



## ▶ Today's Presenters

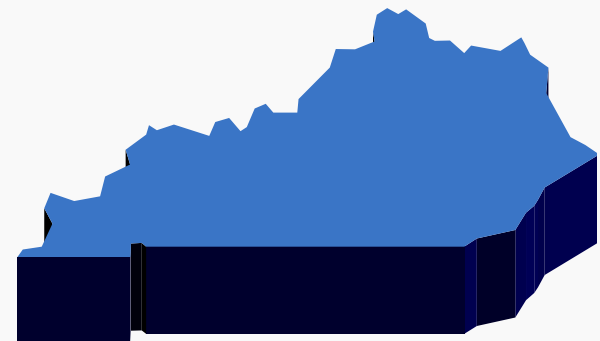
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## ► Objectives

- Review current nutrient criteria and water quality standards in Kentucky
- Identify policies and proposed legislation in KY and surrounding states
- Discuss what the Division of Water's "Nutrient Management Strategy" tells us about DOW's plans
- Discuss potential outcomes
- Evaluate how Kentucky's solution might affect industries, municipalities, agricultural operations and others in the Commonwealth
- Describe the potential impacts on KPDES permitting and compliance



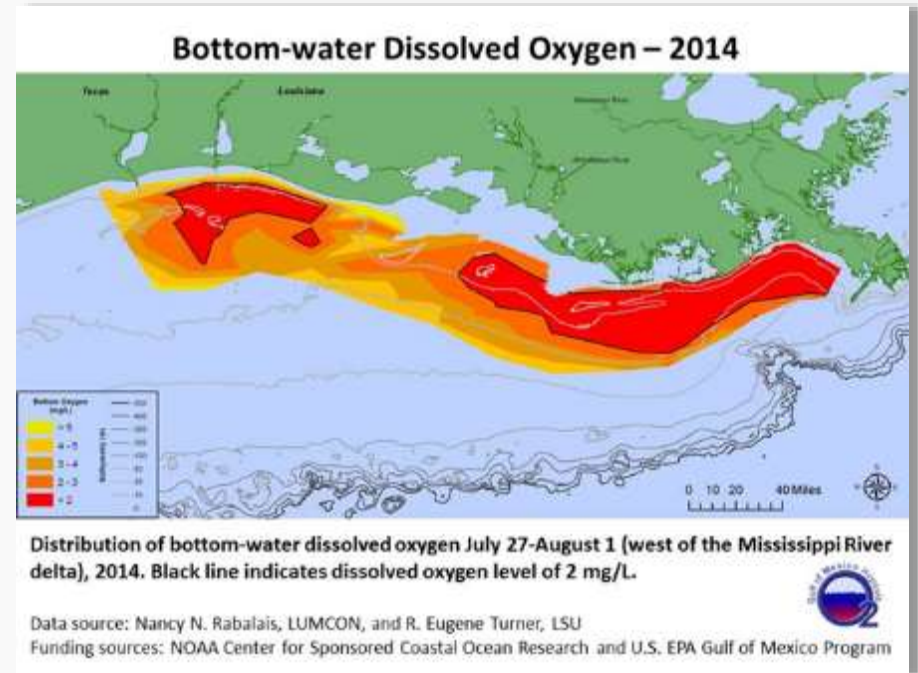


# INTRODUCTION

## ► Why regulate nutrients?

### Northern Gulf of Mexico Dead Zone (a.k.a. Hypoxic Zone or Hypoxia Areas)

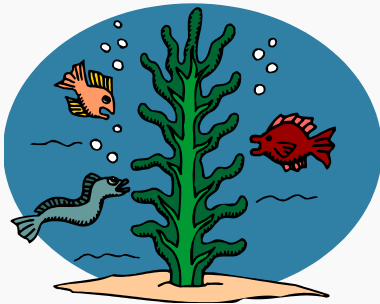
- Fueled by nutrient loadings primarily from forms of nitrogen and phosphorus delivered by the Mississippi River watershed to the gulf.
- Sources: agriculture and other human activities
- Nutrient loading stimulates overgrowth of algae
- Algae die and decompose on the seafloor
- Decomposition by bacteria ultimately consumes the oxygen in the bottom waters needed to support life
- Threatens commercial and recreational Gulf fisheries
- Hypoxic Zone waters have DO conc. of  $< 2$  mg/L
- Largest dead zone was reported 2002 to be 8,481 square miles
- The NOAA data released on 8/4/2014 mapped the current dead zone at 5,052 square miles



# INTRODUCTION

## ► Why regulate nutrients?

- Several Kentucky lakes have potentially harmful algal blooms (HABs) at levels that exceed recommended safety thresholds
- Visitors should be aware of potential health issues and take precautions
- Toxins may be hazardous; people with asthma, children, and pets should avoid contact with infested waters



### Potentially Harmful algal blooms identified in several Kentucky lakes

Posted on July 19, 2014

#### *Division of Water advises lake visitors to make informed decisions*

The Kentucky Division of Water (DOW) and the U.S. Army Corps of Engineers (USACE) have confirmed the presence of potentially harmful algal blooms (HABs), or cyanobacteria at levels exceeding recommended safety thresholds at several lakes in Kentucky. These lakes include Barren River Lake, Nolin Reservoir, Green River Lake, Rough River Lake, Taylorsville Lake and Greenbriar