Nutrient Criteria Implementation: Frequent Questions

For the most recent version of these Frequest Questions, please visit EPA's nutrients website at http://www.epa.gov/waterscience/criteria/nutrient/

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Standards

1. How do nutrient criteria relate to antidegradation procedures?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. States have existing antidegradation policies and procedures, which must be followed for nutrient criteria. States may modify their procedures at their discretion to address new/increased loadings of nutrients. For more information on antidegradation, please refer to 40 CFR 131.12 and Ephraim S. King memo, Tier 2 Antidegradation Reviews and Significance Thresholds (USEPA, 2005).

2. How will trans-boundary impacts be best addressed (e.g., nutrient loading to a river in state A causes no local problems but contributes to algal blooms in a downstream estuary in state B)?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. EPA's regulations provide that "[i]n designating uses of a water body and the appropriate criteria for those uses, the state shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." 40 CFR 131.10. See also 40 CFR 122.4(d) and 122.44(d)(4) for information on permitting requirements related to the water quality of downstream states.

3. Can the designated use be removed if the naturally occurring conditions exceed the criterion?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. States may take one of two approaches to address natural conditions that exceed the criteria in a water body: 1) changing or removing the designated use, or 2) adjusting the criteria. When naturally occurring pollutant concentrations prevent the attainment of designated use, states may remove a designated use which is not an existing use, as defined in 40 CFR 131.3(e) provided the state demonstrate the designated use is not attainable. States can also change the designated use by establishing subcategories of a use. A use attainability analysis must be performed to change or remove a designated use that is a 101(a) use (40 CFR 131.10 (g)). Also, refer to the WQS Handbook (USEPA, 1994) for more information on use attainability analyses. Alternatively to changing designated uses, States may establish site-specific numeric aquatic life water quality criteria by setting the criteria value equal to natural background. For more information on site specific criteria and natural background, please refer to 40 CFR 131.11(b) and Tudor T. Davies memo, Establishing Site Specific Aquatic Life Criteria Equal to Natural Background (USEPA, 1997).

4. When making water quality standard attainment decisions, are there exceptions for natural causes of violating a water quality standard?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Assessments of water quality are dependent on how the criteria are written into the water quality standards regulations. If a state does not have a provision for setting criteria based on natural background or natural conditions in its water quality standards regulations, or does not have site specific criteria based on natural background, then the criteria in place for the designated use for that water body would be the basis for determining whether the water body is impaired. If the state has a provision allowing for adjustment of the criteria based on natural conditions, the water body may be found to attain water quality standards. For more information on site-specific criteria and natural background, please see 40 CFR 131.11(b) and Tudor T. Davies memo, Establishing Site Specific Aquatic Life Criteria Equal to Natural Background (USEPA, 1997).

5. Does the adoption of nutrient standards that have different numeric criteria for different water body types constitute a subcategorization of uses, as described in 40 CFR 131.10(c)?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. States are required to adopt water quality criteria that protect the designated use (see 40 CFR 131.11 (a)). If a state believes that the designated use can be attained with different water quality criteria, it may adopt site-specific (or eco-specific) criteria without changing the designated use. If, however, the state believes that the highest attainable aquatic life uses may be different from the currently designated uses for different types of water bodies (such as streams, lakes and reservoirs, rivers, or coastal waters), the state may subcategorize its aquatic life uses to reflect the highest attainable use. A use attainability analysis (UAA) must be conducted when a state or tribe changes or removes a designated use, or adopts subcategories for uses that protect CWA 101(a)(2) uses if the new use or subcategory will require less stringent criteria than those associated with the previously designated use. Please refer to 40 CFR 131.10(c), (j), and (k) for the regulatory requirements for establishing subcategories of designated uses and 40 CFR 131.11 for the regulatory requirements for establishing criteria.

