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September 4, 2007

National Advisory Team for Wetland Delineation
Regulatory Branch (Attn: CECW-CO)
U.S. Army Corps of Engineers
441 G Street, N.W.
Washington, DC 20314-1000

Dear Team:

Attached are my comments on the *DRAFT Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (hereafter Draft). Please include this letter and attachment in the official record for this supplement. The bottom line is that District and Division Engineers will be ill-advised to implement the “supplement” if it remains substantially as drafted. In my opinion, it would not withstand a Data Quality Act Challenge and will be subject to legal challenge on many fronts.

The fundamental problem with this draft “supplement” as with all of them that have been released so far is that it is not a supplement. Rather, it is a regional “replacement” for the fundamental precepts of the 1987 Manual. Table 1 of the Draft makes it clear that it is a replacement – not a supplement. It attempts to do under the guise of “supplement” what Congress objected to (Legislative Record S9341 – S9343) in 1991 when the 1989 Manual was put forward as a replacement to the 1987 Manual. It attempts to do what the 1991 “Revisions” to the 1989 Manual (56 FR 65964-65971) failed to do. As the *Bard* might say “A skunk cabbage (*Symplocarpus foetidus* OBL) by any other name still stinks.”

The Draft is fundamentally flawed in the following areas that I discuss in more detail in my comments:

1. It establishes a hydrology “standard” without Administrative Procedures Act (APA) process and without any technical support – simply taking it from an unpublished technical note, which relies upon untested recommendations of the National Research Council.
2. In direct opposition to the 1987 Manual, the Draft establishes a hydrology “standard” which would cause ground water that never reaches the surface to be regulated under the CWA, which is a surface water Act unlike the Safe Drinking Water Act that regulates ground water.

3. It makes the hydrology “standard” subservient to a host of field indicators the validity of which, are unsupported by actual data.
4. It establishes a hydrology “standard” with no documented, technical evidence validating the existence of natural wetlands throughout the region (or for that matter anywhere), which have exactly the hydrology required by the standard (water 12 inches below the surface for 14 days out of 730 days).
5. It subverts the fundamental independent confirmation of three “parameters” by adding a host of plant and soil features as hydrology indicators.
6. It summarily changes the status of all plants that had the 1987 Manual functional equivalent of FACU (i.e., FAC- plants) to FAC with no technical justification for each plant (or for any plant).
7. It changes the vegetation “strata” definitions without any technical justification and in the face of long-standing practice.
8. Contrary to sound technical practice, the Draft adopts “Test” soil indicators as equivalent to NTCHS-approved in the *Difficult Wetland Situation* chapter when verification of the existence of wetland conditions is weakest.
9. Instead of requiring strong indicators of the remaining parameters when one is weak, the Draft allows weak indication of one parameter to be supported by weak indication of one or more of the other two parameters to identify mesic habitats as wetlands (i.e., navigable waters in terms of the CWA) which then can be used to support significant nexus to traditionally navigable waters.
10. The Draft never provides the regulator or the regulated public with a final “nonwetland” conclusion. The best that is given “likely” or “probably” not a wetland. This is no way to regulate the public or to protect regulators from legal challenge.
11. This “supplement” along with all of the others is more similar than dissimilar from region to region with the most substantive differences being the adoption of regional soil indicators. Rather than making an already tedious process overly complex, the Corps should publish in the *Federal Register* a single replacement manual that is supported by technically defensible information and adopts the most recent, approved regional indicators of soils.

The 1987 Manual can certainly be updated and improved, both overall and with regional differences recognized. However, as the various drafts have indicated, the regional differences for identifying wetlands are relatively few and do not warrant some states requiring three or four different “supplements.” This draft regional supplement as with the others that have been released, is more about change than clarification. It establishes standards and conditions that have neither been subjected to the APA process nor have been demonstrated to have a technically sound base. It weakens the delineation process by making it more subjective at the time when the GAO and the Supreme Court says that it must be more definitive.