Creek Reservoir in Montgomery County. Cell counts at one site at Taylorsville Lake exceeded 1,000,000 cells/ml. The World Health Organization has determined that "moderate probability of experiencing adverse health effects" exists when cyanobacteria cell counts exceed 100,000 cells/ml. The Department of Public Health, the Kentucky Department of Fish and Wildlife, the Department of Parks, and other stakeholders have been informed of these conditions.

These lakes remain open to the public. Visitors should be aware of the potential health issues and take precautions.

The following guidelines are recommended to avoid exposure to HABs:

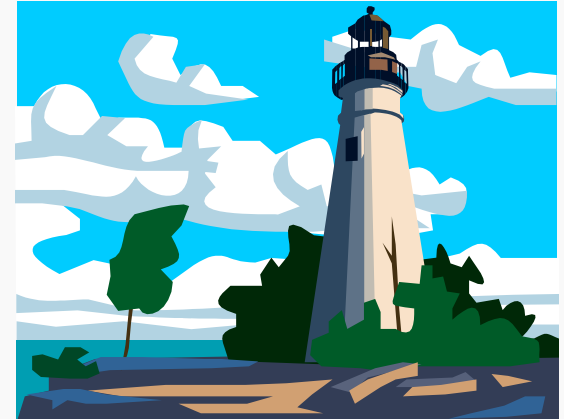
- Direct contact with affected water, including swimming, wading, fishing, paddling, diving and water skiing may result in symptoms. It is advisable to avoid contact with water that has unusual color or where blue-green bacteria have been identified, even if the water appears to be clear.
- People who are prone to respiratory allergies or asthma should avoid areas with harmful algal blooms. Children may be particularly sensitive.
- If contact has been made with water containing blue-green algae, wash off with fresh water. In some cases, skin irritation will appear after prolonged exposure. If symptoms persist, consult your local health care provider.
- Fish filets (not organs) may be consumed after the filets have been rinsed in clean, non-lake water. It is advisable to wash any parts of your body that have come into contact with the fish.
- Prevent pets and livestock from coming into contact with HAB-infested waters.

Source: KY DEP

## ► Why regulate nutrients?

### Toledo, Ohio Water Supply Contaminated by Algae from Lake Erie

- Water tests revealed microcystin readings in excess of the recommended "DO NOT DRINK" 1 microgram per liter standard.
- City officials advised that consuming the affected water could cause "abnormal liver function, diarrhea, vomiting, nausea numbness or dizziness."
- Residents were also cautioned that attempting to boil and drink the water would only worsen the health effects because it would "increase the concentration of the toxins."
- The toxins come from a growing algae bloom on Lake Erie. Lake Erie provides water to more than 11 million people, including major cities like Toledo, Cleveland, Buffalo and Detroit.