6. Are the procedures and necessary supporting documentation for site-specific nutrient criteria development based upon “natural causes” different from the procedures and supporting documentation needed to support a use attainability analysis (UAA) and subsequent nutrient criteria to support the lower use?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. The processes for establishing site-specific criteria and conducting a use attainability analysis have similar steps for data collection and analysis. For more information on site-specific criteria see Chapter 3 of the WQS Handbook (USEPA, 1994). Regulations governing use attainability analyses can be found at 40 CFR 131.10(g). For questions about establishing water quality criteria for aquatic life equal to natural background levels, please see EPA's memorandum, "Establishing Site Specific Aquatic Life Criteria Equal to

Natural Background" (USEPA, 1997). More information may also be found in The Lake and Reservoir Restoration Guidance Manual (USEPA, 1990b).

Permits

1. What design flow is appropriate for calculating limits for nutrients?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Design flows for effluent limit calculations are based on treatment design flows at individual facilities. Please refer to 40 CFR 122.45(b) and Chapter 6 of the NPDES Permit Writers' Manual (http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45) for more information on determining appropriate effluent design flow.

2. What monitoring requirements for nutrients are necessary in permits?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. In general, monitoring requirements in permits must effectively ascertain compliance with effluent limits. Please refer to 40 CFR 122.44(i) and Chapter 8 of the NPDES Permit Writers Manual (http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45) for more information.

3. Should WQBELs apply only if a water is determined to be impaired by nutrients?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. The permitting authority must include a WQBEL in a permit if nutrients or any pollutant cause, contribute to, or have the reasonable potential to cause or contribute to an excursion of a water quality standard. In other words, even if a water body is not currently impaired for nutrients, a permit writer must include a WQBEL if a discharge has the reasonable potential to cause or contribute to an excursion of the nutrient criteria. For more information on WQBELs, please refer to 40 CFR 122.44(d).

4. When determining reasonable potential for nutrient NPDES permits, are dynamic models appropriate, and if so, which models?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. The decision to use dynamic models (time variable models) depends on the water body system to be modeled. The factors one considers to determine when to use a time variable model are found in a suite of technical guidances related to modeling the fate and transport of contaminants for the purposes of developing wasteload allocations that OW published between 1983 and 1990 (USEPA, 1983a; USEPA 1983b; USEPA, 1990a).

5. How can new nutrient criteria be implemented in existing NPDES permits?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. The permitting authority may be able to modify an existing permit (a

new nutrient standard may be an allowable cause for modification) during the existing permit term, wait until the end of the permit term, or use an overlay permit that captures multiple facilities and provides additional flexibility. Permitting authorities are encouraged to consider a watershed-based permitting approach, which allows for the coordinated reissuance of permits with applicable limits throughout a watershed and may expedite implementation of new criteria while lowering administrative burden. The Virginia Chesapeake Bay and the Connecticut Long Island Sound Permits are examples where states have utilized the overlay permit to implement new nutrient criteria. Refer to 40 CFR 122.62 and Chapter 11 of the NPDES Permit Writers' Manual (http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45) for regulatory requirements and information on reopening a permit. For more information on examples of overlay permits, refer to "Case Study 1 - General Permit for Nitrogen Discharges" and "Case Study 13 - Chesapeake Bay Watershed, Virginia: Watershed-based General Permit for Nutrient Discharges and Nutrient Trading" located on EPA's watershed-based permitting website at http://www.epa.gov/npdes/watersheds.

6. What options are available when treatment technology does not exist to enable dischargers to meet the WQBEL?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. If dischargers cannot meet the WQBEL based on existing water quality standards, states have the option of changing the water quality standards through variances or changes to designated uses, which would result in a different WQBEL that could be met. In other instances, dischargers may be able to meet the WQBELs based on existing water quality standards through options such as offsets from point and nonpoint sources (e.g., land based BMPs) and water quality trading, and watershed analysis. For information on variances, refer to EPA's Water Quality Standards Handbook (USEPA, 1994). For information on changing designated uses, please refer to 40 CFR 131.10 (g). For information on offsets, trading, and watershed analysis, refer to the watershed-based permitting website at http://www.epa.gov/npdes/watersheds and the water quality trading website at http://www.epa.gov/owow/watershed/trading.

7. How can watershed-based permitting strategies, trading, or other novel permitting strategies be utilized to "meet" water quality standards?

