

IMPAIRED WATER IDENTIFICATION RULE STAKEHOLDER MEETING SUMMARY August 9, 2004

ADEQ PRESENTATION AND PROPOSAL SUMMARY

It is ADEQ's responsibility to:

- Determine whether any portion of a reach or lake is impaired, and
- Determine whether it is impaired at any time (provided the impairment is persistent and/or recurring).

ADEQ takes precautions to avoid erroneous or unnecessary 303(d) listings through the following procedures:

- Sample plans and QA/QC plans are reviewed
- The binomial approach (current and proposed) corrects for potential sampling error
- Opportunity is provided for the regulated community to provide monitoring data from surface waters receiving discharges to verify impacts are not occurring
- Surface waters are not listed if adequate documentation is provided that shows:
 - Anthropogenic activities are not a source,
 - Actions have been taken in the watershed so that uses will be attaining by the next assessment,
 - Newer, more reliable data exist that show impairment is not occurring,
- 303(d)/305(b) is reviewed extensively by ADEQ internally
- Draft 303(d) list is released for public review
- If there is sufficient evidence that a listing was made in error, or that water quality has improved after listing, ADEQ will delist the surface water

ADEQ researched the binomial approach:

- Binomial method in current IWIR was modeled after the binomial developed by Florida's Dept. of Environmental Protection (DEP)
- ADEQ researched Florida State University Dept. of Statistics technical report used in developing Florida's Impaired Waters Rule
- The report's conclusion was, for a 95% confidence that a >10% exceedance rate has occurred (null hypothesis = attaining):
 - The minimum number of samples is 10
 - The minimum number of exceedances is three
- Florida DEP went with 20 samples instead of 10 because data being used had varying or unknown quality

ADEQ proposes the following modifications to make the binomial more statistically sound:

For Listing:

- Minimum number of exceedances for listing is three (collected over three or more sampling events)
- Minimum sample size is 10 unless sufficient exceedances for listing have already occurred (three)
 - Based on: three exceedances in 3-9 samples, achieves between 99 – 100% probability that exceedance rate is >10%
- Using a weight-of-evidence approach, a listing will *not* be made until 10 samples are collected, if there is substantial evidence that the listing would be in error
- Raise confidence level from 90% to 95% to determine impairment
- Raise confidence level from 80% to 85% (minimum) to determine attainment

For Delisting:

- Minimum requirements for delisting are 0 exceedances in a minimum of 27 samples
 - Based on: using the reverse null hypothesis (null hypothesis = impaired) to achieve a 95% confidence level that the true exceedance rate is $\leq 10\%$
- Using original null “attaining” hypothesis used to list, at 0 of 10 exceedances, the confidence level drops to 65% for delisting -- this is not statistically valid
- Using a weight-of-evidence approach, a delisting can be made based on fewer samples if there are documented improvements in the watershed

SUMMARY OF STAKEHOLDER COMMENTS AND CONCERNS

Comments regarding accurate determination of impairment:

- Need sufficient sampling to represent entire reach or lake through time before listing.
- Consider different effects of flow conditions.
- Concern over dissolved oxygen listings based on sample sites that are not representative (i.e. pooled water).
- Consider a more holistic approach, impacts on aquatic life, rather than relying on water quality standard violations.
- Need a variety of samples for a variety of pollutants to characterize true impact on a designated use.
- Since more money is available for monitoring after 303(d) listings are made, could provide ADEQ incentive to make more listings.
- Weight of evidence approach could be used to increase number of listings for above reason.
- Consider using weight of evidence for chronic Aquatic and Wildlife assessments (*next meeting*).
- If ADEQ errs, it should err toward making a listing when in doubt, in the interest of protecting resources.
- ADEQ should instead err on the side of caution because unnecessary listings may delay TMDLs in truly impaired areas.

