



# DRAFT 2016 303(d) LIST

Office of Water

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ARKANSAS  
Department of Environmental Quality

# Presentation Outline

- 1) CWA Reporting Requirements
- 2) Designated Uses/Criteria
- 3) Monitoring Networks/Parameters
- 4) Assessments
- 5) Reporting of Assessments
- 6) 2016 Updates

# Clean Water Act Reporting Requirements

## Water Quality Monitoring Report

Required by Section 305(b)

- Assessment of Rivers and Streams
- Assessment of Lakes and Reservoirs
- Assessment of Ground Waters
- Report on the water quality condition
- List of waterbodies not meeting water quality standards or designated uses (**303(d) List**)

# What is the 303(d) List?

- List of waterbodies currently not
  - Supporting designated uses or
  - Attaining water quality standards
- ADEQ must submit a 303(d) list every 2 years
- For listed waters, ADEQ must, with EPA concurrence, develop water quality improvement strategies to reduce the input of the specific pollutant(s) that are restricting the waterbody use(s) in order to restore and protect the use(s).

TMDLs, Watershed Restoration Plans, NPDES  
Permit Limits, additional monitoring

# Section 303(c) of the Clean Water Act

- States are required to adopt water uses (Designated Uses) consistent with the Clean Water Act
- States are required to establish water quality standards for waterbodies
- Water quality standards define the goals for waterbodies in the state by designating uses for each waterbody and setting criteria necessary to protect the uses

# Assessed Designated Uses Include

- Fisheries (Aquatic Life)
- Primary Contact Recreation (Swimming)
- Secondary Contact Recreation (Wading)
- Domestic Water Supply (Drinking Water)
- Agriculture and Industrial Water Supply
- ❖ Fish Consumption - not a designated use

Based on the designated uses, water quality criteria are established for each waterbody

# Water Quality Criteria

## EXAMPLES INCLUDE

- Numerical criteria, Regulation 2.504 for pH:  
pH values for water in streams/lakes shall not be below 6.0 or above 9.0

- Narrative criteria, Regulation 2.509 for nutrients:

Nutrients – ‘Materials stimulating algal growth shall not be present in concentrations sufficient to cause objectionable algal densities or other nuisance aquatic vegetation or otherwise impair any designated use...’

# History of 303(d) List Arkansas

- ADEQ began documenting water quality conditions in the late 1960's
- Arkansas began reporting the conditions of the State's waters to EPA as a requirement of Section 305(b) of the Clean Water Act in the early 1970s
- ADEQ began officially submitting a 303(d) list in 1992



# Inventory of Quality of All Waters of the State

## Four Water Quality Monitoring Networks

- Ambient Water Quality Monitoring Network
- Special Studies
- Lakes Water Quality Monitoring Network
- Groundwater Quality Monitoring Network

# Water Quality Monitoring Network

## AMBIENT SURFACE WATER NETWORK

- Approximately 150 stations
- Chemical parameters and flow (when available)
- Sampled monthly for approximately 30-35 years
- Monitoring objectives
  - Big river systems
  - Below point source discharges
  - Potentially problematic nonpoint source areas
  - Least-disturbed reference streams
  - Consistent long-term monitoring

