Kansas
Department of Health and Environment
Division of Environment

KDHE Division of Environment

Bureau of Water

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Kansas Department of Health and Environment

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Reevaluating and Revising TMDLs for Nutrients

Kansas Approach and Overview

Kansas Department of Health and Environment
Bureau of Water
Watershed Planning, Monitoring, and Assessment Section

Objectives

- Drivers for TMDLs Revisions
- TMDL Revisions – Pros vs Cons
- Challenges
- New TMDL Development Approaches
- Solutions in TMDLs to Mitigate Reassessment Actions
- Improvement in TMDL Development

Why TMDLs are flagged for Revisions

- Court Decree TMDLs (approvals circa 2000-2004)
- Nutrient related (vague)
  - Dissolved Oxygen
  - pH
  - Eutrophication
  - Biology
- Older TMDLs and development approaches
  - Land uses analysis
  - CNET
  - Abbreviated discussion and assessment
  - WLAs were often nondescript focusing on the sum
  - Emphasis was on Nonpoint Source Bacteria (Point sources disinfect)

Why TMDLs are flagged for Revisions

- TMDL implementation for nonpoint was theoretical and optimistic
- WQ datasets are now more robust and existing conditions were stated prematurely
- Some Data analyses changed
  - TKN beginning in 2000
  - BOD → TOC
  - FCB → e.Coli

Why TMDLs are flagged for Revisions

- Evolution of the 319 Program and Nine-Element Plans
  - Offered justification and reasoning to reevaluate TMDLs within targeted watersheds
  - Identified need to recheck and rework loading numbers
  - Numbers understated relative to current approaches/models
    - NPS load reduction targets being met with no WQ response
  - Number overstated
    - NPS reductions are unachievable
  - WQ conditions have deteriorated from stated conditions in TMDL
  - NPS implementation non existent or scattered
    - Has shifted to targeted with emphasis on effective practices

Why TMDLs are flagged for Revisions

- NPDES permitting
  - GPS database for facilities was incomplete
    - Facilities inadvertently left out of TMDLs
    - Focused on Municipal Facilities
  - WLAs may be nonexistent or vague – example text:
    - *Point Sources: Since this impairment is primarily associated with agricultural and urban nonpoint source pollution, there will be no Wasteload Allocation assigned to point sources for nutrients under this TMDL.*
    - *At this point, the Wasteload Allocation will be a reduction of nutrient loadings such that average phosphorus concentrations are below 100 ppb in stream and nitrogen concentrations average below 200 ppb at flows below 10 cfs*
  - No accounting for growth or new dischargers
  - MS4 WLA emerged in early 2000's

Why TMDLs are flagged for Revisions

- Priority Interest for Re-evaluation
  - Dredging Project
  - Large Federal Lakes
  - New Treatment Plants or dischargers
  - As Requested – stakeholders or 319 counterparts
  - New research from partner (i.e. USGS or University)
  - Flagged during NPDES review – WLAs implementation issues

- End of the court decree allowed for flexibility and time to reflect on the information (or lack thereof) within the approved TMDLs

Pros and Cons of TMDL Rewrites - Pros

- Lake TMDLs are a total makeover
  - Updated with BATHTUB
- Revised TMDLs tell the real story
  - Mixed sources are allocated appropriately
- Improve utility and useable information for
  - Permit writers
  - Nonpoint Source Projects
- Shores up defensibility

Pros and Cons of TMDL Rewrites - Pros

- Take advantage of opportunities with new TMDLs for new impairments
  - Bundle TMDLs with revision and new impairments
- In-depth analysis
  - Improvement of tools, available data, and approaches
  - Original TMDL may be 10 pages; revision ~100 pages

Waterbody: Prairie Dog Creek from headwaters to Norton (Keith Sebelius) Lake and Norton (Keith Sebelius) Lake
Water Quality Impairments: Total Phosphorus and Eutrophication

This TMDL serves as a revision for the Eutrophication portion of the existing Norton (Keith Sebelius) Lake Eutrophication/pH/Dissolved Oxygen TMDL approved by EPA on August 7, 2003.

