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To: Sonny Hall, St. Johns River Water Management District [SJRWMD]  
From: Lee Wilson, Ph.D.  
Date: June 19, 2013  
Re: Minimum Levels Reevaluation for Lake Brooklyn, Bradford and Clay Counties,  
Florida

This document reflects my ongoing assignment from SJRWMD to review reports related to MFLs development for water bodies within the District. The subject report, for Lake Brooklyn, was authored by Cliff Neubauer. Dr. Neubauer adopted an approach he considers suitable for lakes that lack stable relationships between plant communities, topography, soils and hydrology. My review considers overall methodology, data, methods and assumptions used by the author, the resulting recommended MFLs, and the overall organization and presentation of the report.

My specific introductory comments on this report are the same as for Lake Geneva, which was also authored by Dr. Neubauer. In particular, I do not consider the recommended MFLs are ready for adoption, but otherwise commend the professionalism of the report. I have

incorporated some of my Lake Geneva comments by reference, since I know Dr. Neubauer will see my memo on that report.

### Primary comments

1. The report needs a discussion of the ecology that will result from the future hydrology that will exist with the increased consumptive use allowed by the recommended MFLs.
2. The drying effect seen at Lake Geneva is much less prominent here. Nonetheless, I am concerned that given the current state of the lake, readers (protestants) will need to be informed about the effects of future climate change.
3. My discussion of “no net loss” for Geneva applies here as well.
4. The saw palmetto discussion is a bit stronger for this lake than for Lake Geneva, and some past encroachment is suggested, but overall I don’t see concluding that minor encroachment means significant harm to a lake that is currently almost gone.
5. The MIL is not supported by any discussion of the existing fishery. The MIL is so far below an already disappeared lake that proposing it will impair the credibility of the SJRWMD MFLs approach.
6. As I discussed for Lake Geneva, aesthetics and lobe connections should be revisited as a basis to set MFLs. The fact that a periodic MIH (or an MA) results in a real lake is important. The MIL should not allow conditions to be worse than they are now.
7. I expect to revisit these issues further when I review Lake Cowpen. In general I thought the prior 2011 report for Lake Cowpen handled some of the Lake Brooklyn issues better.
8. For me the bottom line is evidenced by looking at the 2013 Google earth photo of Lake Brooklyn -- the lake is mostly gone. I anticipate serious credibility issues (in court, at public meetings, in the press) when the District tries to defend “it is okay to adopt MFLs that will allow this lake to dry up even more”.

### Editorial comments

9. Executive summary and text could indicate that there are already MFLs for this lake.
10. P. iii and elsewhere. Referring to Lake Brooklyn as “large” will generate push back given how puny the lake is at the moment. If you must use this word, please explain it.

11. P. iv, first full paragraph. In last sentence, the words “caused by water withdrawals” do not follow “significant harm”, which is in contrast to the Lake Geneva report.
12. P. iv. the last paragraph is a summary of material that is not contained in the report. Seems important.
13. P. vi. Delete NAVD column or add footnote to explain that in time the MFLs will be restated in NAVD.
14. P. 1. Should be numbered consistent with table of contents.
15. P. 2. Really p. 1.
16. P. 3. The Brooklyn report is a considerable improvement in explaining the MFLs concept. As suggested in my Lake Geneva comments, I recommend Jodi Slater’s 2013 Lake Norris MFLs report (and my comments on same) for additional ways to make even more improvement.
17. P. 4. The “fundamental assumption” that ecology depends on hydrology is very well explained, but in the report is not demonstrated to be strongly indicated by this system. There needs to be some ecological shrinkage that qualifies as significant harm and would be caused by a changed flooding regime.
18. P. 4. The first full paragraph is an example of a fundamental discussion that probably needs to be earlier.
19. P. 7. All maps and air photos of this lake make it obvious that the lobe structure is a critical characteristic. The report provides relatively little discussion of the lobes, was a bit confusing on nomenclature, and most important did not discuss how and when the lobes connect, and why that is or isn’t important.
20. P. 7. I’m not sure the discussion of Crater Lake adds much. Referring to a “deepest point is located in a northwest lobe” is an example of a lobe nomenclature problem (i.e. it is imprecise).
21. P. 8. I think of “fluctuations” as the amplitude between high and low cycles, not the amplitude of the lake level change after multiple cycles. For this lake, fluctuations as I think of them are typically less than 20 feet.
22. P. 9, paragraph that begins “Notably”. Why are you more certain here than at Geneva about the effect of fluctuations on wetlands (here effects are “likely”, for Geneva the effects “might” happen)?
23. P. 9. If I understand the soils discussion, the presence of hydric soils is pretty much meaningless, but the absence of deep organic soils is dispositive. Not sure the nuances of this distinction come across. In any event, I don’t agree with the decision to leave out the results of the field soil sampling. Those results need to be presented to allow independent review. I recommend at least an appendix with the results.

