when the MFLs were adopted.
49. Epting	Literature Cited, page 54, 4 th citation “Lake Area Monitor”	The citation appears incomplete.
50. Epting	Appendix A, page 57	The appendix would be a useful addition to the Minimum Flows and Levels Methods Manual.
51. Epting	Appendix A, page 57, and following	The page headers for several appendices do not correspond to the appendix labels: Appendix A is headed Appendix C, and Appendices B, C, and E are headed Appendix D.
52. Chou	Page 64, Figure	This figure needs a figure number and title (Figure C1).
53. Chou	Page 69, Figure C6	Some content of this rather long figure title should be placed in the footnotes.

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54.	Chou	Page 70, Figure C7	Some content of this rather long figure title should be placed in the footnotes.
55.	Chou	Page 72, Figure C9	Some content of this rather long figure title should be placed in the footnotes.
56.	Chou	Page 84	The relationship between the water depth and NGVD datum is needed. What was the water depth at the 102.7-ft-msl contour?
57.	Epting	Appendices Section, page 89	Page 89 is blank and should be deleted or labeled as intended blank.