*optimizing resources | water, air, earth*

# Why Do You Care About the Clean Water Act?

## Stormwater and NPDES Permitting

**Presented by**
**AquAeTer, Inc.**
**Pamela A. Hoover, P.E.**

# Goal of Today's Presentation

- **To become familiar with:**
  - Components of the Clean Water Act
  - How the CWA protects and improves waterbodies
  - How these goals are being achieved

# Agenda

- History of the Clean Water Act
- What's in the Clean Water Act
- From the Clean Water Act to Discharge Permit and Best Management Practices

# History of the Clean Water Act

- **1948 – Federal Water Pollution Control Act**
- ***1969 – Cuyahoga River Fire***
- **1972 – FWPCA was re-organized**
  - Now referred to as the Clean Water Act
  - Required permits for discharges to waterbodies
  - Established regulatory framework for USEPA oversight and State implementation
- **1977 – Amendments to the Act**
  - Required that conventional, nonconventional, and toxic pollutants be addressed
- **1987 – Amendments to the Act**
  - Addition of stormwater and non-point sources

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# Cuyahoga River Fire

**On June 22, 1969 an oil slick and debris in the Cuyahoga River caught fire in Cleveland, Ohio.**

**This drew national attention to environmental problems in Ohio and elsewhere in the United States and helped lead to the passage of the Clean Water Act in 1972.**

# Richard Nixon Signs the Clean Water Act Enacted on October 18, 1972

# Clean Water Act

- **Objective:**
  - *Restore and maintain the chemical, physical, and biological integrity of the Nation's waters.*
- **Goals**
  - Eliminate discharge of pollutants by 1985
  - Fishable/swimmable waters wherever possible by 1983
  - Toxic pollutant discharge prohibited
  - POTWs constructed
  - Watershed protection
  - Research
  - Control of point and non-point discharges

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# Sections of the Clean Water Act

- **Title I Research and Related Programs**
  - Objective and Goals
- **Title II Grants for Construction of Treatment Works**
  - Funds to construct POTWs
- **Title III Standards and Enforcement**
  - Technology-based effluent limits
  - Water quality-based effluent limits
    - Designated uses
    - Criteria to attain and maintain uses
  - Pretreatment standards
  - Identify water bodies not meeting WQS and procedures for improvement
  - Penalties
- **Title IV Permits and Licenses**
  - **National Pollutant Discharge Elimination System (NPDES) program**
  - Ocean Discharge permits
  - Disposal of dredged or fill material permits
  - Sewage sludge management
- **Title V General Provisions**
  - States may have more stringent standards
  - Allows citizen suits to compel compliance
- **Title VI State Water Pollution Control Revolving Funds**

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# TITLE III
## Standards and Enforcement

- **301 – Discharge of pollutants unlawful unless it complies with this and other sections, technology-based standards, Priority Pollutant List.**
- **302 – Requires water quality based limits when technology-based standards fail to achieve or maintain the water quality of the water body, waivers based on social and economic value.**
- **303 – Identify waters that can not meet water quality even if TBEL are achieved, process to develop and apply WQBELs**
- **304 – Issue guidelines to identify and control nonpoint sources**
- **305 – Every 2 years, present nationwide inventory of point source discharges and water quality of all navigable waters**

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# TITLE III
## Standards and Enforcement

- **306 – Industrial sources, performance standards, new source performance standards**
- **307 – How to set and review effluent limits for Priority Pollutants, direct dischargers and indirect dischargers**
- **308 – Monitoring and recordkeeping**
- **309 – Federal enforcement mechanisms**
- **310 – International issues**
- **311 - National Contingency Plan**
- **312 – Marine sanitation devises**
- ***313 – Water pollution control at federal facilities (for example, military bases)***

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# TITLE III
## Standards and Enforcement

- 314 – Clean Lakes program
- 315 – Creates National Study Commission to investigate the technical, economic, and social aspects of meeting the requirements of Section 301.
- 316 – Thermal pollution in receiving waters
- 317 – Study alternatives to municipal construction grants program
- 318 – Aquaculture
- 319 – Nonpoint sources, inventory waters that do not meet the standards due to nonpoint sources, develop plan, award grants
- 320 – National Estuary Program