ADEQ Response:

Credible data requirements ensure that only high quality, representative data are used in the assessment process. It is not necessary that samples represent an entire stream reach or lake, under all conditions, before a 303(d) listing can be made. It is ADEQ's responsibility to determine whether any portion of a surface water is impaired, and whether it is impaired at any time, provided the problem is persistent or recurring. Extent of impairment and critical conditions are important pieces of information that will be determined during the TMDL investigation, not during the assessment process.

ADEQ is open to considering new, more holistic approaches to assessment, and continues its research into use of biological criteria and narrative standards for assessment purposes. However, numeric standards are, and will continue to be, important indicators of water quality as well and must be used in the assessment process. While ADEQ does require that a full suite of parameters be tested before a full assessment of all designated uses can be made, impairment can be caused by one pollutant and impact only one designated use.

ADEQ has taken appropriate precautions to guard against unnecessary 303(d) listings (see Aug. 9th presentation for more details) and shares stakeholder concerns about expending TMDL resources in areas where an investigation is not warranted. The Department maintains that the proposed modified binomial approach, along with credible data requirements already in place, should reduce listing errors (Type I and II) and ensure that ADEQ focuses its resources on those areas where further investigation is most needed.

Comments regarding the impact of 303(d) listings on permits:

- Results in facilities being required to test for more pollutants.
- Must navigate stricter regulatory requirements when renewing permits or expanding facilities.
- Increased monitoring requirements become burdensome if TMDL investigation is delayed.
- Construction general permitting process more complex.
- Urban areas more tightly regulated overall.
- Anti-degradation review will become more stringent.
- Storm water (MS4) permits will be impacted even though impairment may originate from many sources.

ADEQ Response:

ADEQ recognizes that there are some costs to permitted facilities associated with 303(d) listings. ADEQ believes its proposed modified binomial approach minimizes error in listing while ensuring protection of public health and the environment (see Aug. 9th presentation for more details).

Comments regarding proposed modifications to the binomial approach:

- ADEQ should consider returning to the >10% “raw score” approach.
- ADEQ may be modifying binomial approach only because of EPA overfilings.
- Other statistical approaches, such as lognormal distribution, should be considered.
- 27 samples for delistings seem excessive given that ADEQ is short on monitoring resources.
- ADEQ should not have modeled the rule after Florida’s rule in 2002. Problems were pointed out but not addressed during development. More care should be taken during this process to avoid mistakes.

ADEQ Response:

ADEQ is proposing revisions to the binomial approach for several reasons. EPA overfiling is certainly a concern, since EPA maintains authority for final approval of states’ 303(d) lists and has partially disapproved Arizona’s 2002 list (and likely the 2004 list). ADEQ must consider applicable federal guidance when developing listing methods. What also factored very importantly in ADEQ’s proposal to revise the IWIR were statistical problems with the current binomial approach and consideration of available monitoring resources. ADEQ maintains that the 20-sample minimum in the current IWIR is neither statistically defensible nor realistic in terms of available data. Certainly if 20 samples are available, they will be used for a listing decision, but statistically valid listing decisions can be made based on smaller datasets (see Aug. 9th presentation for details). ADEQ has considered both EPA’s perspective and listing guidance, as well as stakeholders’ perspectives, in proposing a new approach.

ADEQ understands the concern regarding the proposed 27-sample minimum for delisting a surface water; however, once a surface water has been identified as impaired, more samples are necessary to achieve the same confidence level as was used for listing (95% is proposed, see presentation). It should also be noted that more monitoring resources are available after a 303(d) listing has been made, making the 27 samples feasible to achieve.

ADEQ did present the 10% “raw score” approach as an option in its first stakeholder meeting in June. Comments from stakeholders following the meeting indicated no support for methods other than the binomial. The Department has decided to pursue modifications to the binomial approach, since this statistical approach helps to address stakeholder concerns regarding potential sampling and/or analysis errors. ADEQ developed its proposal based on the best available information from EPA guidance and from other states’ experience.