# ▶ CURRENT NUTRIENT CRITERIA

## ▶ Kentucky's Water Quality Standards

### 401 KAR 10:031, Section 1

- Nutrient standard is narrative
- What nutrients are regulated?
  - Nitrogen
  - Phosphorus
- Eutrophication is defined at 401 KAR 10:001, Section 1(30)
  - Can result in death of aquatic species, impair aquatic habitat and increase turbidity in the water.





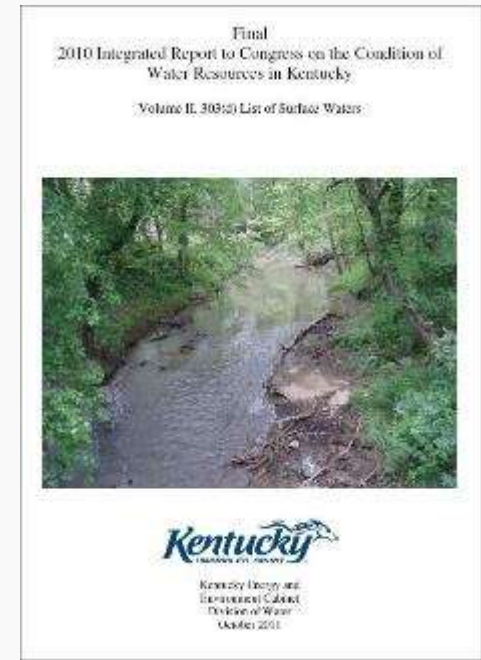
# CURRENT NUTRIENT CRITERIA



## ▶ Application of the narrative standard

### What is the evidence of a eutrophication problem?

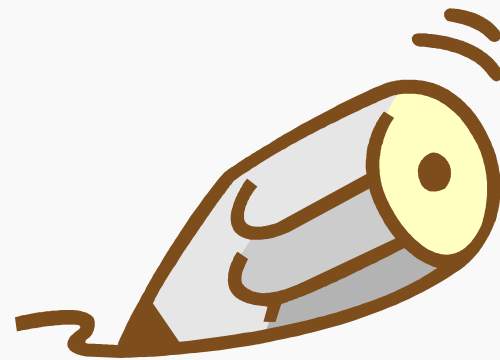
- 2010 303(d) List of Surface Waters
  - Total Waters = 49,105 miles
  - Assessed Waters = 10,773.9 miles
  - Impaired Waters = 6,877.5 miles
  - Nutrient Impaired Waters = 2,928.2 miles



## ▶ Application of the narrative standard

### The Division of Water's numerical response to nutrient-impaired waters:

- “DOW has implemented total phosphorus limitations of 1.0 mg/l as a monthly average and 2.0 mg/l as a weekly average for Waters of the Commonwealth that are impaired for nutrients. DOW has applied these limitations to permits addressing discharges to streams with nutrient/eutrophication biological impairment conditions. DOW is currently evaluating data for developing nitrogen criteria.”
- These technology-based limits were determined based on non-water quality based effluent limitations for phosphorus promulgated by the state of Wisconsin.