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# TITLE IV
# Permits and Licenses

- **401 – Dischargers must certify that they will comply with Title III**
- ***402 – National Pollution Discharge Elimination System Permits, State programs. Exemptions and waivers from permitting, anti-backsliding, permitting separate storm sewer discharges***
- **403 – Permits for ocean discharges**
- **404 – Special permit program to control dredge and fill operations by the Secretary of the Army, USEPA develops guidelines and determines suitable disposal sites**
- **405- Management of wastewater treatment sludge**

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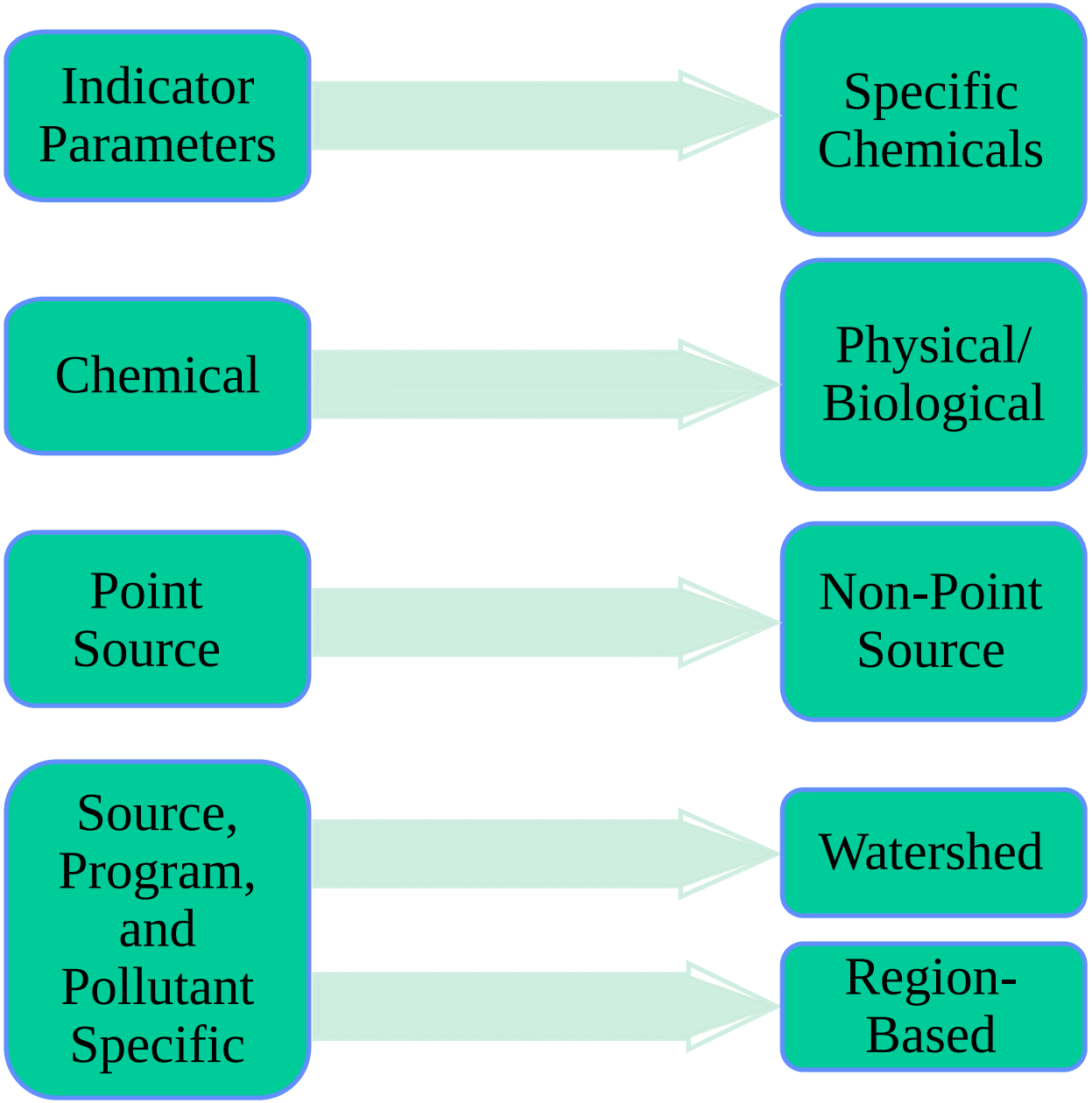
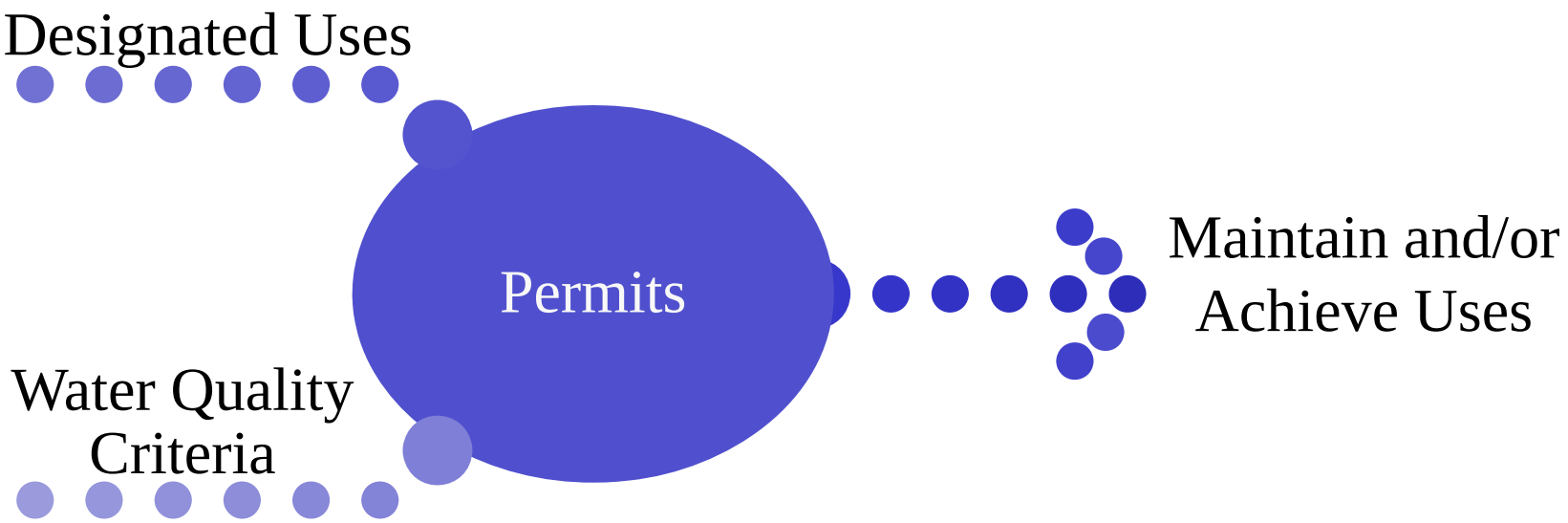
# Implementation of the Clean Water Act
# Trends Over Time