# Water Quality Monitoring Network

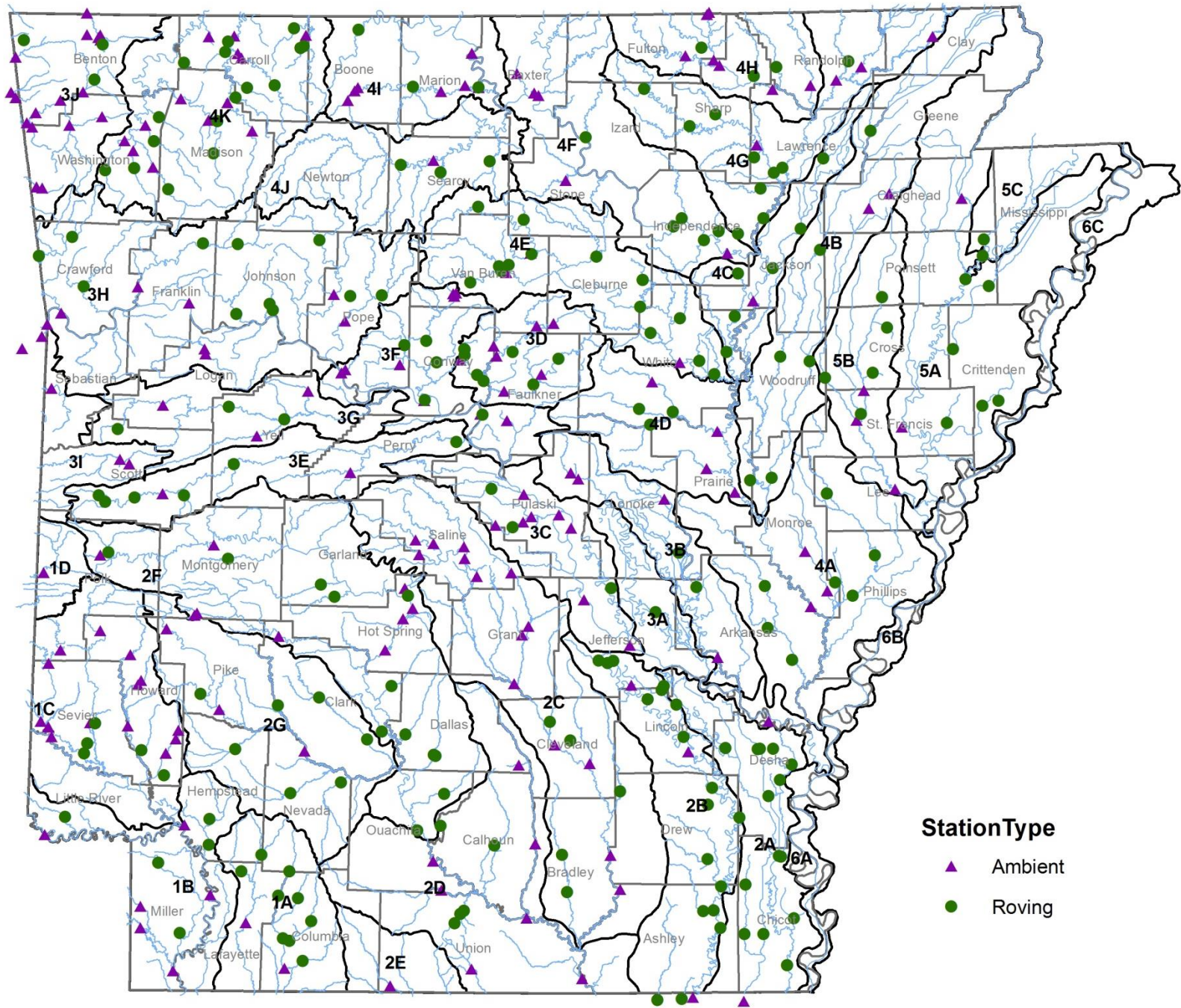
## CHEMICAL ANALYSES

### ➤ Routine Analyses

- Conventional parameters (pH, D.O., Temp.)
- Minerals (Cl, SO<sub>4</sub>, TDS)
- Nutrients (forms of N and P)
- Heavy metals (Cu, Zn, Pb, etc.)
- Other associated ions (Na, Ca, K, etc.)

### ➤ Periodic Analyses

- Standard Pesticide Scan (approx. 40 compounds)
- Specialized chemical compounds



### StationType

- ▲ Ambient
- Roving

# Water Quality Monitoring Network

## WATERSHED MONITORING NETWORK

### Macroinvertebrate Community

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Watershed Based: 20 – 30 sites  
Statewide: 100+ samples/year  
Plus Routine Water Quality Analyses &  
Flow



### Fish Community

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Watershed Based: 10 – 20 sites  
Statewide: 30+ samples/year  
Plus Routine Water Quality Analyses &  
Flow

# Water Quality Monitoring Network

## LAKES AND RESERVOIRS

- 15 lakes sampled quarterly since 2011
- Other lakes sampled regularly in order to:
  - Identify potential reference Lakes
  - Verify reference conditions
  - Collect adequate quantity of data
  - Develop improved water quality standards for lakes

# Ambient Groundwater Monitoring

- Approximately 250 stations
- Selected public and private wells, irrigation wells, industrial supply wells, and springs
- Ions, metals, nutrients, Total Organic Carbon
- Sampled triennially
- Monitoring objectives
  - Major aquifers across Arkansas
  - Document natural background conditions
  - Consistent long-term monitoring
  - Some pesticide/VOC sampling in shallow wells near sources