# POLICIES AND PROPOSED LEGISLATION



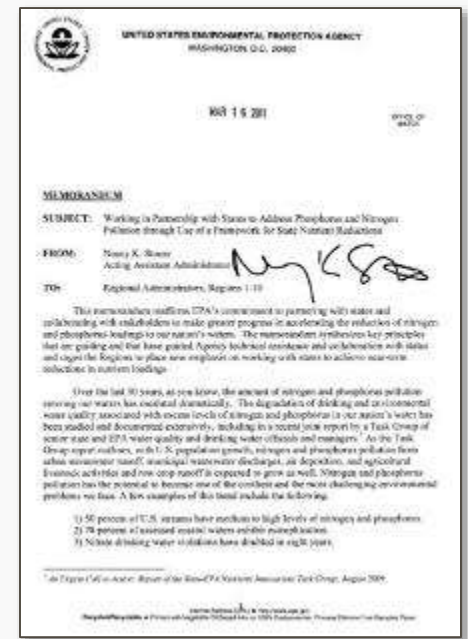


# POLICIES AND PROPOSED LEGISLATION

## ► Background: EPA Stoner Memorandum (March 16, 2011) (Not a regulation)

The EPA defined the problem as increasing nitrogen and phosphorus pollution resulting from:

- Urban stormwater runoff
- Municipal wastewater discharges
- Air deposition
- Agricultural livestock activities
- Row Crop Runoff



## POLICIES AND PROPOSED LEGISLATION

- ▶ EPA Stoner Memorandum (March 16, 2011)
- Resultant examples of this increasing rise in nitrogen and phosphorus pollution include:**
- 50% of US streams have medium to high levels of nitrogen and phosphorus
  - 78% of assessed coastal waters exhibit eutrophication
  - Nitrate drinking water violations have almost doubled in the last eight years
  - USGS reported that nitrates exceeded background concentrations in 64% of shallow monitoring wells
  - Frequency of Algal blooms are steadily rising



## ▶ EPA Stoner Memorandum (March 16, 2011)

### What's the solution?

- Development of state frameworks for managing nitrogen and phosphorus pollution
- Prioritize watersheds on a state-wide basis and promote adoption of most effective agricultural practices
- Develop load-reduction goals
- Numeric nutrient criteria targeted at different categories of water bodies.





# POLICIES AND PROPOSED LEGISLATION

## ► Hypoxia Task Force

### Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

- Covers the Mississippi/Atchafalaya River Basin
- Implementation of the Gulf Hypoxia Action Plan (2008) continues for the Mississippi/Atchafalaya River Basin

### Participating organizations in the task force:

- Iowa; Mississippi; Minnesota; Louisiana; Missouri; Indiana; Illinois; Wisconsin; **Kentucky**; Tennessee; Arkansas; Ohio
- EPA; Department of Agriculture, Research, Education, and Economics; Department of the Interior; Army Corps of Engineers; National Oceanic and Atmospheric Administration; National Tribal Water Council

