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Kansas Surface Water Quality Standards Triennial Review Updates

**Bureau of Water
Kansas Dept. of Health & Environment**

Outline

- **Part 1** – What are the Kansas Surface Water Quality Standards (KSWQS)?
- **Part 2** – Triennial Review Process
- **Part 3** – Key Issues
- **Part 4** – Additional Issues

Water Quality Standards (WQS)

- **Designated Uses** – State recognized uses of a water
 - Aquatic Life
 - Irrigation
 - Recreation
 - Industrial
 - Drinking Water
 - Livestock Watering
 - Groundwater Recharge
- **Criteria** – Conditions necessary to protect uses
 - Narrative; free from toxicity, color, solids, etc.
 - Numeric; threshold values, e.g. nitrate = 10 mg/L
- **Antidegradation** – Policy designed to keep clean waters as clean as possible

Water Quality Standards (WQS)

- Each state has the primary role in establishing its own WQS
- Need EPA's approval before taking effect
- EPA has oversight authority/responsibility
- Should be reviewed and/or updated periodically
 - Triennial Reviews

Kansas Statute and Regulations

- ***K.S.A. 82a-2001(a)***
- ***KAR 28-16-28b to 28-16-28g, and Tables of Numeric Criteria***
- ***Kansas Antidegradation Policy***



Triennial Review

- Last full review completed in 2004
 - WQS modified in 2005, 2006, 2007, 2008, 2009
- The current review started in October 2009
- Focus Group with members representing:
 - **State agencies:** *Wildlife & Parks, Agriculture, Water Authority*
 - **Regulated communities:** *League of Kansas Municipalities, Chamber of Commerce & Industry, Farm Bureau, Livestock Association, Corn Growers Association*
 - **Environmental groups:** *Sierra Club, Kansas Natural Resources Council, League of Women Voters, Audubon of Kansas, Kansas Riverkeeper*
 - **Other technical groups:** *Society of Professional Engineers, Kansas Biological Survey*

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Triennial Review Process

- Six key topics identified by the Focus Group
 - January 2010
- KDHE developed white papers on the six topics
 - September 2010
- The Focus Group reviewed and approved
 - November 2010
 - Initial review
 - January 2011
 - Second review and additions
 - February 2011
 - Addition of impact assessment
- **Public Meetings seeking inputs from the public**

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What's Next?

- KDHE develops WQS changes based on public comments
- KDHE holds Public Hearings
- The State adopts the modified KSWQS
- KSWQS review by the Legislature
 - Joint Committee on Administrative Rules and Regulations
- EPA approval or disapproval of KSWQS
- Implementation of any final KSWQS

Key Issues

- Arranged in alphabetic order, not priority

Antidegradation

- The current policy in place since 2001
- Need to further define implementation procedures
 - Identification of Tier 2 waters
 - “High Quality” waters
 - Economic or social justification
 - Alternatives analysis
 - *De minimis* provision
- The goal is to clarify and simplify the procedures

Antidegradation

- 3 Tiers of waters
 - Tier 1 – just achieves water quality goals
 - Tier 2 – better quality than needed to achieve quality goals
 - Tier 3 – Outstanding National Resource Waters
 - Wildlife Preserves, wilderness areas, etc.
 - KS example is Cheyenne Bottoms wetlands
 - No new or expanded discharges that alter water quality
- Tier 2 is where the action is
 - A new or expanded discharge must undergo analysis
 - Is there an important social or economic reason for a discharge?
 - If so, what are the treatment alternatives and their costs?