It is long-past time for a “National Standard” identifying what constitutes Section 404 wetland hydrology. Actually, the consideration of “significant nexus” identifies that it is long-past time for a standard of what constitutes federally regulated surface hydrology. The minimum standard should apply across the board – not one standard for streams,

rivers and lakes and another for wetlands. If the CWA regulates surface water, then the standard must specify water “to the surface” as the 1987 Manual and the 1991 and 1992 guidance documents do: not 12 inches below the surface as the new wetland hydrology “standard” does. If “gullies, small washes characterized by low volume, infrequent, or short duration”¹ generally are not jurisdictional waters, then neither should be vegetated landscapes that have a water table no closer than 12 inches below the surface for only 14 out of 730 days. Development of the standard should be done in the open through the APA. It should be based upon actual data interpreted in light of rulings in the courts, policy and the Constitution. All three branches of the federal government have failed miserably in providing the public with conclusive definitions and standards. This Draft and the others continue in this line of failed efforts and provide little to clarify a program that is very broken.

Sincerely yours,



Robert J. Pierce, Ph.D., PWS, CWD

cc:

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CESWT-DE

¹ June 5, 2007, Memorandum entitled *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States and Carabell v. United States*.

**Comments on the DRAFT Interim Regional Supplement to the Corps of Engineers
Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region**

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1. General: The supplements that have been drafted so far are more similar than dissimilar. The largest difference between regions is in the soils, which essentially uses (and defensibly only would use) the regional indicators for soils that NRCS has developed. Rather than having states with three or four different supplements that may apply, the COE should go through an Administrative Procedures Act (APA) revision of the 1987 Manual and simply produce one document that incorporates by reference the latest regional soils indicators and contains the other minor differences (that are legitimate) within a unified document. Both COE staff and consultants often work in several regions routinely. Having to refer to different supplements is an unnecessary complexity. The new manual should contain the procedure for doing a complete delineation including non-wetland waters of the U.S. No one can simply submit a delineation of wetlands for jurisdictional purposes. All of the ecological information on regions and wetlands within regions is the same now as it was when the 1987 Manual was published. The natural environment has not changed. All such introductory material can be placed in a separate reference volume that would be companion to a delineation volume. The comments that follow are from the subject Draft, however, many are the same as I submitted for the Arid West Draft and would be the same for the other regional drafts that have been promulgated.

2. The formulation of the Draft in general and the "Difficult Wetlands" Section in particular is ill conceived. The foundation of the 1987 Manual is the requirement for three independently derived confirmations that a landscape feature is sufficiently wet before it is determined to be a wetland and thus, regulated by the federal government. Independence has been lost in the Draft. More importantly, the Draft never actually indicates that the user can ever confidently determine that a landscape feature is NOT a wetland. At most after working through 140 pages of supplement, the user reaches such inconclusive statements as "the area is probably non-wetland" (p. 113) or "is likely non-wetland" (p. 102). This is a disservice to both the landowner and the regulator. Neither can have any certainty. This cavalier attitude towards the potential regulation of private land is especially egregious post Rapanos. Rather than requiring a certainty of the presence of each parameter before concluding that a feature is wetland, the Draft allows the user to build speculation upon speculation. For example (p. 102, para. 1.), the user is told that the feature is "...likely non-wetland unless soil and/or hydrology are also disturbed or problematic." While a human-disturbed system may have several parameters that need to be assessed and "reconstructed" after the fact, the "problematic" wetlands are naturally occurring systems. In such an instance, the Draft is condoning the use of

speculative field indicators of vegetation because the field indicators of soil and/or hydrology are also speculative. This acceptance of speculation is advocated for each of the three parameters in turn in Chapter 5. The Draft deviates from both the 1987 Manual fundamental premise as well as the NRC (1995) recommendations. Both require stronger evidence of the remaining two metrics when one is weak. The Draft ignores weaknesses and plows full steam ahead to capture landscapes as wetlands. Thus, the regulator must now determine whether the nexus to TNW is significant based upon a speculatively determined wetland in question as well as all the speculatively determined wetlands along a reach of stream. The emphasis of the Draft is when in doubt call it a wetland, when it should be if there is not sufficient evidence that the feature is a WATER of the U.S. conclude it is not. The Rapanos decision makes it clear that speculation is not a valid method of regulation.