# Outside Data Utilized

- 24 Entities
  - (Government, Academic, Private)
- Government
  - AG&FC, ANRC, BWD, ADH
  - EPA, USGS, SWP, NPS
  - Cherokee Nation, Mississippi DEQ, Missouri DNR, Missouri DC
- Academia
  - ASU, ATU, UCA, UALR, UAPB, AWRC
- Private
  - Equilibrium, GBM<sup>c</sup>, FTN, CH2M Hill, AquaTerra
  - Northbrook Power Management



# Assessment Criteria

5-year period of record 4/1/2010 – 3/31/2015

Metals – 3-year period of record 4/1/2012 – 3/31/2015

Parameter	Support	Non-support
Temperature	$\leq 10\%$	$> 10\%$
DO	$< 5$ samples or $\leq 10\%$	$> 10\%$
pH	$\leq 10\%$	$> 10\%$
Turbidity	$\leq 25\%$	$> 25\%$
Metals	$< 2$ exceedances	$> 1$ exceedance

Example: 60 Temperature measurements were taken at a station representing a particular stream segment during the period of record.

If 6 samples exceed the criteria  **SUPPORT**

If 7 samples exceed the criteria  **NON-SUPPORT**

**WADEABLE STREAM/RIVER NUTRIENT SCREENING CRITERIA**

Are mean total phosphorus and/or mean total nitrogen concentrations for a monitoring segment greater than the 75th percentile of the given ecoregion during the period of record?

No

Support

Yes

**NUTRIENT ASSESSMENT CRITERIA**

Does the monitoring segment have paired<sup>1</sup> biological collections AND two separate 72-hour diurnal data sets<sup>2</sup>?

No

Insufficient data

Yes

Do both of the two 72-hour data sets have any 2 of the 4 water quality translators exceeded?  
Dissolved oxygen concentrations fluctuation (amplitude) >3mg/L  
Dissolved oxygen below applicable standard for >4 consecutive hours  
Dissolved oxygen percent saturation >125% for >4 consecutive hours  
pH <6 or >9

No

Support

Yes

Are biological assemblages impaired<sup>3</sup>?

No

Support

Yes

One Assemblage

Non-support

Two Assemblages

Non-support

Nutrient  
Screening  
Criteria

# 303(d) Report Listing Format

## Five Assessment Categories of Waters

### 1 – Waterbody not impaired

1a – All designated uses and water quality standards are attained.

1b – All designated uses and water quality standards are attained,  
but a TMDL exists for at least one water quality parameter.

### 2 – Some uses and standards met, however there is insufficient data to assess other uses.

### 3 – Insufficient data to assess any uses

### 4 – Waterbody impaired, does not require TMDL

4a -TMDL has already been completed

4b – Other pollution control requirements will result  
in WQ standards attainment