Pros and Cons of TMDL Rewrites - Cons

- There needs to be a reason to revise
  - No beans awarded
  - Rigor of EPA review is nothing compared to years past with original approval
  - WQS changes not a primary reason if TMDL and actions appropriate
    - Fecal to E.coli - its all Bacteria
  - Resources – staff time
  - Is there room in the development schedule: “Vision”
  - Appropriate allocations may be addresses with another impairment
    - A new TMDL addressing another impairment may address and allocate nutrients in the watershed (Eutro/TP/ Bio)
  - Have things really changed

TMDL Rewrites - Challenges

- Data Gaps – ambient and discharger data
- Duplicate (sometimes conflicting) allocations
  - TP may be allocated in a Bio or Eutrophication TMDL
    - Establish new WLA based on current approach
- Revise or Rewrite
  - Revising existing documents can be tricky
    - Worked one through with the region due to NPDES flag, but was more recent
    - Staff changes; obsolete data files; new software (Qpro/Wordperfect to Excel/Word)
  - Generally these are rewrites
    - Public Notice required

Current TMDL Focus

- Kansas focusing on Total Phosphorus TMDLs – TMDL Vision Priority
  - Addresses narrative standard
  - Emphasis on reduction rather than establishing numeric criteria
  - Endpoints look at Biology, sestonic chlorophyll and DO
  - Allocations and milestones focus on TP
  - Point Source Reductions via update treatment technologies/operations
  - Nonpoint Source Reduction via targeted application of BMPs

TP WLA in NPDES Permits

- Total phosphorus goals are introduced in the first permit after TMDL approval
  - Concentration and annual pounds/year (rolling average)
- Permit may include a schedule of compliance
- TP mass goals should be met by end of first permit
- TP mass limits typically set in second permit after TMDL approval

Solutions in TMDLs to Mitigate Reassessment Actions

- Adaptive Management – current approach
  - Sequence of point source reduction, NPS BMPs & biological monitoring
  - …followed by another iteration of reduction as needed by biology (phased TMDLs)
- Reopeners
  - Establish text within the TMDL to reopen and adjust
  - Assign individual WLAs, but Focus the WLA budget on the sum in the watershed;
  - Rebalance WLA as needed –they are not property assets
    - Discharging is a privilege, not a right
  - Reserve WLA created for new WW & MS4

Solutions in TMDLs to Mitigate Reassessment Actions

Desired endpoints of this TMDL and implementation activities may be adjusted accordingly

Should future point sources be proposed in the watershed and discharge into the impaired segments, the current Wasteload allocation will be revised by adjusting current load allocations to account for the presence and impact of these new point source dischargers

Improvement in TMDL Development

- Build flexibility into allocations
  - MS4 and WLAs – reserve capacity to accommodate growth
  - Assign nominal WLAs into the budget
    - MS4 during lower flow condition
    - Facilities that are not contributing sources to the impairment (background/pass through/ deminimus)
  - If plant upgrades result in lower design flows:
    - decrease WLA accordingly
  - If plant upgrades anticipate increased flows:
    - Hold WLA and design for lower effluent concentrations (generally)
    - Evaluate antidegradation
  - Cautious if you are working off assumptions if DMR data are lacking

Solutions and Improvement in TMDL Development

- Takes time for implementation and WQ response
  - Phase I – 20 years
  - Phase 2 – another 10-20 years
- Thoughtful Margin of Safety
  - compensate for the lack of knowledge between allocated loadings and the resulting water quality
  - Conservative assumptions
    - to be assured that future WLA will not cause further excursion form criteria
    - WLAs at design flow; when majority of facilities under design flow
    - WLAs set for all discharging facilities, even if not likely to contribute to the impairment

Solutions and Improvement in TMDL Development

- Nothing is Perfect – Be Adaptive
  - Get the process going, things will line up eventually
    - Move the needle – get things implemented
  - Plan to mitigate Data gaps
    - Define monitoring strategies to address these (especially Biology)
    - New data may dictate the course for reassessment
- TMDLs don’t go away (ever)

Questions

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