3. p.1. The Draft cannot help but change boundaries if implemented as written. While no one really cares about the “+” or “-” for the FACW or FACU species, deleting the minus on FAC vegetation indicators will immediately affect large areas. As a member of the National Plant List Panel and the NE Panel back in the 80s, I know that plants that were rated FAC- where not considered hydrophytic by some members of the panels and were given the “-” designation so that they would not be considered such in the application of the 1987 Manual. The “FAC-” designation was not reached lightly. There were many discussions, species-by-species, region-by-region, about the appropriateness of including those species as hydrophytes. Deciding that a plant such as *Lonicera japonica* has equal probability of occurring in a wetland and non-wetland over its entire range of occurrence in a region is absurd. More importantly, no technical, data-supported justification is given in the draft for making FAC- plants count as wetland vegetation for purposes of Section 404 delineation. Not even the March 3, 1997 proposed modification to the list changed its status. As drafted, the change is arbitrary and capricious and, I believe, would not withstand a DQA or legal challenge. My suggestion is that if you intend to summarily dismiss the pluses and minuses, that all FAC- plants automatically become FACU plants for purposes of Section 404 delineation since FAC- plants were treated as such since 1987. For example, *L. japonica* in the north central region (the only one actually based on real data thanks to Dr. Gerry Wilhelm, Morton Arboretum) remains FACU on the 1997 draft revision to the list.

2. p.1 There has always been a disconnect between the definition of “wetlands” and the use of the plant list. FAC plants cannot be said to be adapted for life in saturated soils – they are adapted to live in mesic conditions whether saturated or not. This is the fundamental reason why use of the more than 50% rule has made vegetation an insensitive indicator. Dropping the minus from FAC species will make it even more worthless as a determinant. The biggest problem with application of the >50% rule now is that the vegetation on both sides of the delineation line usually qualify as wetland vegetation – it is an insensitive metric. This is especially true in the Atlantic Coastal Plain. FAC-neutral is a much more technically defensible metric. On April 12, 2007, I sent an email to Katherine Trott at COE headquarters identifying inconsistencies in the FONSI for the Arid West Supplement. That email stated in part:

On page 12 there is a summary response to my comments. ... I would like you to consider the following:

It states that abandoning [the dominance test for] the FAC-N test is unworkable because many wetlands would fail it. I challenge you to look at real data (such as I provided to you). The failed wetlands will invariably not have wetland hydrology. If you have real data on hydrology that counters this on a regular basis, I would sure like to see it. I have data from hundreds of ground-water monitoring wells from many places around the country that shows just the opposite. Steve Martin at NAO presented a paper at a SWS meeting in Norfolk some years back as did Peter Veneman that shows the opposite. Furthermore, the statement that the FAC-N test was dropped as a vegetation test in the March 6 1992 Qs & As is patently false. Read para 2.e. of that document. The only thing that the Qs and As did was add it as a hydrology secondary indicator, they did not remove it as a vegetation test.

FAC-neutral is much more consistent with hydrology data collected in the field. There is technical support for its adoption and should be the vegetation indicator of choice replacing the > 50% rule which is essentially meaningless and will be more so if all FAC- plants become FAC.

3. Adopting the Prevalence Index with a 3.0 break perpetuates this insensitivity and is inconsistent with Wentworth, et al. (1988) and Wakely and Lichvar (1997) – especially since the supplement drops the minus on FAC species. No data results are referenced in the supplement supporting that 3.0 is the appropriate threshold for hydrophytic versus mesic vegetation. To the contrary the only referenced documents addressing indicate that there are problems with the weighted average approach when the Index value is between 2.5 and 3.5 and that strong indications of hydric soils and wetland hydrology are necessary. It is especially inappropriate to rely on a 3.0 prevalence index break when either soils or hydrology are questionable (Wentworth, et al. 1988, Wakely and Lichvar 1997). I do not believe that adopting this process with a 3.0 break will withstand a Data Quality Act (DQA) or legal challenge, especially not as used when either soils or hydrology are “problematic.”