4c – Impairment is not caused by a pollutant

# 303(d) Report Listing Format

## Five Categories of Waters (continued)

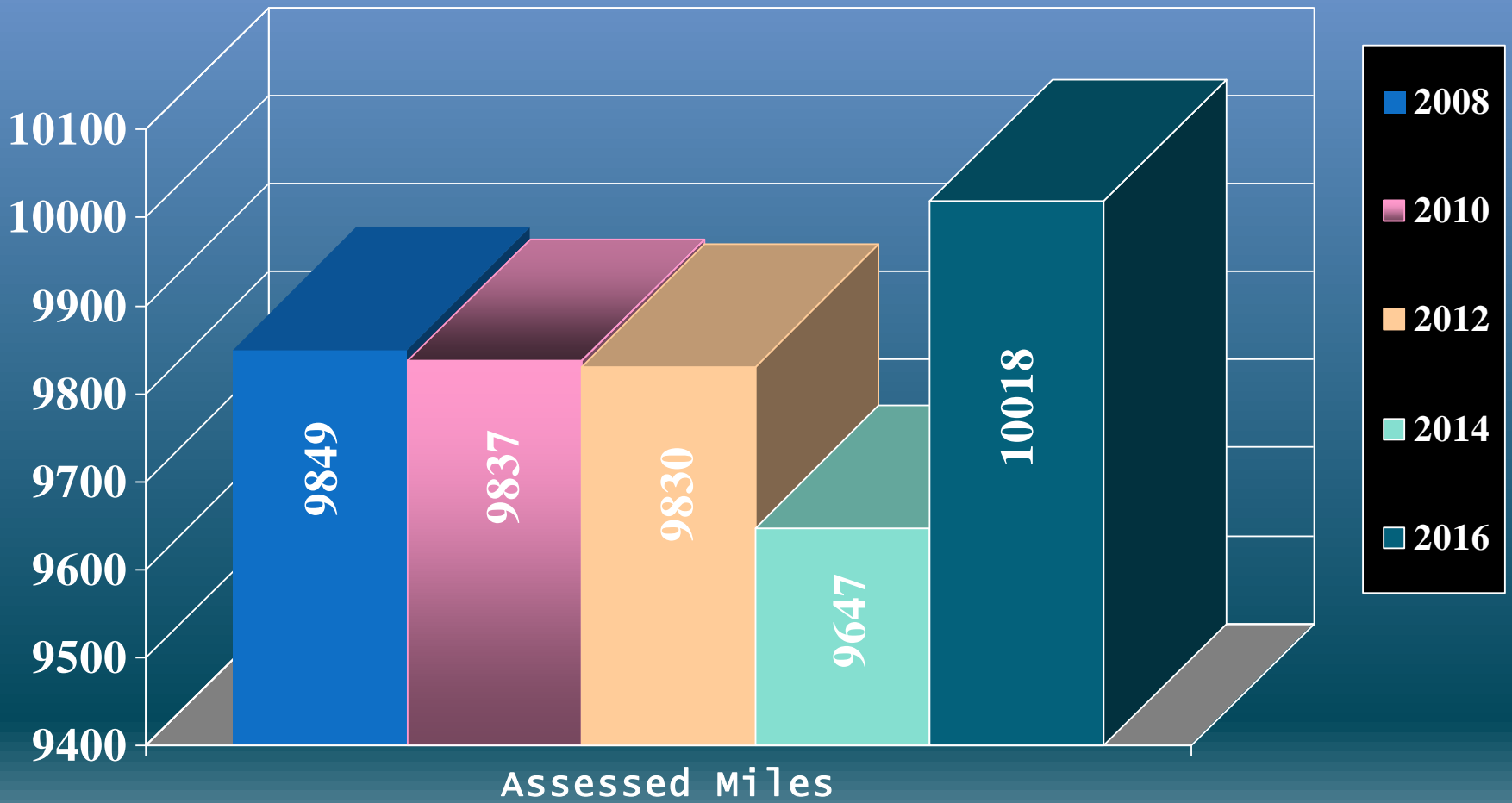
### 5 – Waters not meeting WQ Standards

- High
  - Truly impaired, TMDL needed
- Medium
  - Adoption of new regulations or standards
  - Questionable data (QA/QC)
  - Data verification needed
  - Impairment caused by a point source
- Low
  - Impairment is naturally occurring
  - Segment added by EPA