Antidegradation: Tier 2 Options

➤ Option 1

– Pollutant-by-Pollutant

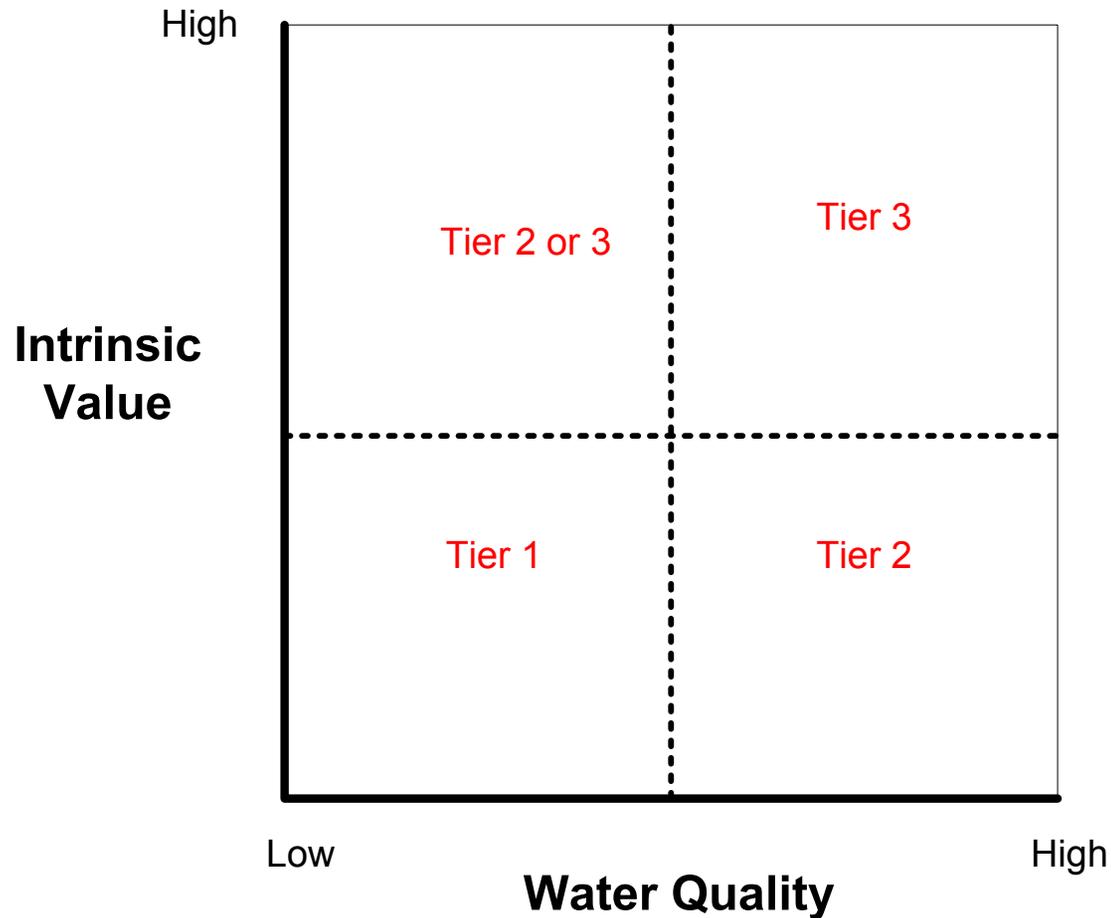
- Each pollutant evaluated individually

➤ Option 2

– Waterbody-by-Waterbody

- Each waterbody is defined
 - Based on quality only
 - Based on quality and intrinsic value (is it a water that we want to protect because it is important to many) – for instance the Kansas River due to its value for recreation and a drinking water source

Antidegradation: Tier 2 Options



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Antidegradation: Social or Economic Justification