4. p. 2. The existence of a National Advisory Team to review rigorously developed data means that this supplement should be based upon rigorously developed data. None are referenced in support of the changes made. Where are these data? I do not believe that this supplement would withstand a DQA challenge. For example, the hydrology “standard” is a corruption of both policy and science. From a policy standpoint, it never went through APA process and, thus, has no policy legitimacy. It was “promulgated” through a Technical Note.¹ Standards need to be promulgated through the

¹ U. S. Army Corps of Engineers. 2005. Technical Standard for Water-Table Monitoring of Potential Wetland Sites. Technical Note ERDC TN-WRAP-05-02, U. S. Army Engineer Research and Development Center, Vicksburg, MS.

APA process. The EPA put the following technical procedures thru APA rulemaking the:

1. Sec. 403 Ocean Discharge Guidelines through APA rulemaking (45 FR 65952-65954, October 3, 1980);
2. 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (45 FR 85336 – 85357, Dec 24, 1980);
3. 404(b)(1) Testing Requirements for the Specification of Disposal Sites for Dredged or Fill Material (45 FR 85360 – 85367, Dec 24, 1980);
4. Criteria for the Evaluation of Permit Applications for Ocean Dumping of Materials (40 CFR Chp. 1 Part 227);
5. *1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands; Proposed Revisions* (56 FR 40446-40479, August 14, 1991) discussed above; and
6. Look at the 402 Program and RCRA, CERCLA to see what technical standards go thru rulemaking. For example:

[Federal Register: February 3, 2004 (Volume 69, Number 22)]
[Rules and Regulations]
[Page 5038-5087]
ENVIRONMENTAL PROTECTION AGENCY
40 CFR Part 63
[OAR-2003-0138, FRL-7551-6]
RIN 2060-AE79
National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)
AGENCY: Environmental Protection Agency (EPA).
ACTION: Final rule.

The Department of Agriculture has subjected the following technical procedures to APA rulemaking and its wetland procedures are all codified:

- 1.7 CFR Part 12 Highly erodible land and Wetland Conservation; Final Rule and Notice of Finding of No Significant Impact (52 FR 35194 – 35208, 17 September 1987)
2. Title 7: Agriculture
Part 12—Highly Erodible Land And Wetland Conservation Subpart C—Wetland Conservation

The Department of Energy uses the APA for promulgation of standards. For example:

Federal Register: August 27, 2003 (Volume 68, Number 166)]
[Rules and Regulations]
[Page 51429-51436]
DEPARTMENT OF ENERGY
10 CFR Parts 1021 and 1022
RIN 1901-AA94
Compliance With Floodplain and Wetland Environmental Review
Requirements
AGENCY: Department of Energy.
ACTION: Final rule.

These citations could go on forever. I think it is safe to say that 404 wetland procedures and “standards” appear to be the only program in the federal government that regulates private property and private activities that hasn’t gone thru APA rulemaking.

The hydrology “standard” is very different from the hydrology requirement of the 1987 Manual. Furthermore, it is an absurdity to say that a “standard” is secondary to field indicators. Standards need to be primary and directly related to the primary regulation that they are intended to support – in this case the Clean **WATER** Act (CWA). The purpose of the hydrology standard should be to determine what landscapes can be reasonably called navigable waters. Water no closer to the surface than 12 inches below it does not constitute navigable waters within the context of the CWA. It is strictly ground water and as such should be regulated by the Safe Drinking Water Act. That is the reason that the 1987 Manual indicates at para. 46 that water must be “to the surface.” That is why the phrase “to the surface” occurs five times in the one paragraph answering question 8 in the October 7, 1991 Qs and As and twice in para.3.a. in the March 6, 1992 Guidance. Field indicators should be secondary to the standard, based upon satisfying the standard and be subservient to the standard (i.e., measurement of the actual level of water). Finally, the “standard” is not technically defensible. I know of no natural, unaltered landscape in the Coastal Plain or elsewhere in the United States that the presence of a water table for **only** 2 weeks at 12 inches every other year would produce hydric soils or a hydrophytic plant community. If this is the national “standard,” then the COE should produce conclusive data that demonstrates that areas that just satisfy the standard would be recognized as such by wetland scientists. The Draft references no such data supporting the “standard” nor does the Technical Note – other than a citation to the National Research Council’s (NRC) 1995 study of wetlands. In that respect, the “standard” does not even follow the NRC recommendation. Furthermore, in the last 12 years since the NRC made its recommendation, data should have been evaluated to see if it was valid. Where are the data? It appears that the COE simply waited a decade and then established a “standard” without technical support or rulemaking.