The answer to this question is not specific to nutrients. EPA promotes using a NPDES watershed approach and water quality trading as innovative tools that may provide low cost implementation solutions for meeting water quality standards. For more information on these tools, please refer to the watershed-based permitting website at http://www.epa.gov/npdes/watersheds and the water quality trading website at http://www.epa.gov/owow/watershed/trading.

8. How do technology-based effluent limits affect the need for water-quality based effluent limits (WQBELs) in permits?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Water quality-based effluent limitations are needed where

technology-based effluent limitations are not stringent enough to meet applicable water quality standards. Refer to 40 CFR 122.44(d) and Chapter 6 of the NPDES Permit Writers' Manual (http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45) for more information on WQBELs.

9. Can a permit require chemical and biological sampling at points other than the discharge outfall?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Biological sampling may be appropriate to effectively monitor the discharge status and ensure compliance. One practice for collecting ambient monitoring is described in EPA's Interim Guidance for Performance-based Reductions of NPDES Permit Monitoring Frequencies (www.epa.gov/npdes/pubs/perf-red.pdf), which states that the permit authority can grant reductions in effluent monitoring for a permittee with a history of good compliance and permitting performance in exchange for ambient monitoring. In an attempt to test some of the ideas in the 1996 Interim Guidance, performance track facilities have been piloting programs to strike a balance between ambient monitoring and end-of-pipe monitoring. Specifically, Kodak Colorado Division and other dischargers near Kodak on the Cache la Poudre River have formed an ambient water quality monitoring group. This group was formed in cooperation with the Colorado Department of Public Health & Environment (CDPHE) to monitor the ambient water quality of the receiving water body. Refer to: https://yosemite.epa.gov/opei/ptrack.nsf/vRenewalViewPrintView/70067EB5DC425383852572F8007E8405 for more information about this ambient monitoring group. Refer to Chapter 8 of the NPDES Permit Writers' Manual (http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45) for information on including special studies and additional monitoring in NPDES permits.

10. Are seasonal water quality-based permit limits for nutrients appropriate?

The answer to this question is specific to nutrients. Seasonal water quality-based permit limits are not explicitly specified in the NPDES regulations under 40 CFR 122. However, seasonal permit limits may be acceptable if they are consistent with applicable water quality standards, and with the assumptions and requirements of the wasteload allocation of any approved TMDL (40 CFR 130.7(c)). For example, if the water quality standards for nutrients provide for seasonal limits, permits can include seasonal limits. See the memorandum Annual Permit Limits for Nitrogen and Phosphorus for Permits Designed to Protect Chesapeake Bay and its tidal tributaries from Excess Nutrient Loading under the National Pollutant Discharge Elimination System at http://www.epa.gov/reg3wapd/npdes/pdf/ches_bay_nutrients_hanlon.pdf .

Monitoring, Impairment, Assessment, and TMDLs; Permits

1. Can a new source or a new discharger be authorized in water bodies that are currently listed as impaired for nutrients?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. New sources and new dischargers can be authorized in water bodies currently listed as impaired. If a TMDL has been developed, the permit writer must demonstrate that there are remaining pollutant load allocations to allow for the additional loads and compliance schedules designed to bring the impaired water body into compliance with applicable water quality standards. When a TMDL has yet to be developed, the new source or new discharger can obtain a permit when certain conditions are met such as when the dischargers do not contain the pollutant causing the impairment, or other pollutant source reductions will offset the new discharge. For more information, refer to 40 CFR 122.4(i) and page 38 of EPA's decision on the Chesapeake Bay Foundation petition at http://www.epa.gov/water/cbfpetition/petition.pdf.

Monitoring, Impairment, Assessment, and TMDLs

1. How should sources of pollutant loadings be determined?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. To identify sources of pollutant loadings in a water body segment, states should identify point and nonpoint sources of the pollutant of concern. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of natural background. For more information, please refer to EPA's TMDL guidance (USEPA, 1991a) or the Source Assessment section of the Protocol for Developing Nutrient TMDLs (USEPA, 1999). More information may also be found in The Lake and Reservoir Restoration Guidance Manual (USEPA, 1990b).