# Clean Water Act Process



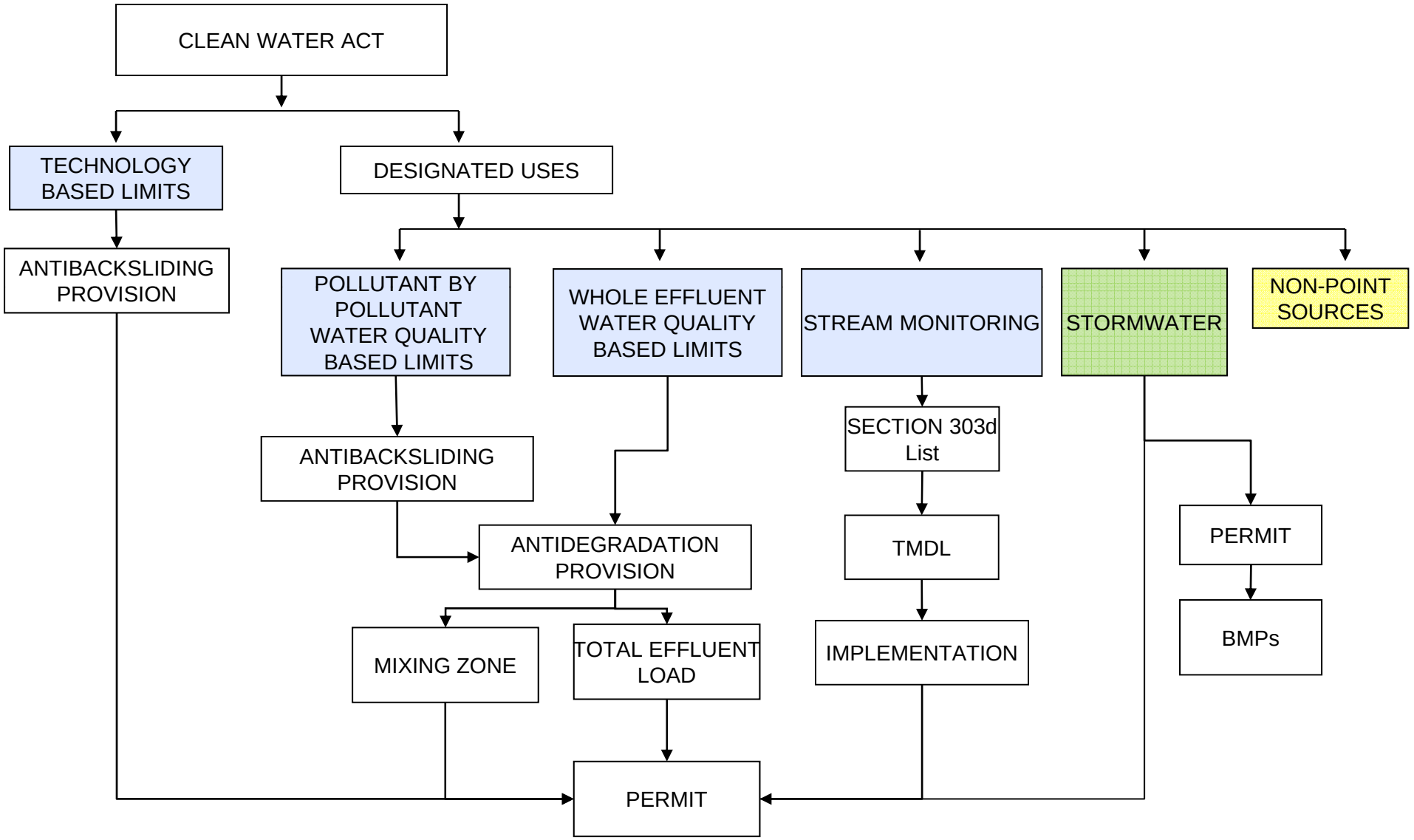
# In other words…

.t’s \ .

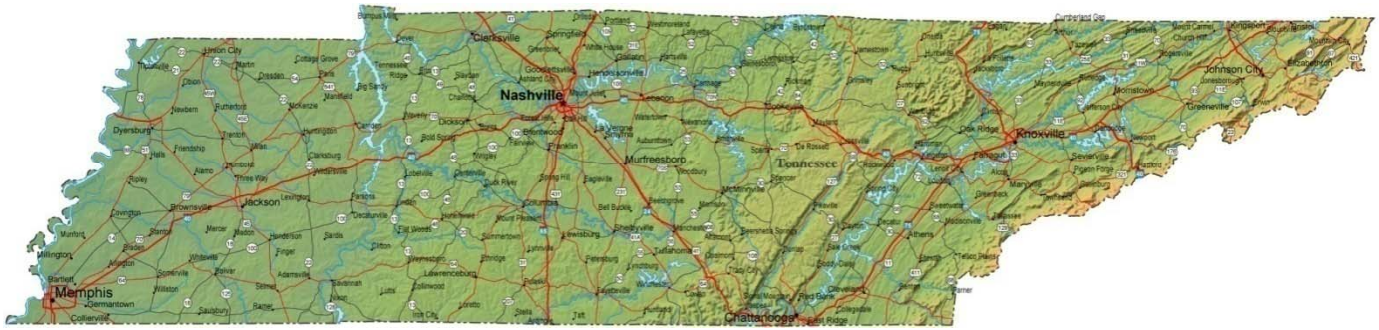
# What is in a Permit?