➤ Option 1

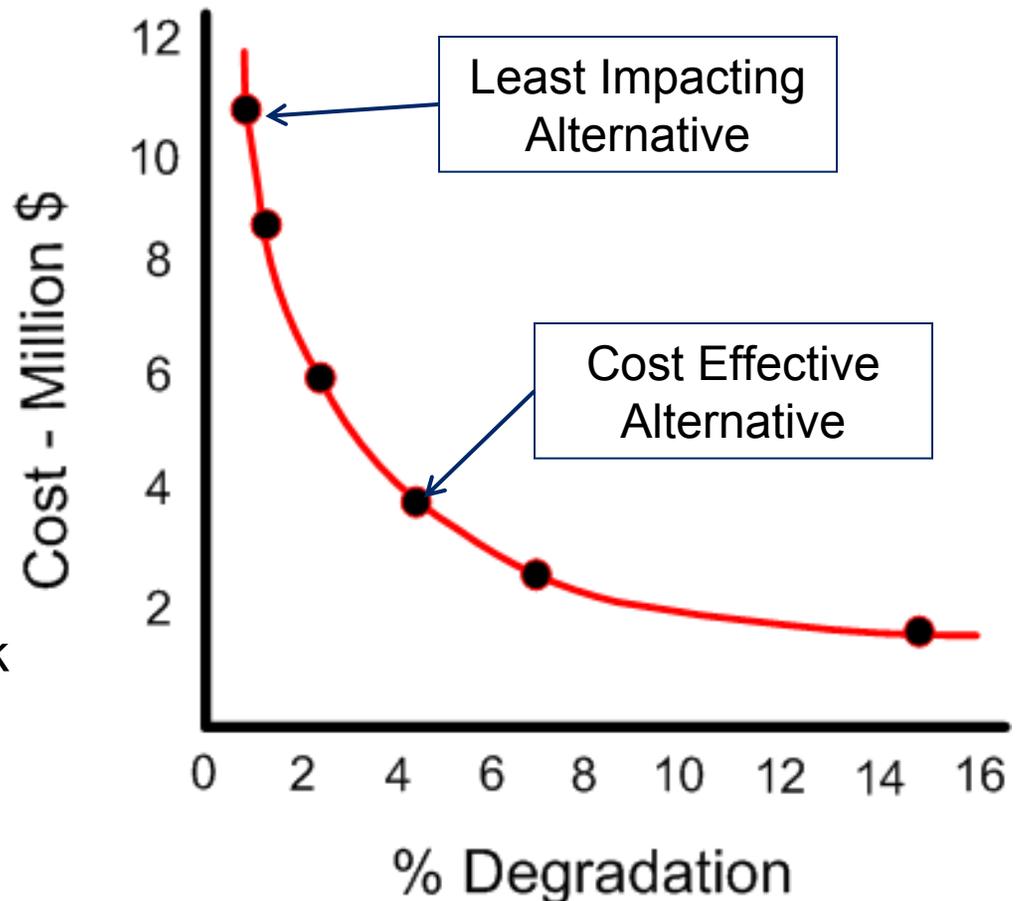
- Utilize EPA's Interim Economic Guidance
 - Outdated
 - EPA agrees it leaves something to be desired
 - Nothing new on the way

➤ Option 2

- Utilize EPA's Interim Economic Guidance and other means
 - What might those other means be?
 - Some examples we have seen
 - » New or expanding municipal facility = community growth
 - » New or expanding industrial facility = economic growth

Antidegradation: Alternatives Analysis

- Option 1
 - Mandatory acceptance of the least impacting alternative
- Option 2
 - Accept most cost effective alternative
 - Biggest bang for the buck