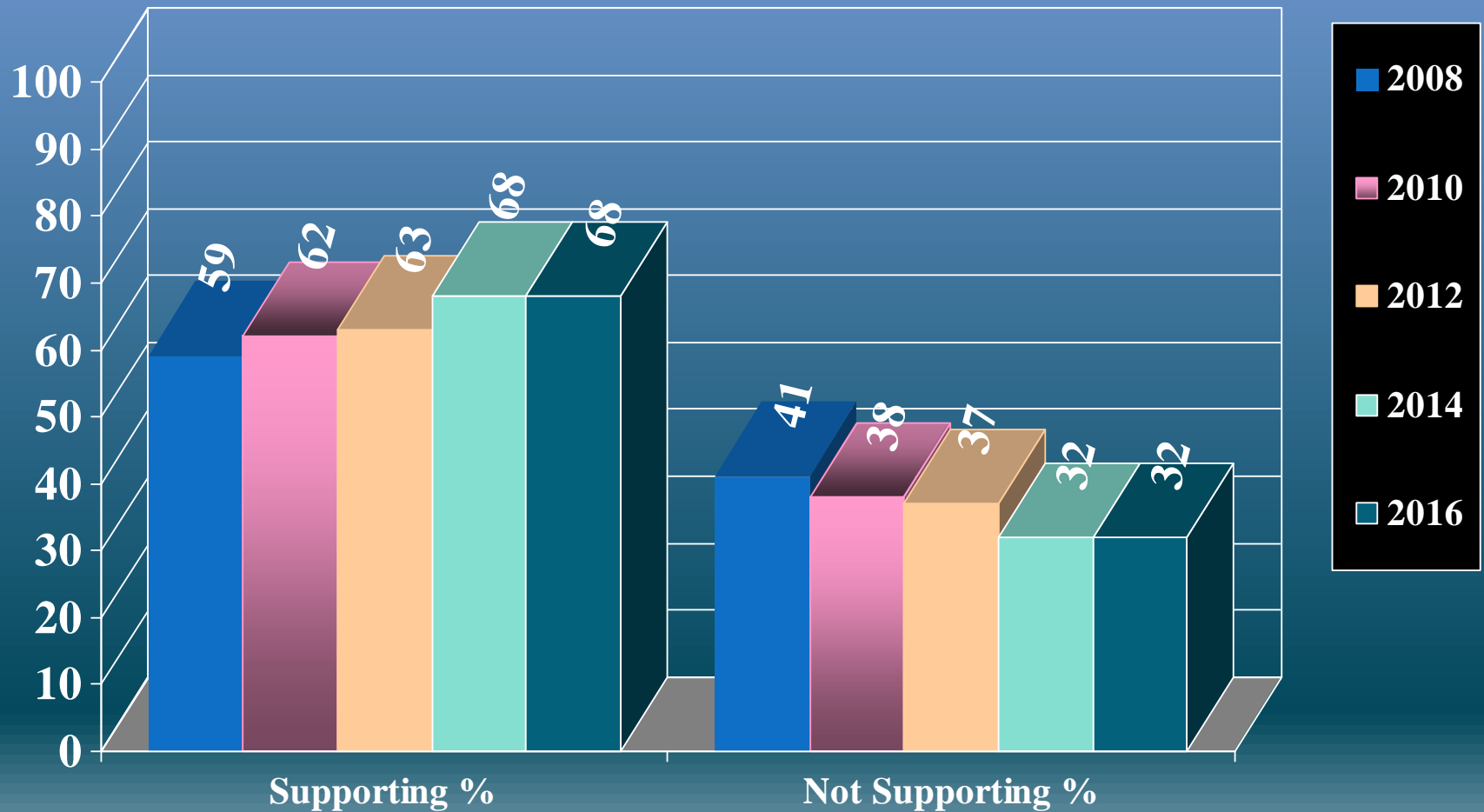
# Prioritization of Category 5 Waters

- **Primary Factors**
  - Drinking Water Sources
  - Extraordinary Resource Waters
  - Ecologically Sensitive Waters
  
- **Secondary Factors**
  - Proximity to other listed waters
  - Complexity of the project
  - Cause for listing

# 2016 MILES ASSESSED



# 2016 Designated Use Support & Water Quality Standards Attainment



# New Listings for 2016

## 72 Pollutant Pairs

- Minerals - Cl, SO<sub>4</sub>, TDS (19)
- Turbidity (3)
- Dissolved Oxygen (26)
- Metals - Cu, Pb, Zn, Se (13)
- Temperature (3)
- Pathogens (1)
- pH (7)



# De-Listing of Waters

- Development of a TMDL
- Implement control strategies other than a TMDL
- Updated assessments indicate no known impairments
- Improved delineation of impaired waterbodies
- Revised water quality standards and assessment methodologies


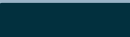
# De-Listings for 2016

## 98 Pollutant Pairs

- Minerals - Cl, SO<sub>4</sub>, TDS (31)
- Metals - Cu, Pb, Zn (27)
- Turbidity (20)
- pH (8)
- Dissolved Oxygen (4)
- Temperature (8)
- Pathogens (0)

# Draft 2016 Category 5 pH Impairments



-  Draft 2016 Category 5 pH Stream Impairments
-  Draft 2016 Category 5 pH Lake Impairments