Furthermore, it is an absurdity to say that a "standard" is secondary to field indicators. Standards need to be primary and directly related to the primary regulation that they are intended to support - in this case the Clean WATER Act (CWA). The purpose of the hydrology standard should be to determine what landscapes can be reasonably called navigable waters. Water no closer to the surface than 12 inches below it does not constitute navigable waters within the context of the CWA. It is strictly ground water and

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5. If you are going to use all of the MLRAs they should be depicted on Figure 1.

6. p. 5 to 10. All of this information as well as similar information for other regions belong in a companion volume to the delineation manual. Then there could be a single, updated manual that recognizes regional soil differences and any other minor differences from region-to-region in one text that would simplify the process.

7. p.9, last para. The formulation of this paragraph suggests, that many landscape features that will NOT qualify as wetlands are wetlands. It suggests that floodplains and riparian ecosystems, natural levees and bottomland hardwood forests are wetlands. While it is unlikely that the levees are ever wetlands, but only some of the others will qualify as wetlands. One of the major problems with the HGM literature is that the authors often include these broad categories of landscape features as wetlands even though many of them will not have the duration or frequency of hydrology necessary to constitute 404 wetlands. This para. either is an intentional effort to expand what constitutes 404 wetlands or it is an inadvertent slip into the functional assessment concept of wetlands.

8. p.11, para.1, last sentence. This sentence is contrary to the 404 definition of wetlands and mischaracterizes what is being identified by the Draft as wetland hydrology. The definition calls for species "typically adapted for life in saturated soils" - not "tolerate" inundation or saturation. To characterize a water table at 12 inches for 14 days every other year as "prolonged" saturation is ludicrous - especially when the water table meets these conditions only at the end of winter/beginning of spring when plant metabolism is low. Many species will not be growing early in the spring and are not stressed. Many species will have more than 50% of their roots (if not essentially all of their roots) above the water table at 12 inches and are not stressed.

9. p. 11, 3rd para, penultimate sentence. As in comment 7, floodplains are identified as wetlands.

10. p. 11, last para, last full sentence. Such shifts can occur in non-wetlands as well. This sentence simply adds another level of confusion to the process. Where are the citations for this phenomenon and specifically what types of wetlands are referred to? A condition with FACU and UPL species is likely to be found on drained hydric soils. The fact is that these plant communities may not be wetlands.

11. p.12 1st full para., penultimate sentence. This concept is taken straight from the 1989 Manual. While such situations do exist, they are very limited on the landscape and need to be specifically identified here – not simply leaving an open-ended concept.

12. p. 13, 2nd para, 2nd sentence. Use of the term significant is inappropriate and misleading unless you are referring to statistics or the concept of “significant nexus.”

13. p.13, 2nd para, penultimate sentence. Referring to use of a BAF prism is nonsense and should be deleted. It was salvaged from the 1989 Manual. As the Draft points out it can't be used for PI. Furthermore, I have never seen a delineation submitted for a JD that has used it. Have you? Is the statement that basal area can not be used in a PI, technically supported anywhere.

14. p. 13, last para. The PI as developed by NRCS used frequency data. Where are the technical data confirming that a PI using absolute cover is valid?

15. p. 14 list of strata. This is brand new. It is not consistent with the 1987 Manual, the 1989 Manual or with common practice. The Draft provides no technical support that the old processes caused any problem, or any data that these new strata are technically better. Why raise the subjectivity of deciding whether *Cornus florida*, for example, is a small tree or a shrub. This is needless change for change's sake.

16. p. 15, last para. See Comment 3 on the inappropriateness of making FAC-species FAC. If you are dropping the “+” and “-”, then ALL FAC- species should become FACU, because they have always been treated as functional equivalents (that is not hydrophytic vegetation) for purposes of the 1987 Manual. Penultimate sentence: the wording of this makes the process wide open to subjective abuse.

17. p. 16, 1st para, 2nd sentence. Not only “most wetlands” but also most non-wetlands in the coastal plain will pass the dominance test. That is why the dominance test is worthless and should be replaced by the FAC-neutral test. 3rd sentence. The converse is equally true. It is very common in the coastal plain for the dominants to be FAC. Examination of the non-dominants often reveals that the plant community is not hydrophytic. This entire paragraph shows a bias towards calling areas wetlands that are not.