24. P. 11. In the Lake Geneva report, there was a discussion of the bass fishery at this location in the document. Fishery resources are never discussed in the Brooklyn report. Without such a discussion, I don't see how the MIL can even be proposed. [Note, adding a section similar to Geneva won't fix the problem, as the discussion there did not support an MIL based on fishing.]
25. P. 14. For Figure 3 and others, the map itself refers only to Clay County.
26. P. 15. Interesting that a lake that permanently seeps has lower recharge than uplands that get periodic rainfall. Is this relationship strongly supported?
27. P. 17. I was confused by the arrows on Figure 6.
28. P. 18. Not too useful without contour values.
29. P. 19. Arrows would be useful on Figure 8.
30. P. 25. I don't follow the logic in "soils sampling procedures". It reads like a Catch 22: no deep soils to support something other than an MIH or MIL were found because no soils were sampled because no soils were expected because only an MIH and MIL were considered because something other than an MIH and MIL was assumed to be not supported. Need to state clearly your basis for certainty that there are no organic soils.
31. P. 25. Cowpen report did quite well with no discussion of SWIDs. Not sure they really matter in a lake like this.
32. P. 28. I didn't find anything in the body of the report that made real use of the "basin alterations" background. The subsequent discussion of Structural Alterations pretty much stands on its own.
33. P. 30. Here and elsewhere there is unexpected yellow highlighting on my copy.
34. P. 33. In Table 1, I'm not clear how the matrix identifies "most limiting" rather than "most important". Also, there are several "2" ratings in the first column, even though this lake apparently has no meaningful wetland functions.
35. P. 35. "That is, withdrawals should not cause a net downhill shift in uplands and result in a loss of lake area". Why, exactly?
36. In the same paragraph, mention is made of the value of the MIH to connections with other lake lobes. I suggest this could be a much stronger basis for support of an MIH than the one now proposed. Many of the other listed benefits are not documented as important at this lake.
37. P. 38. A 100 year event would not allow upland vegetation to remain for 99 years, as it takes decades before the vegetation first encroaches. Note that the Lake Geneva review contains additional comments on saw palmetto and trophy bass issues that also apply to Brooklyn.

38. P. 39. The MIL is argued as having a benefit of exposing the lake bed so it becomes available to upland species. Isn't this a direct contradiction of the MIH logic?
39. P. 40. As I understand it, the 81.3 ft value is far below the lowest the lake has ever been. In effect, as there are deep pockets even with almost no lake, fish are inevitably protected. [This despite no information on fish.] I need to understand why aesthetics is a better WRV for the MIH. On what basis can the District say "ok to make it worse than it already is"?
40. P. 44. Don't understand how low water events are necessary for safe operation of motorboats. Doesn't look to me like at the MIL boating (with a motor) is even possible. For this table see also comments on similar table in Lake Geneva report.
41. P. 48. I would have welcomed at least a summary of Price's results.
42. P. 48. In the conclusions, it may be useful to indicate the extent to which the previously-established MFLs will be reached under the new MFLs. This not intended as a regulatory evaluation, but a practical one - the prior levels all had a duration and frequency component. Will those levels and durations now be met more or less frequently? In short, how much change in hydrology is reflected in the new MFLs versus the old?
43. P. 50. Literature citations. Not entirely in alphabetical order.
44. P. 56. Be sure to check appendices for correct headers and figure numbers. It's clear some old appendices got dropped, but labeling did not get updated.
45. I enjoyed Appendix A but am not sure why it is part of this report, rather than reference or a linked document.
46. Note that I have not been asked to review the hydrologic model for this system. I do note that the amount of change in seepage between the 2008 and MFLs conditions is small, and you can expect challenges as to whether it is within the error margins of the models.