

**Comments on “Guidelines for Recollecting Samples from Marsh Stations”  
presented at the May 20, 2008 TOC meeting**

DOI Everglades Program Team  
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It is important that the TOC develop, as far as reasonable, clear guidance on sampling, and analysis procedures to be followed when unusual circumstances arise. Developing these prior to the occurrence of unusual situations will streamline decision making as well as help to avoid any appearance of bias among TOC members. Development of these guidelines is therefore a worthwhile effort. We commend the SFWMD and the author, Pete Rawlik, for their efforts. We submit the following comments on the draft guidelines for consideration by the author and the TOC. Here, **Highlight** designates added text suggestions, and ~~strikethrough~~ designates suggested deletions.

General questions and comments

We suggest the general questions:

- How many times has this re-collection occurred in the past?
- If this protocol was put in place, how many times would this have been triggered?

These questions would be appropriate to discuss in a future TOC meeting after the current revision is completed.

Introduction section: We do not believe that there is ever any statistical disadvantage to having added information. Although added information may complicate some statistical evaluations, this complication should not stand in the way of additional data collection when needed. We suggest deleting the sentence

~~Consequently, the existence of more frequent data, whether collected routinely or in response to unplanned events, creates difficulties in both the application and interpretation of compliance tests.~~

Multiple Causes section #2 Sample collection failure: More guidance or a clearer definition would be helpful. Define or replace the terms “timely manner” and “ambient conditions.” Ambient conditions are always changing, and more clarity in the guidelines would be helpful here.

Multiple Causes section #3: When you read the document in its entirety, does this section mean that the entire network would be re-collected if one bottle is past its holding time? If so, this guidance should lay out a mechanism by which SFWMD official is available and immediately notified to make decision on those sample collection/processing dates.

Multiple Causes section #4: Why is the time lag described as weeks or months? We have been told that EVPA samples are processed for TP within 5 days of collection.

Multiple Causes section #4: Last sentence seems indecisive. Research into causes for elevated TP in the Refuge is, we believe, mandated under the Consent Decree. Gaining a better understanding of causes of anomalous measurements is in the interest of all parties and is a part of good QA/QC. Whether categorized as research, monitoring, or QA/QC, any needed field work to better understand causes of outliers is well-justified. We do understand that there may be practical and logistical constraints to such examination.

Multiple Causes section #4: Is the title “project manager” well defined at the SFWMD? If possible, please more clearly define “project manager” and “another, acting in an official capacity.”

Factors Influencing - overview paragraph: There appears to be a discrepancy whereas here TP is the only value of priority concern/consideration (and Tdepth), but the State used TSS to (we feel inappropriately) flag May/June 2005 data. If a TP value is unusual (as defined in this guidance), how will other parameters (e.g., TSS, TN, SO<sub>4</sub>, CL) be used in supporting the management decision to re-collect?

Recollection Guidelines Project Logistics #1: Does this mean that the SFWMD is interested in optimizing (reducing) compliance network stations?

Recollection Guidelines Project Logistics #: The statement “Any data resulting from using other methodologies must not be considered as appropriate for inclusion in the compliance calculation.” goes beyond the scope of this guidance. It should be deleted.

Recollection Guidelines Sample Collection Failures #2: the "at least three" monthly samples appears to be specific to the Lox EVPA network at high water, but not the 4-part test network or other WQ compliance networks in the EPA based on sample size? We suggest deleting the 3-sample threshold

As a guideline, a sampling event which suffers a failure of ~~at least three samples, which amount to at least 25%~~ **or more** of the required monthly samples ~~required for the monthly compliance test for a specific waterbody,~~ should be considered compromised and ...

Recollection Guidelines Sample Collection Failures #2: It would also be helpful to provide a better rationale for the 25% threshold. Is there a statistical justification for the 25% value?

Item #3 on page 5 under Recollection Guidelines for Result Validation states  
“As a guideline unusual is defined as greater than the historical maximum value plus twice the standard deviation, or less than the historical minimum value minus twice the standard deviation.”

This is problematic for three reasons. First, in almost all cases, the minimum minus 2 standard deviations will be negative, thus no unusually low values will be defined. Second, the use of maximum and minimum values for sampling sites with large numbers of records reduces the large amount of information about the distribution of values

observed at the site to a single observation. As the number of records increase, the likelihood that this value is itself an outlier increases. Third, data for TP are typically skewed, and are often approximately log-normal in distribution.