18. p. 16, 1.b. “and/or” another example of never reaching a conclusion. The landscape can fail the plant dominance test and hydrology and still be considered a wetland because it is “problematic.”

19. p.20. Using a break point of PI 3.0 or less is not supported by any technical data provided and is not consistent with Wentworth, et al. It is especially inappropriate for problematic situations where it is most likely to be used. I do not believe that using a breakpoint of 3.0 will withstand a DQA or legal challenge.

20. p. 26. 2nd para under “Observe...” As written, people may be digging a lot of deep holes when unnecessary. “Often need to be greater than 20 in...” My experience with coastal plain soils is that it is rare that you need to dig deeper than 20” – not often. What is the source of the data supporting “often?” This deep-hole discussion should be limited to areas where both wetland vegetation and hydrology have been confirmed. The example of A12 is not intuitively obvious. Nothing in A12 indicates digging to below a meter, which I assume the Draft indicates because Mollisols may have a meter-thick A-horizon.

21. p. 26. 3rd para under “Observe...” If the Draft is going to suggest photographs of soils, then it should suggest that a neutral-gray card be inserted into the photo so that color can be adjusted correctly. It is possible to make an image of soil either hydric or nonhydric depending upon filters used during printing.

22. p.27, 1st full para. Give the source of the data supporting the statement about the wettest interior lacking indicators and the frequency of occurrence on the landscape.

23. p. 27-64. It does not appear that the latest version of *Field Indicators of Hydric Soils in the United States* was used in the Draft. They should be. In fact, all of the regional supplements should use the latest NRCS *Field Indicators* and not adopt ones unless they are officially approved. To do otherwise, especially based upon the lack of supporting data is arbitrary and capricious and not consistent with good technical practice. In this regard it is inappropriate to adopt Indicator TF2 since it has not been sufficiently tested to convince the NTCHS that it is correct.

24. p. 66, 1st para. NRC (1995) actually stated “provide strong evidence” not “the strongest evidence.”

25. p.67, 1st para. The “technical standard” is fundamentally flawed as discussed above.

26. p. 67, 3rd full para. Use of 32° F in the south is appropriate.

27. p. 67, last para. The long-term average should never be used when actual hydrology data are collected. You need to determine independently the beginning of the growing season because of the potential large annual variability. WETS table data are not sufficient.

28. p.68, 1. The two-plant requirement should be based upon dominants and preferably native species.

29. p.68, 1. f. If the emergence or opening of flowers occurs before green leaves are present it is not the start of the growing season. Growth in plants is the increase in mass or storage of high caloric molecules (lipids). It can only occur through photosynthesis. Plants that flower before leaf out are alive but are not growing. They are actually using energy stored during the last growing season – just as they survive the winter on the same energy. During the fall such plants produce a primordial flower bud, which over-winters and opens based upon a combination of genetics and climate. Red maples in Maryland may blossom during the end of January, long before the start of the growing season. Peaches in Georgia, etc. may blossom and be destroyed by frost. Although fruit may not set that year, it is only if a hard frost hits after the plant leaves have swelled and burst that the plant itself is in jeopardy. Indictors “a”-“e” are good; “f” should be dropped as technically inappropriate. The end of the growing season should be based upon the period when the majority of leaves have changed color – not when leaves fall. There is no more growth once chlorophyll has been degraded – only energy storage from leaves to roots.

30. p. 68, 2. There is no technical support provided for changing the depth of temperature analyses from 50 cm as determined by NRCS and the 1987 Manual to 30 cm. The change is arbitrary and capricious and I do not think that it would survive a DQA or legal challenge.

31. p.68, last para. many of the C and D Group indictors are directly contrary to both the 1987 Manual and the October 7, 1991 and March 6, 1992 guidance documents.

32. p. 72. A2. There should be a strong caution of “water seeping into the pit” after rainfall events not necessarily representing wetland hydrology. There are many systems where the “water table” will remain in the top 12 inches or puddle on the surface during the non-growing season and be totally lost almost immediately upon leaf-out. These are not wetlands but this language makes it easy to call them such.