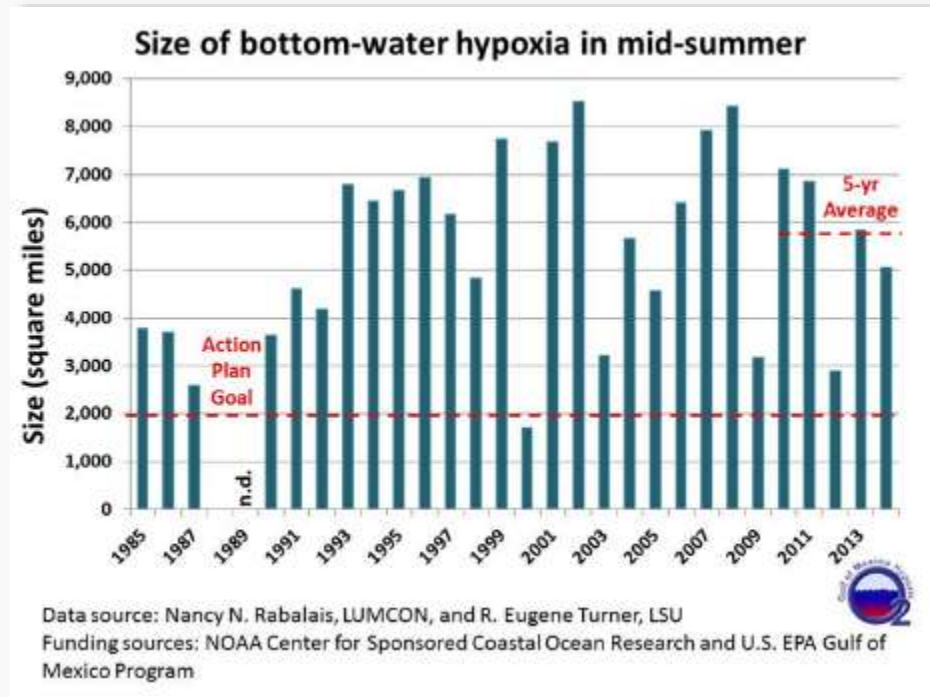


# POLICIES AND PROPOSED LEGISLATION

## ▶ Gulf Hypoxia Action Plan 2008

### Three Overall Goals

- Coastal Goal: Reduce the five-year running average areal extent of the Gulf of Mexico hypoxic zone to less than 5,000 km<sup>2</sup> (~1,930 mi<sup>2</sup>) by 2015. Current Five-Year average is approx. 5,500 mi<sup>2</sup>.
- Within Basin Goal: Implement nutrient and sediment reduction actions to protect public health and aquatic life as well as reduce negative impacts of water pollution on the Gulf of Mexico.
- Quality of Life Goal: Improve communities and economic conditions across the basin for agriculture, fisheries, and recreation through public and private land management and a cooperative incentive-based approach.

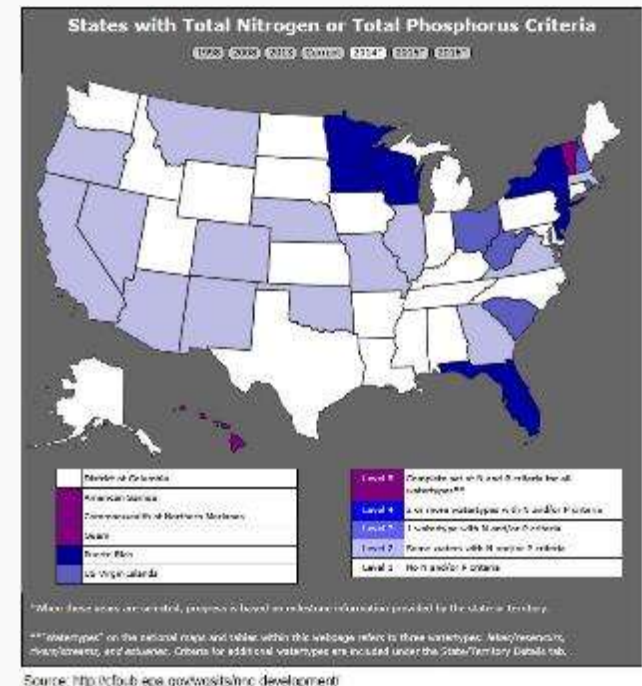


# POLICIES AND PROPOSED LEGISLATION

## ▶ Do other states have numeric nutrient criteria?

### Ahead of the curve:

- Florida
  - Statewide P/N criteria for lakes and estuaries
  - Statewide P/N criteria for streams
- Wisconsin
  - Statewide P criteria for lakes, reservoirs, rivers and streams
  - Set point source effluent limitations for P
  - Tightened agricultural performance standards for nonpoint sources to curb excess P usage
- West Virginia
  - Statewide P criteria for warm water and cool water lakes/reservoirs
- Ohio?
  - P/N criteria in the works; however, self-identified milestones have been missed