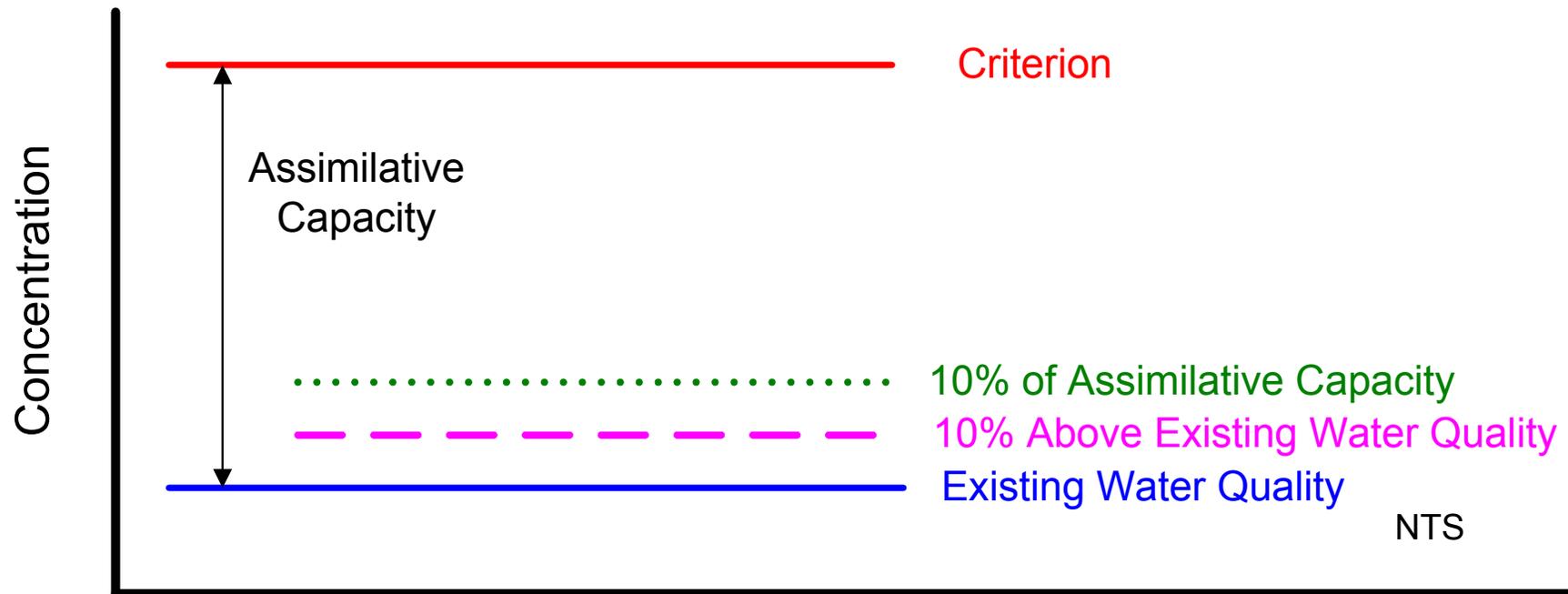


Antidegradation: *De Minimis*

- A minimum amount of degradation allowed
 - Does not require Tier 2 review
- Option 1
 - Do not allow for a *de minimis* provision
- Option 2
 - Allow a *de minimis* provision
 - *Based on a percentage of assimilative capacity*
 - *Based on a percentage increase above the existing water quality*

De Minimis Provision

Antidegradation Concepts - 10% of Assimilative Capacity vs 10% Above Baseline



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Bacteria Criteria for Streams

- Bacteria are indicators of waters' sanitary quality
- Since 2001, stream criteria are based on geometric means (GMs) of 5 samples in a 30-day period
 - *KSA-82a-2001*
- EPA later recommended seasonal geometric means during the recreation season
 - Kansas doesn't have seasonal criteria
- Seasonal GM is a better indicator of overall sanitary quality than the 30-day GM

Bacteria: Options

- Option 1
 - Maintain the status quo for sampling frequency and duration;
 - Adopt seasonal geometric mean criteria
 - Require Legislative action to amend State Statute
- Option 2
 - Adopt a single sample maxima criteria for streams
 - Require Legislative action to amend State Statute
- Option 3
 - Wait; EPA may publish new bacteria criteria by Oct 2012

Chlorophyll-a

- Eutrophication (excessive nutrient input) can add significant costs to drinking water treatment plants
- The goal is early detection and prevention
- Kansas has only narrative criteria for nutrients
- Chl-a is an indicator of nutrient enrichment
 - The most common photosynthetic pigment
 - **An excellent indicator of algal production**
 - Excessive nutrients are often the main cause of algal blooms, e.g., the lake closures last summer
- Taste and odor problems are more likely to occur when chl-a levels are above 10 µg/L