33. p.74, B1. Why does the highest watermark necessarily represent the most recent event? Do you have data supporting this? Present it.

34. p. 76, B3. Debris “widely distributed within the dewatered area” is not a good indicator. There is often debris widely distributed in stream corridors that is unrelated to water deposition in areas that may not be wetted from the floodwaters. Basically, this indicator as written states that any debris, can constitute a hydrology indicator.

35. p. 79, B5. I believe that the film or sheen on the water surface is a biofilm produced by iron-oxidizing bacteria and not actually oxidized iron. The orange flocculent under the sheen on the sediment is oxidized iron mixed with bacteria and organic compounds.

36. p. 80, B7. This should not be a primary indicator – especially if it is based only upon one aerial photograph. This should not be a secondary indicator either – only supporting

information. Surface water during the non-growing season can be easily misinterpreted and is a seductive indicator for those anxious to find wetlands.

37. p.81, B9. Water-stained leaves should not be a primary indicator. They can form very quickly entirely during the non-growing season and may indicate non-growing season puddling – not wetland hydrology. Where are the data supporting this as primary indicator?

38. p.84, B6. This should not be a secondary or primary indicator – only supporting information. The fine-grained sediment might be deposited from very short-duration events, over a long period of time or on extraordinary event in the distant past. There is no way to know if the deposit is recent.

39. p. 85, B8. By definition, a wetland is vegetated. The Draft specifies 5% cover of vegetation necessary. How can an area that is unvegetated be a wetland? This should not be a secondary or primary indicator – only supporting information. Furthermore, where are the technical data supporting that the lack of vegetation indicates long duration inundation? My experience is that many areas lacking vegetation are usually ones with very flashy surface hydrology. Thus, neither wetland or non-wetland vegetation can become established because of frequent, short-duration puddling. Such landscape features by definition in the 1987 Manual are non-wetlands.

40. p.86, B10. This indicator shouldn't be limited to flow patterns – that is flowing water. A depression by its very nature is a drainage pattern.

41. p.87, B16. Get rid of this. This should not be a secondary or primary indicator – only supporting information. The draft doesn't specify which mosses count and which don't, when the result is from an infrequent event as opposed to a frequent one of long duration. The results were from Florida and there are no data presented as to the reliability anywhere else. It doesn't account for ice-rings causing such lines during the non-growing season in the north.

42. p.88. This should not be a primary hydrology indicator. Based upon the chemistry of H_2S , it cannot exist in the presence of oxygen. Therefore, anytime the H_2S is present, the soils actually have to be saturated. A lot of people mistake other odors for hydrogen sulfide. It may be difficult to determine whether the odor is from above the 12-inch break or below it. Finally, 12-inches is not a valid break point.

43. p.89. C3. This should not be a primary indicator or a secondary indicator – only supporting information. There is too much we don't know about it. Where are the technical data supporting it as a primary indicator along the entire Atlantic and Gulf coast? There have been documented instances of these forming in non-wet, pastures and feedlots rich in N compounds. They can form very rapidly in saline soils, which are likely to exist in the coastal plain and not be indicative of long duration hydrology. They are often misidentified as discussed in the Draft as well as by roots growing through redox concentrations that are not pore-linings.