# POLICIES AND PROPOSED LEGISLATION

## ► What about Kentucky?

### Milestone Information – Development of Statewide N/P Criteria

Watertype	N/P	1. Planning for Criteria Development	2. Collection of Information & Data	3. Analysis of Information & Data	4. Proposal of Criteria	5. Adoption of Criteria (EPA-Approved)
Lakes/Reservoirs	N	Complete	No Date Provided	TBD*	12/31/2018	12/31/2018
Lakes/Reservoirs	P	Complete	No Date Provided	TBD*	12/31/2018	12/31/2018
Rivers/Streams - Non-Wadeable	N	Complete	Collection Underway	TBD*	TBD	TBD
Rivers/Streams - Non-Wadeable	P	Complete	Collection Underway	TBD*	TBD	TBD
Rivers/Streams - Wadeable	N	Complete	Collection Underway	TBD*	12/31/2016	12/31/2018
Rivers/Streams - Wadeable	P	Complete	Collection Underway	TBD*	12/31/2016	12/31/2018

- Baseline information provided to EPA on July 1, 2012.







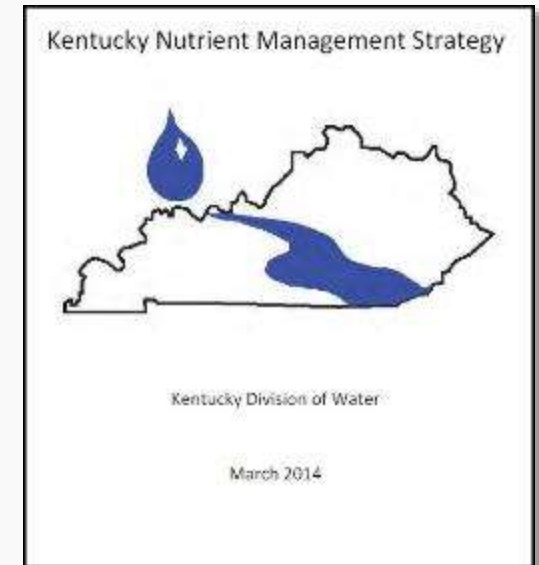


# Kentucky's Nutrient Management Strategy

## ▶ What is the strategy?

### Methods of Addressing Nutrients

- Total Maximum Daily Loads (TMDLs) / Watershed based plans
- Effluent requirements
- Agricultural Water Quality Act
- Planning (Triennial Review) / Policy (401 KAR 10:031)
- Regional Facility Plans
- Funding
- Education
- Partnerships with state and federal agencies

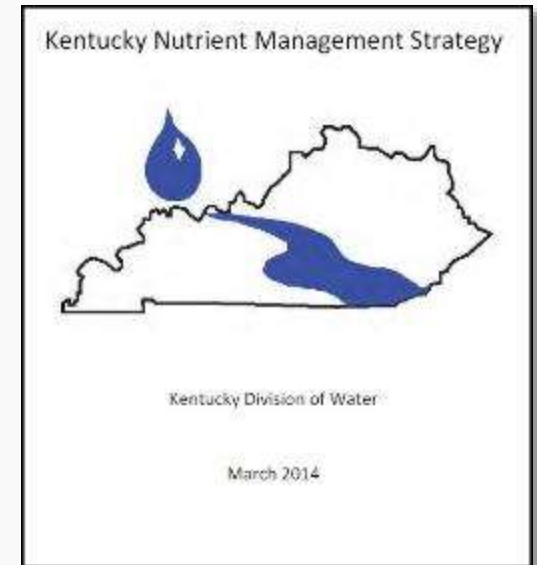


# Kentucky's Nutrient Management Strategy

## ► What is the strategy?

### Goals for the Future

- Assessment of watersheds
  - Monitoring
  - Prioritization
- Source Specific Strategies
  - Point Sources
  - Agriculture
  - Other nonpoint source pollution
  - Trading
  - Education
- Document and Verify Progress
  - Success Monitoring
  - Reporting