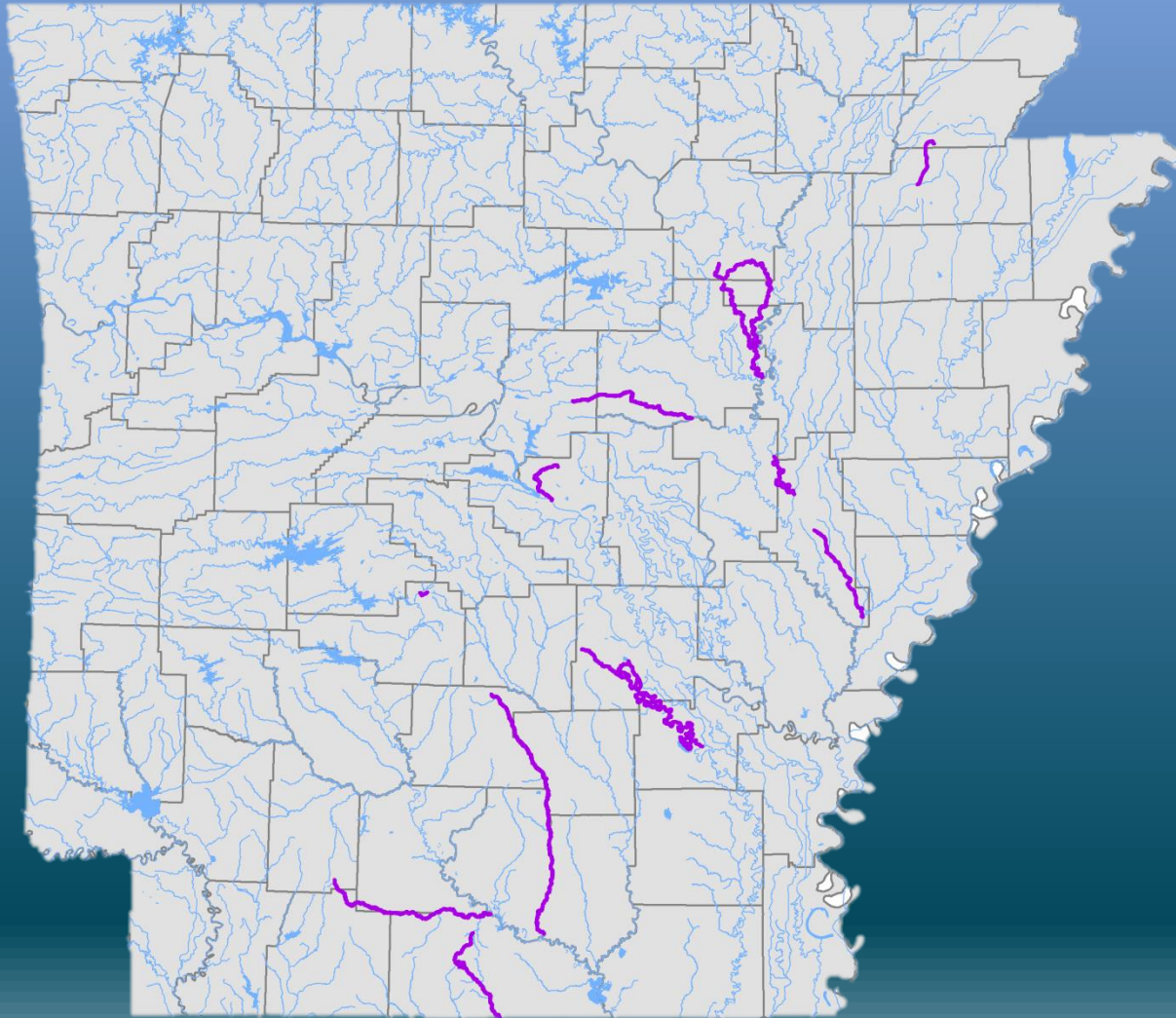
# Draft 2016 Category 5 Dissolved Oxygen Impairments



 Draft 2016 Category 5 DO Stream Impairments

 Draft 2016 Category 5 DO Lake Impairments

# Draft 2016 Category 5 Metals Impairments



Draft 2016 Category 5 Metals (Copper, Lead, Zinc, Beryllium, Selenium) Stream Impairments

Draft 2016 Category 5 Copper Lake Impairments

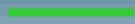
# Draft 2016 Category 5 Minerals Impairments