It is suggested that an unusual value have a recurrence of very roughly 1:50 samplings. Consistent with this suggestion, and based on sampling at the Refuge EVPA marsh sites (LOX3-LOX16), it is suggested that this definition be revised to:

Unusual is defined as deviating more than three standard deviations from the mean of the log-transformed site data series.

An alternative definition that is conceptually simpler and gives similar values is<sup>1</sup>:

Unusual is defined as greater than four times the median or less than one quarter of the median of the site data series.

Recollection Guidelines Sample Collection Failures #3: The requirement that the request must be “justified in writing and approved by the supervisor of the Field Project Manager making the request” seems overly officious and unnecessary. We feel it should be deleted. We do urge that the reason for re-collection be placed in the comment field of DBHYDRO.

Recollection Guidelines Sample Collection Failures #5: recollection within 2-days. Is there a mechanism in place to make this happen? We know of none.

Recollection Guidelines for Result Validation #5: We disagree with the requirement that re-collection sampling be within the calendar month, and feel this requirement should be eliminated from the guidance. Additionally, up to 2 weeks here appears to conflict with 2-days guidance earlier.

Recollection Guidelines for Result Validation #1: May any Park or Refuge staff request re-collection if they recognize an aberrant condition?

Recollection Guidelines for Result Validation #8: Requiring another formal approval seems excessively bureaucratic. If this requirement is maintained, we do suggest rewording to make it clear that the decision is not intended to inappropriately change a compliance outcome, but to reduce uncertainty and improve credibility:

... costs and the potential impacts on **credibility of** compliance **determinations**.

### Minor and editorial comments

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<sup>1</sup> This simpler definition is based on the fact that, for a log-normally distributed random variable, the median and geometric mean are equal, and on the observation that the standard deviation of the log (TP) at all of these sites is near 1.56 (dimensionless), which is near the cube root of 4, 1.59. Thus, the median multiplied or divided by 4 is very roughly equivalent to the log transformed TP range of +/- 3 standard deviations.

This is SFWMD guidance within the oversight of the TOC. We feel it can therefore provide more clear direction. We suggest the following change in the first paragraph.

This document briefly outlines the theoretical causes ~~which may result in the collection of a second sample from a station~~ **missing or lost samples**, and ~~suggests~~ **establishes** guidelines for when and if such a **replacement sample collection (re-collection)** should or should not be **attempted** considered.

Recollect (rek'ə lekt') means to call back into your mind, or remembering. It is suggested that here recollect and its variants should be everywhere hyphenated (e.g. re-collect, re-collection).

The filename *Resampling Guidelines.TOC.5.20.08.doc* should be revised to **Re-collection Guidelines.TOC.5.20.08.doc** for consistency with the title. This change may make searching for the file easier in future years.

On page 1, 7<sup>th</sup> line from bottom, add a reference to spills  
... and/or preserve a collected sample, **spills and** bottle breakage, ...

On page 1, last line  
... collected in a timely manner **(see guidelines below)** and before any ...

Multiple Causes section #1, third line: should be "collection within a **given** month"

Multiple Causes section #2, 8th line (sentence starting Regardless): should be "subsequently, the **SFWMD** project manager"

In bullet number 1 under Factors Influencing Guidelines, we suggest deleting the parenthetical information. This change is suggested because this practice may change in the future, and because currently there are, at times, more parameters than TP measured at sites when  $10 \text{ cm} < \text{TDEPTH} < 20 \text{ cm}$ . It is suggested also that the word "clear" be added to avoid confusion among readers who are unfamiliar with the SFWMD definitions. We suggest the following revision.

Total **clear** water depth influences the applicability of compliance tests and dictates which parameters are collected at any station (~~i.e. <10 cm no sample, >10 cm but <20 cm TP only, and >20 cm all parameters~~); therefore; ...

Similarly we suggest for Guidelines for collection Failures #1.

A second sample may only be collected if the lost sample is a TP sample or if the measurement of total **clear** water depth was done improperly.

Recollection Guidelines Sample Collection Failures #5: When our name is stated in full, we prefer the title "A.R.M. Loxahatchee National Wildlife Refuge"