# ▶ POTENTIAL OUTCOMES

BOOK 551 PAGE 500  
STATE OF *Kentucky*

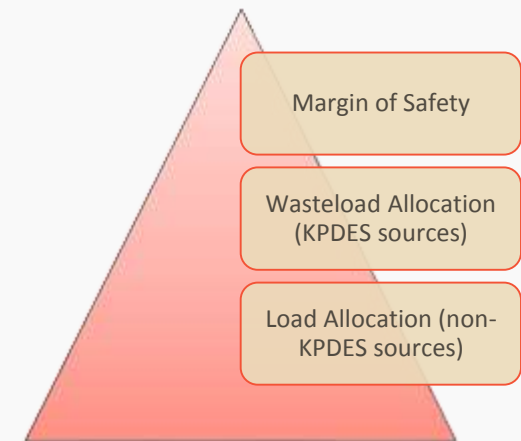


## ▶ Total Maximum Daily Loads (TMDLs)

### Floyds Fork

- 284 square miles in Henry, Oldham, Shelby, Jefferson, Spencer, and Bullitt counties
  - Floyds Fork Watershed TMDLs are under development for fecal coliform, nutrients, organic enrichment, and dissolved oxygen impairments
  - Potentially impacted sources of nutrients include public and private wastewater, agriculture, and urban runoff

### Components of a TMDL



## ► Effluent Requirements / Discharge Limits

### Kentucky

- P limits for municipal WWTP discharges to nutrient-impaired waters are 1 mg/l as a monthly average and 2 mg/l as a weekly average
  - All municipal dischargers are currently required to monitor P and N
- Will we see a one size fits all or case-by-case solution?

### Florida

- Limits for rivers/streams range from 0.05 to 0.67 mg/l for P and 1.03 to 1.87 mg/l for N
  - Annual geometric mean concentrations shall not exceed the criterion more than once in any three calendar year period
- Limits for lakes/reservoirs range from 0.01 mg/l to 0.05 mg/l for P and 0.51 mg/l to 1.27 mg/l for N

### Wisconsin

- P limits are 100 µg/l for listed rivers/streams and 75 µg/l for all others
- P limits for lakes/reservoirs range from 5 µg/l to 40 µg/l

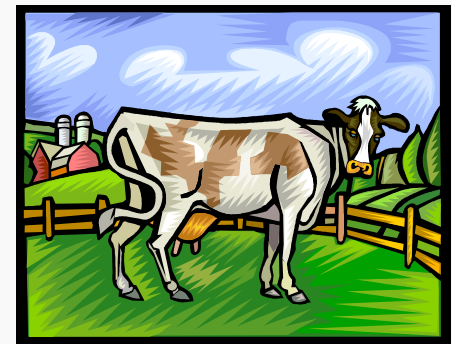
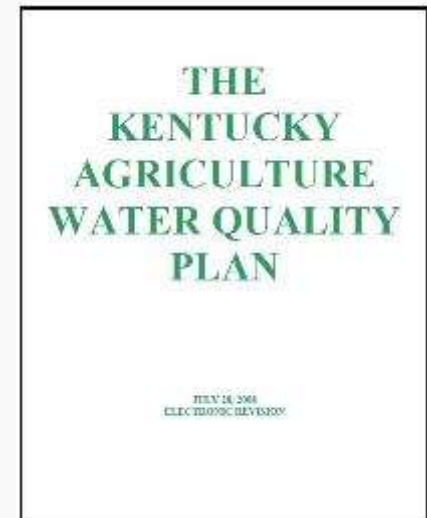


# POTENTIAL OUTCOMES

## ▶ Agricultural Water Quality Act

### KRS 224.71-100 through 224.71-145

- Act provides authority to evaluate, develop, and improve best management practices, establish statewide and regional agriculture water quality plans, and promote soil and water conservation activities
- DOW shall monitor trends in state water quality and identify priority areas where agriculture is contributing to water quality pollution
- Noncompliance with the Act
  - Compliance plan with corrective measures and timeline
  - Loss of eligibility for further financial assistance