Draft 2016 Category 5 Minerals (Chlorides, Sulfates, TDS) Stream Impairments

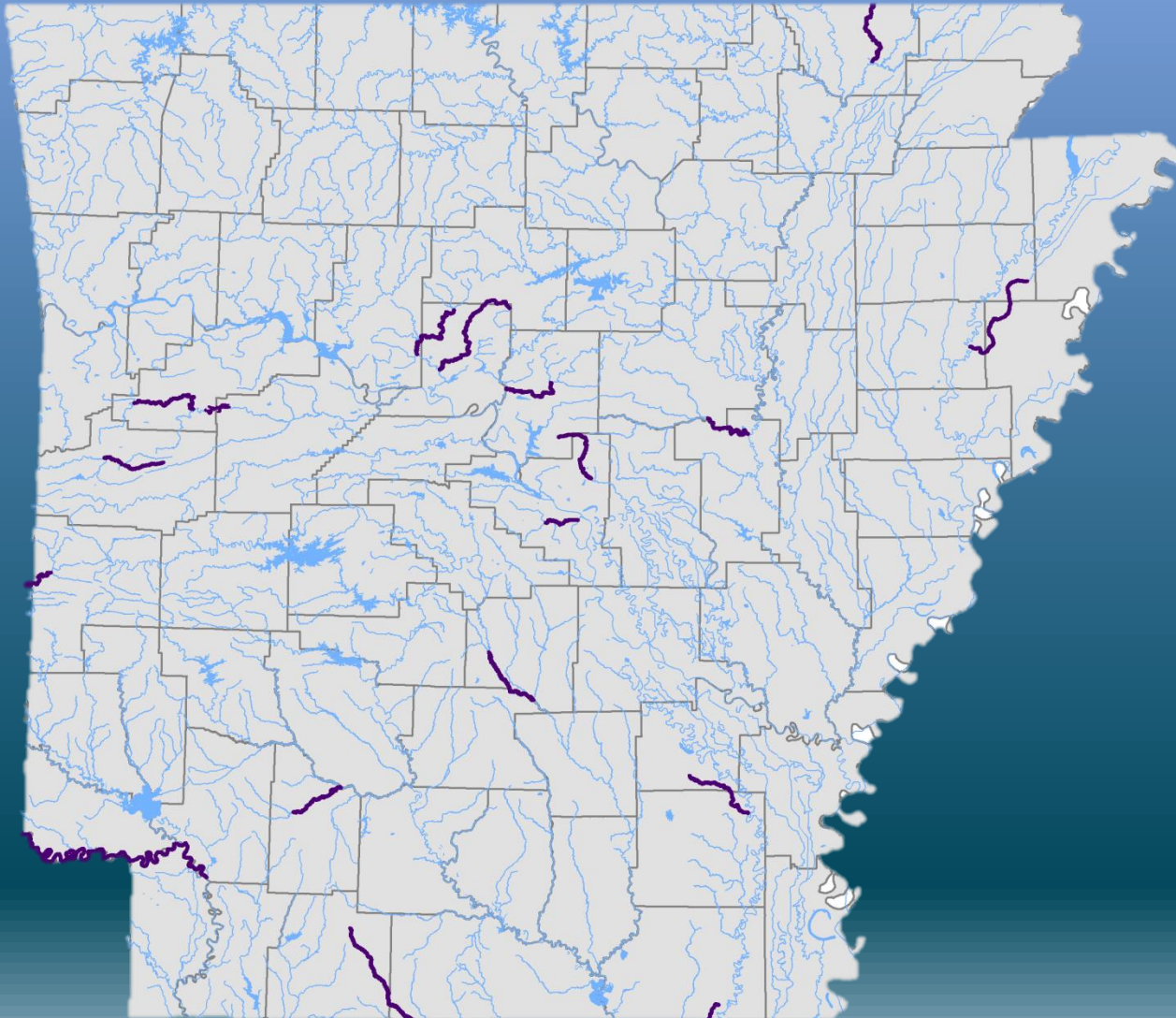
# Draft 2016 Category 5 Pathogen Impairments