2. When is source identification conducted as part of assessment and listing decisions?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Impairment decisions are based on the state's assessment of the water quality attainment status of the water body. Source identification can be performed during this assessment and included as additional optional information along with the impairment decision. Source identification does not affect the impairment decision except where natural conditions are demonstrated to be the sources of the impairment. Under some conditions, the state may adjust its criteria to reflect natural conditions, thus removing the impairment. For more information, please refer to EPA's Integrated Report Guidance (USEPA, 2006b).

3. Is there a minimum data requirement needed to assess whether a water body is not attaining applicable water quality standards? For example, would one exceedence of one variable of the criteria lead to the determination that the water body is not attaining applicable water quality standards?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. How the nutrient criteria were developed and written into the water quality standards should inform decisions about how the criteria are used in assessment decisions. While it is possible that a state may have minimum data requirements, EPA regulations require states to assemble and evaluate all existing and readily available water quality-related data for assessment decisions. Thus, depending on the expressed water quality standard, one exceedance of one variable may or may not lead to a determination that the water body is attaining its use. For more information, see 40 CFR 130.7(b)(5) and EPA's Integrated Report Guidance (USEPA, 2006b).

4. How should loads be allocated for multiple sources and source types to the same reach or segment?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. Each state has the discretion to decide how to allocate loads in such a manner that water quality standards will be achieved. For more information, please refer to EPA's TMDL guidance (USEPA, 1991a) or the Allocations section of the Protocol for Developing Nutrient TMDLs (USEPA, 1999).

5. In the TMDL process, how do you allow for future growth and associated increases in nutrient loadings that will reach a lake? How is reserve capacity awarded and what happens when it is "used up"?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. TMDLs can account for future growth by choosing to allocate a certain percentage to new sources. However, a future growth allocation or reserve capacity allocation is not a required component of a TMDL and reduces allocations for existing sources. In some areas, such as urbanizing watersheds, allocating for future growth can accommodate new point sources, such as a wastewater treatment plants. Each state has the discretion to decide how to allocate loads in such a manner that water quality standards will be achieved. Under an adaptive management approach, a state can revisit existing TMDLs, revise them and resubmit them for EPA approval, as needed. For more information, please refer to EPA's TMDL guidance (USEPA, 1991a).

6. In the absence of a TMDL, do permitting authorities have the flexibility to use a watershed approach similar to a TMDL analysis? Does EPA have guidance on an appropriate margin of safety for nutrient TMDLs associated with the wasteload allocation/load allocation (WLA/LA) to ensure that water quality standards are met when implemented into permit limits?

This question is not entirely specific to nutrients, and therefore, is answered the same as for any other water quality criteria. (a) Yes, in the absence of a TMDL, permitting authorities have the flexibility to use a watershed approach similar to a TMDL analysis. One such approach is watershed-based permitting, which may be valuable where a TMDL is not available or as a tool to implement a TMDL. However, unless the watershed-based permitting effort includes all of the required elements of a TMDL or a TMDL alternative, a water body impaired by nutrients should remain on the 303(d) list until it meets standards or has an actual TMDL established or approved by EPA. The Chesapeake Bay implemented a watershed-based permitting approach for controlling nutrient discharges, which can be found at http://www.epa.gov/reg3wapd/npdes/pdf/ches_bay_nutrients.pdf. For more information on watershed-based permitting, see www.epa.gov/npdes/watersheds. (b) For information on determining the margin of safety for nutrient TMDLs, refer to Chapter 9 of EPA's Protocol for Developing Nutrient TMDLs (USEPA, 1999).

Criteria

1. Are the criteria expressed as an index (like a TSI) that depends upon a combination of factors?

The answer to this question is specific to nutrients. This question has a technical response on NSTEPS at: http://n-steps.tetratech-ffx.com/Q&A-Implementation.cfm. A good summary description of the trophic state index (TSI) can be found at: http://dipin.kent.edu/tsi.htm. In summary, the trophic state can be defined as the weight of living biological material (biomass) in a water body at a specific location and time. A good indicator of trophic state is the level of cloudiness in the water. The criteria language should be specific on which variables should be considered, if that is deemed critical to ensuring the criteria are protective.

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