44. p. 90, C4. Alpha, alpha'-dipyridyl can give false positive readings in direct sunlight.
45. p. 91, C6. This should not be a primary or secondary – only supporting information. Where are the technical data supporting this as a hydrology indicator? How do you tell if the soil has been tilled in the last two years? How do you know if your are looking at freshly-formed, redox concentrations or relict features that have not been destroyed? There are too many uncertainties regarding soil-forming features to use this as a primary indicator. The presence of redox features alone is not even adequate to demonstrate aquic conditions for soils (Vepraskas 1995) let alone use it as a hydrology indicator.
46. p. 92, C7. This should not be a secondary or primary indicator – only supporting information. Where are the technical data supporting this indicator along the entire Atlantic and Gulf Coasts? How do you know whether the organic layer had been thick but has been oxidizing and is now 1-inch thick after being dewatered?
47. p.93, C2. This should not be a secondary or primary indicator – only supporting information. The user needs to be cautioned about natural subirrigation.
48. p. 94, C8. This is acceptable as a secondary indicator, however, the caution on vegetation should be strong, i.e., the vegetation should be dominated by FACW and OBL plants primarily. Much of the coastal plain will have FAC vegetation especially if FAC-plants become FAC. Crayfish can burrow to 3 meters or deeper (Pennack 1978. Freshwater Invertebrates of the U.S.)
49. p.95, C9. This should not be a secondary or primary indicator – only supporting information. You cannot see soil saturation on an aerial photograph – only darker soils that may or may not be saturated. Moist soils have a lower value than dry soils. It is too easily confused, and most practitioners will not bother to field verify. Simply verifying the presence of hydric soils with a photograph that has darker signatures where the hydric soils exist, says nothing about whether actual saturation is present or not. The wording of the last sentence of this indicator is very telling. It equates the presence of hydric soils with seasonal high water table even though there is no necessity that the presence of such soil indicators is determinant of contemporaneous wetland hydrology.
50. p. 96, D2. This should not be a secondary or primary indicator – only supporting information.
51. p. 97, D3. This should not be a secondary or primary indicator – only supporting information.
52. p. 98, D5. This should not be a secondary or primary indicator – only supporting information.
53. After producing a litany of hydrology indicators, many of which are totally unsupported by technical data, there is still no acknowledgement of negative indicators –

indicators, which demonstrate a lack of wetland hydrology. For example, deciduous trees typically have shallow roots when a high water table exists during the growing season. Deciduous trees with deep penetrating roots (deeper than 12 inches) are a bioassay indicative that the plants are not stressed by high ground water during the growing season. Obviously, the deeper the penetration of the roots, the deeper the stress from ground water or the absence water stress. This is a powerful indicator in drained hydric soils. If the presence of crayfish chimneys is a hydrology indicator, the presence of burrows of non-water species such as gophers, ground squirrels, groundhogs, skunks, foxes, coyotes, etc are indicative that a shallow water table is not present. Even if the soils are hydric and the vegetation is all FAC. We have data to support these negative indicators.

54. Chapter 5. As discussed at the beginning of these comments, the entire premise for this section is fatally flawed. It needs to be totally rewritten with the exclusion of all the speculative and unsubstantial language that is present in it. The fundamental premise should be when the indicators for one “parameter” are weak, the indicators for the other two need to be stronger. When in doubt, the benefit should be given to the property owner, not the federal government. If it is not clearly a “water,” it should not be labeled as one by application of tenuous, speculative, insubstantial, or technically unsupported indicators. Break out the data for all of this. The public is entitled under the DQA to know what this is based on.

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Born: April 28, 1948
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Education and Recognition:

Legislative Operations Round Table For Executives, Washington, D.C., 1985
A/E Contracting for Military Construction, New York, 1982
Regulatory Functions Basic Course, Alexandria, VA, 1977

Ph.D., Miami University, 1977
Dissertation Title: Life History and Ecological Energetics of the Gizzard
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Thesis Title: Energy Cost of Food Utilization in the Bluegill
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Outstanding Performance Rating, NADCO-OP, N.Y., 1977 - 1978
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Special Act Award, CECW-OR, Washington, D.C., 1987
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Certifications:

Maryland Forest Conservation Act, 1992
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Professional Experience:

President, Wetland Science Applications, Inc., 1989 - Present
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Lecturer, School of Arts and Sciences Part-time Graduate Program,
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Biologist, Office of the Chief of Engineers, Regulatory Branch,
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Publications:

(With Ronald L. Wiley and Thomas E. Wissing). 1973. Interconversion of units in studies of the respiration of aquatic organisms. *The Progressive Fish-Culturist*. 35: 207-208.

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Wetland Training Institute, Inc. 1995. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual. R. J. Pierce, ed. WTI 95-3. 143 pp.

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Resources, Great Lakes, Land Use and Environment Committees. May 9, 2006.

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New Mexico	New York	N. Carolina	Ohio	Oklahoma	Pennsylvania
S. Carolina	Tennessee	Texas	Utah	Vermont	Virginia
Washington	W. Virginia	Wisconsin	Wyoming		