Chlorophyll-a: Options

- Maintain only the current narrative nutrient criteria
- Chl-a criteria for public water supply lakes or reservoirs - the lower of 10 $\mu\text{g/L}$ or the long-term average, with no margin of safety
- Chl-a criteria for public water supply lakes or reservoirs - the lower of 9 $\mu\text{g/L}$ or the long-term average, with a 10% margin of safety
- Adopt EPA Region VII RTAG's benchmark – 8 $\mu\text{g/L}$

Dissolved Oxygen (DO)

- DO is critical for the support of oxygen-demanding aquatic organisms
- Current criterion is a minimum of 5 mg/L
- Listed on the *impaired waters [303(d)] list* if failed more than once every three years
- Low DO may occur naturally, such as during periods of leaf fall, or natural springs
- DO levels in thermally stratified lakes are likely low beneath the top layers

Dissolved Oxygen (DO): Options

- Lower the DO criterion to 4 mg/L as an instantaneous minimum
- Assess DO as a chronic criterion (binomial 10%)
- Explicitly state allowances for DO lower than 5 mg/L when caused by documented natural conditions
- Explicitly exclude applying DO criterion to the bottom layer of a lake

Duration & Frequency (D & F)

- Numeric water quality criteria have 3 components
 - Magnitude (how large), e.g. 250 mg/L for chloride
 - Duration (how long), e.g. four-day average
 - Frequency (how often), e.g. once every three years
- D & F NOT addressed by KSWQS, but by 303(d) Listing Methodology (not part of KSWQS)
- Need to be addressed in KSWQS following a recent lawsuit in Florida
 - Avoid potential litigation in KS

Duration & Frequency: Options

- Continue the status quo, no direct tie-back to KSWQS
- Define D & F for each pollutant in KSWQS
- Explicitly state assessment procedures in KSWQS
- Explicitly delegate the definition of D & F to the 303(d) Listing Methodology
- Adopt the 303(d) Listing Methodology by reference
 - The Listing Methodology will become a part of the KSWQS and require EPA's formal approval for any revisions

Temperature

- Important for propagation and survival of fish
- The current criteria
 - Max $\leq 32^{\circ}\text{C}$
 - Changes by a artificial source $\leq 3^{\circ}\text{C}$ (5°F)
- EPA recommended a 2°C allowable change for lakes or reservoirs

Temperature: Options

- No change to the current criteria
- Add a new allowable change limit for lakes of 2°C; and designate the current change limit of 3°C for streams only

Additional Issues

Our Vision: Healthy Kansans living in safe and sustainable environments



Topics Presented by KDHE

- Atrazine aquatic life criterion
- Chloride aquatic life criterion
- Copper Biotic Ligand Model
- Mixing zone for all uses

Topics Presented by Focus Group

- Loophole between point source and non-point source needs to be closed
- Surface waters should be redefined to include the words “regardless of classification”
 - Require Legislative action to amend Statute
- The current mixing zone policy is inadequate to protect aquatic and other uses
- The frequency of excursions above aquatic life criteria seems high

Topics Presented by Focus Group

- Mixing zones allowed into classified lakes inadequately provide protection from nutrient loading
- Suspension of numeric surface water criteria when stream flow is less than the critical flow fails to protect the designated uses
- The Secretary of KDHE should not be allowed to exempt low flow classified streams from numeric bacteria criteria

Topics Presented by Focus Group

- KSWQS allow existing artificial sources to be grandfathered into the new standards
- KDWQS ineffectively deal with suspended solids
- The current criteria and testing methods need to be up to date to EPA's most current standards and recommendations

Focus Group Voting Result

Chlorophyll-a / Nutrients	16	Bacteria	5
Antidegradation	12	Temperature	4
Duration & Frequency	8	Chloride	3
Dissolved Oxygen	7	Mixing Zone	3

Contact Information

KDHE BOW Website

www.kdheks.gov/water

Yan Wang 785-296-5508

ywang@kdheks.gov

Mike Tate 785-296-5504

mtate@kdheks.gov