# ▶ HOW WILL KENTUCKY'S STRATEGY AFFECT YOU?



# POTENTIAL IMPACTS ON KPDES PERMITTING AND COMPLIANCE

## ▶ Who will be impacted?

### Municipalities

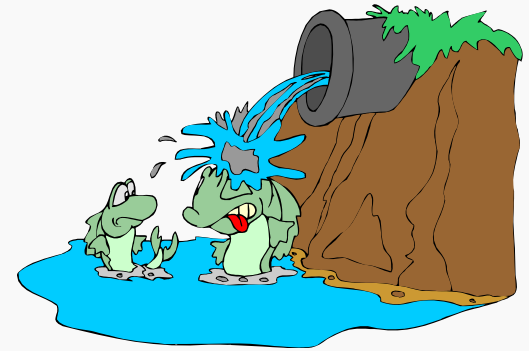
- As Kentucky's streams are assessed, more nutrient-impaired waters will be identified
- P and N limits will likely become much more stringent in KPDES and MS4 permits
- Municipalities may address this similar to the Chesapeake Bay Watershed where cities have required reformulation of fertilizers for property owners

### Industries and Commercial Establishments

- Pretreatment industries and commercial establishments will be indirectly impacted by the municipality's discharge limits
- A discharge that causes interference at or disrupts the WWTP, its treatment processes or operations, or its sludge processes is a violation of the municipality's KPDES permit

### Agriculture

- Concentrated Animal Feeding Operations (CAFOs)
- Nonpoint sources of nutrients will be addressed at some point



# HOW WILL KENTUCKY'S NUTRIENT STRATEGY AFFECT YOU?

## ▶ Who said it?

### Why are we proposing to adopt nutrient standards?

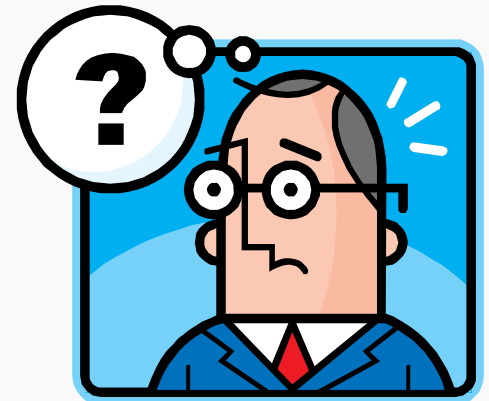
- Prolonged delays in rule adoption efforts could lead to actions by US EPA to promulgate standards. These standards would almost certainly be less flexible and result in more extensive business impacts compared to the approaches under consideration.

### Who will be directly regulated by this rulemaking?

- Entities that discharge nutrients, include municipalities, industries, commercial facilities and concentrated animal feeding operations.

### Who will be indirectly affected by this rulemaking?

- Everyone who expects and depends upon clean water that is useable for drinking, recreation and industrial purposes. Drinking water utilities, tourism and water based recreation businesses have the most obvious interests.





# HOW WILL KENTUCKY'S NUTRIENT STRATEGY AFFECT YOU?

## ► What can you do?

### Begin to look for:

- Characterize your discharge and address potential sources of nutrient pollution
- Identify nutrient-impaired streams and streams with TMDLs near your city/facility
- Cost effective procedures for upgrades or changes to the wastewater treatment system
  - Retention pond
  - Biofilter/grass swale
  - Porous pavement
- Review nutrient BMPs on a regular basis
- Assess current BMPs to determine their effectiveness
- Establish community workgroups to address the reduction of nutrient sources to impaired streams prior to development of TMDLs



QUESTIONS?





▶ **THANK YOU**  
from Smith Management Group

[www.smithmanage.com](http://www.smithmanage.com)

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STATE OF *Kentucky*

A decorative banner at the bottom of the slide features a collage of images related to construction and infrastructure, including a bridge, a crane, and a building. The text "STATE OF" is visible in white, followed by the word "Kentucky" in a red, cursive script.