Implementation of SQOs in NPDES Permits

SQO Advisory Committee Meeting

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NPDES Subcommittee

- Kevin Buchan, WSPA
- Tom Grovhoug, LWA
- Lisa Haney/Dave Montagne, LACSD
- Ed Kimura, Sierra Club
- Sarah Newkirk (or other), Ocean Conservancy
- Susan Paulson, Flow Science, Inc

Draft NPDES Guidance Document

- 1st Draft circulated 17 March
- Have not heard from all members as to their review
- Subcommittee will continue to work on document over the next few weeks to assure all members have a chance for input
- This presentation summarizes the main points of the document as currently drafted

Characteristics of SQOs

- SQO are different from aquatic life-based WQOs
  - Primarily influenced by mass loads rather than water column concentrations
  - Based on effects measurements
  - Not necessarily pollutant specific
  - Applied as a site assessment tool
- Cannot simply derive effluent limits directly from SQOs

The Challenge: To connect NPDES Point Sources & Sediment Quality

- EPA Guidance recognizes the difficulty in connecting point sources to sediment quality
  - USEPA Technical Support Document for Water Quality-based Toxics Control, March 1991 (EPA/505/2-90-001): SQOs could be used to establish permit limits to ensure that uncontaminated sediments remain uncontaminated or sediments already contaminated have an opportunity to cleanse themselves. ***This would occur only after criteria and the means to tie point sources to sediment deposition are developed.***

Information needed

- Identification of factors that are causing or contribution to impairment of SQ
  - Conceptual and Analytical Models
  - Source Assessment
  - Linkage analysis
- Comprehensive assessment of mass loadings
  - To identify and quantify contributions to SQ in a water body
- TMDL Process provides a framework with the potential to meet these needs

NPDES Permitting Approach

- Four Stages
  1. Assessment
  2. Confirmation
  3. TMDL
  4. NPDES permitting

- Other sediment management activities may be appropriate
  - In lieu of or in combination with NPDES permit limits
  - Depending on the sources of pollutants

Assessment (1)

- Application of MLOE as stipulated in narrative SQO
- Determines whether an SQO is exceeded at a *site*
- Site considered to exceed if either direct effects or indirect effects observed

Assessment (2)

- Direct Effects (Aquatic Life Use)
  - Relationship to site implicit in MLOE
  - Determined directly from chemical contamination, toxicity, and benthos collected from the sediments at the site
- Indirect Effects (Wildlife or Human Health Use)
  - Not implicitly related to a site
  - Relationship complicated by the many factors involved in contaminant flow through food web
  - Source of exposure may be local or remote to the site at which contaminated fish are found

“Confirmation” (1)

- Assess the ecological significance of findings at a *site* to protection of uses addressed by SQO
- Two types of confirmation
  - Causation
  - Spatial & Temporal Extent
- Both help determine the relevance of site-findings to sediment pollution and control/remediation

"Confirmation" (2)

- **Causation** must be established before effective actions/controls can be implemented
- Particularly important for site exceedance of Direct Effects SQO (effects on the benthos)
  - Direct Effect SQO MLOE does not turn on identity of specific chemical pollutants
  - Does not provide linkage between chemicals measured, toxicity, and benthic response
  - Factors other than chemical pollution can lead to degraded benthos
- – Indirect Effects SQO does not pose same problem
  - Pollutant of concern is that which is demonstrated to be bioaccumulating within food web to levels that pose unacceptable risk to wildlife or human health

“Confirmation” (3)

- **Spatial & Temporal Extent**
  - Assessment of multiple sites within a water body is necessary to delineate the spatial extent and, hence, the ecological significance of findings
  - Likelihood that a site (or water body) condition is ephemeral or seasonal should be assessed
    - Controls to address perennial impairment may differ from those applied to short duration or cyclical events
  - Will methods manuals include sampling design guidance addressing these questions?

TMDL (1)

- Having established water body impairment and identified the causative or contributing chemical contaminant(s):
  - Assess presence of pollutants of concern in NPDES effluents
  - If present, identify all sources of pollutant of concern to water body
  - Quantify relative mass loads from NPDES permittees as compared to other sources (*e.g.*, non-point sources, sediment sources of legacy pollutants, aerial deposition)

TMDL (2)

- Use this information as input to modeling and linkage analysis to determine portion of mass loads from each source that contributes to sediment impairment
- Derive TMDL with appropriate margins of safety
- Implement TMDL through development of WLA, LA, and/or sediment management actions (*e.g.*, dredging, in situ containment, *etc*)

NPDES Permitting (1)

- Where NPDES permitted discharges are contributing to impairment, the permits for discharges to that water body should be modified to reflect the WLA.
- An assessment should be made to evaluate degree to which all reasonable methods of prevention, treatment, and BMPS have been applied to reduce loads from each NPDES source

NPDES Permitting (2)

- Sediment Management Zones (SMZ) may be established for the water body
  - Response within the sediments to control measures may be slow
  - SMZ allow adequate time for implementation and realization of the benefits of corrective actions
- If controls implemented in response do not produce the desired result, the assumptions of the TMDL should be re-examined

NPDES Permitting (3)

- Where TMDL identifies additional data needs NPDES permittees should be encouraged to participate, as appropriate, in:
  - Additional monitoring
  - Special studies
  - Regional monitoring and research
- These efforts should be focused on resolution of issues directly related to the mitigation of the impairment

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