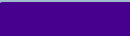


 Draft 2016 Category 5 Pathogen Stream Impairments

 Draft 2016 Category 5 Pathogen Lake Impairments

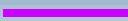
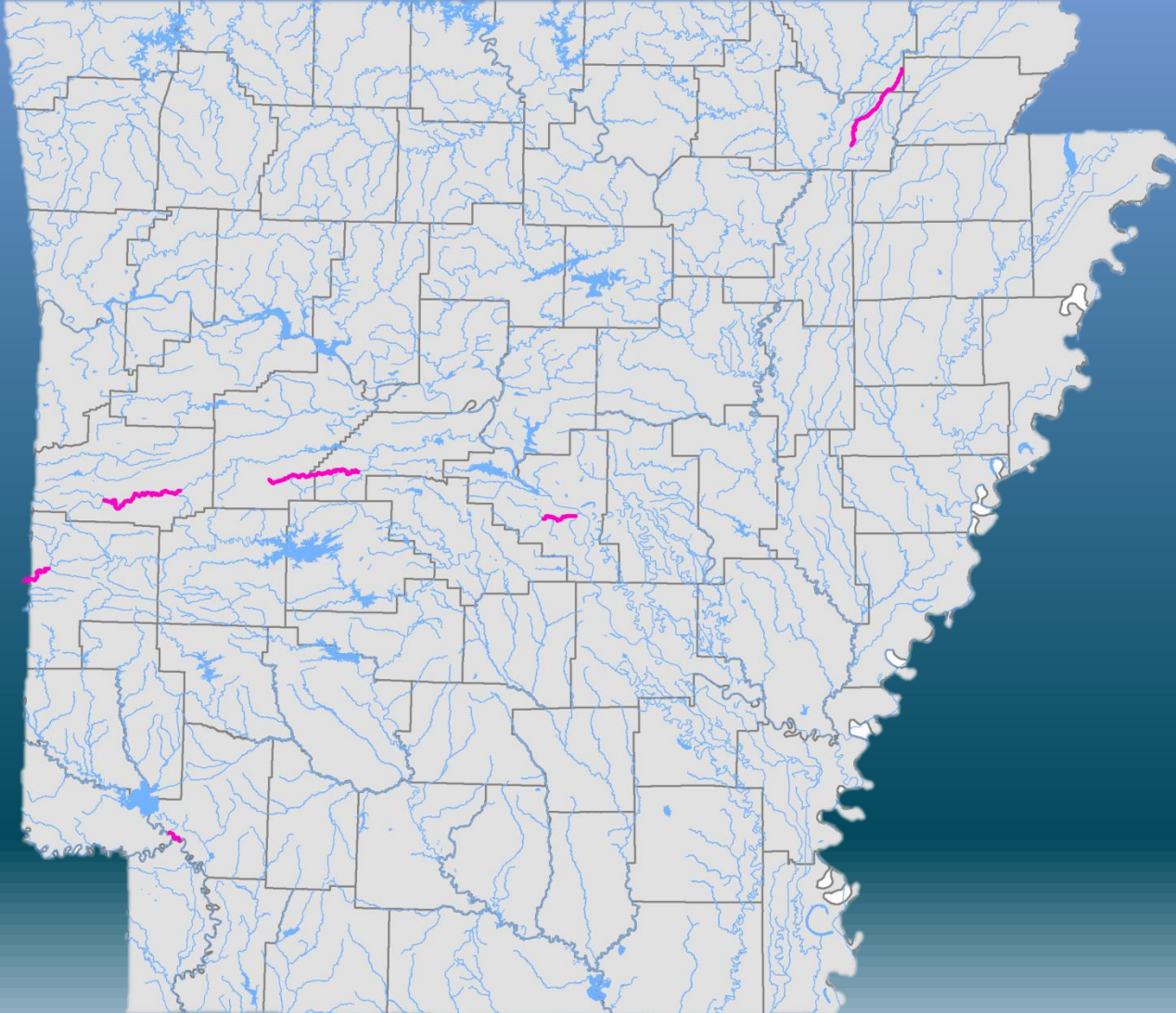
# Draft 2016 Category 5 Silt/Turbidity Impairments



-  Draft 2016 Category 5 Silt/Turbidity Stream Impairments
-  Draft 2016 Category 5 Silt/Turbidity Stream Impairments



# Draft 2016 Category 5 Temperature Impairments



Draft 2016 Category 5 Temperature Stream Impairments

# Total Maximum Daily Load

Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a specific pollutant that a waterbody can receive and still meet its water quality criteria and maintain its designated uses.

$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$

TMDLs become the basis for effluent limitations and discharge permit limits.

WLA = Waste Load Allocation; LA = Load Allocation; MOS = Margin of Safety

# Public Participation

- 45 Day Comment Period
  - Public Comment Period began:
    - Friday, January 16, 2016
  - Public Comment Period ends:
    - Monday, March 11, 2016
- ❖ All comments must be received by 4:30 p.m.  
[ImpairedWaters\\_Comments@adeq.state.ar.us](mailto:ImpairedWaters_Comments@adeq.state.ar.us)



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*"To protect, enhance, and restore  
the natural environment for the  
well-being of all Arkansans."*