- Numeric limits
- Standard Conditions
- Special Conditions

# Overview of Clean Water Act Permitting



# Designated Water Uses in Tennessee




- Domestic Water Supply
- Industrial Water Supply
- Fish and Aquatic Life
- Recreation
- Irrigation
- Livestock Watering and Wildlife
- Navigation

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# Water Quality Criteria in Tennessee

- Set up for the different Designated Uses
- Found in 1200-4-3-.01

- For example:

**Domestic Water Supply**

| | |
|---|---|
| Dissolved Oxygen | Turbidity or color |
| pH | Temperature |
| Hardness | Coliform |
| Total Dissolved Solids | Taste or odor |

Solids, floating materials and deposits

Toxic substances

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# TDEC Reports

- **Exceptional Tennessee Waters (previously know as Tier 2) and Outstanding National Resource Waters (ORNW) (Tier 3)**
- **Year 2010 303(d) List – Proposed Final Version**
- **2010 305(b) Report – The Status of Water Quality in Tennessee**
- **Red River Watershed of the Cumberland River Basin, Watershed Water Quality Management Plan, 2007**

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# TDEC Reports

- **Exceptional Tennessee Waters (previously know as Tier 2) and Outstanding National Resource Waters (ORNW) (Tier 3)**

| Watershed Name | Waterbody | County | Description | Basis for Inclusion |
|---|---|---|---|---|
| Cumberland-Lower-Barkley Lake | Cooper Creek | Montgomery | Portion in Barnetts Woods SNA. | Barnetts Woods State Natural Area |
| Red | Passenger Creek | Montgomery | From Red River to origin. | Exceptional biological diversity. WPC ecoregion reference stream for 71e. |
| Red | Red River | Montgomery | Portion in Port Royal SHP. | Port Royal State Historic Park |
| Red | Swan (Dunbar) Lake | Montgomery | Within Dunbar Cave SNA. | Dunbar Cave SNA |
| Cumberland-Lower-Barkley Lake | Cumberland River | Montgomery | From Blooming Grove Creek (RM 112) to Hog Branch (RM 116.2) | State threatened Short-beaked Arrowhead. (State endangered Rock Goldenrod who's habit is limestone riverbanks also occurs). |
| Cumberland-Lower-Barkley Lake | Deason Creek | Montgomery | From Weaver Creek to origin. | State threatened Short-Beaked Arrowhead. |
| Cumberland-Lower-Barkley Lake | Hog Branch | Montgomery | From Cumberland River to O-Neal Road. | State threatened Short-Beaked Arrowhead. |
| Cumberland-Lower-Barkley Lake | Weaver Creek Unnamed Tributary | Montgomery | Unnamed tributary to Weaver Creek near Palmyra. | State threatened Short-Beaked Arrowhead. |
| Cumberland-Lower-Barkley Lake | Weaver Creek | Montgomery | From Cumberland River to origin. | State threatened Short-Beaked Arrowhead. |
| Red | Spring Creek | Montgomery | From unnamed tributary near Hampton Station to Kentucky State Line. | State endangered White Water-Buttercup. |

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# TDEC Reports (cont.)

- **Year 2010 303(d) list – proposed final version**
  - Impaired Waterbodies List
  - Need additional pollution controls
  - Additional loadings of the pollutants of concern are not allowed (limiting expansion and location)
  - Prioritizes impacted streams for TMDL studies

TDEC 303(d) List

# TDEC Reports (cont.)

- **2010 305(b) Report – The Status of Water Quality in Tennessee**
  - Describes the water quality assessment process
  - Categorize waters in the State
  - Identify waterbodies that pose eminent human-health risk due to elevated bacteria levels or contamination of fish
  - Describes projects and initiatives

TDEC 305(b) Report

# TDEC Reports (cont.)

- **Red River Watershed of the Cumberland River Basin, Watershed Water Quality Management Plan, 2007 (TDEC Watershed Website)**
  - Strategy for information collection and analysis
  - Common understanding of the roles, priorities, and responsibilities of all stakeholders within the watershed
  - Description of the watershed
  - Review of water quality sampling and assessment
  - Point and Nonpoint sources
  - Partnerships
  - Point and Nonpoint source approaches, TMDLs, and assessment of needs for the watershed

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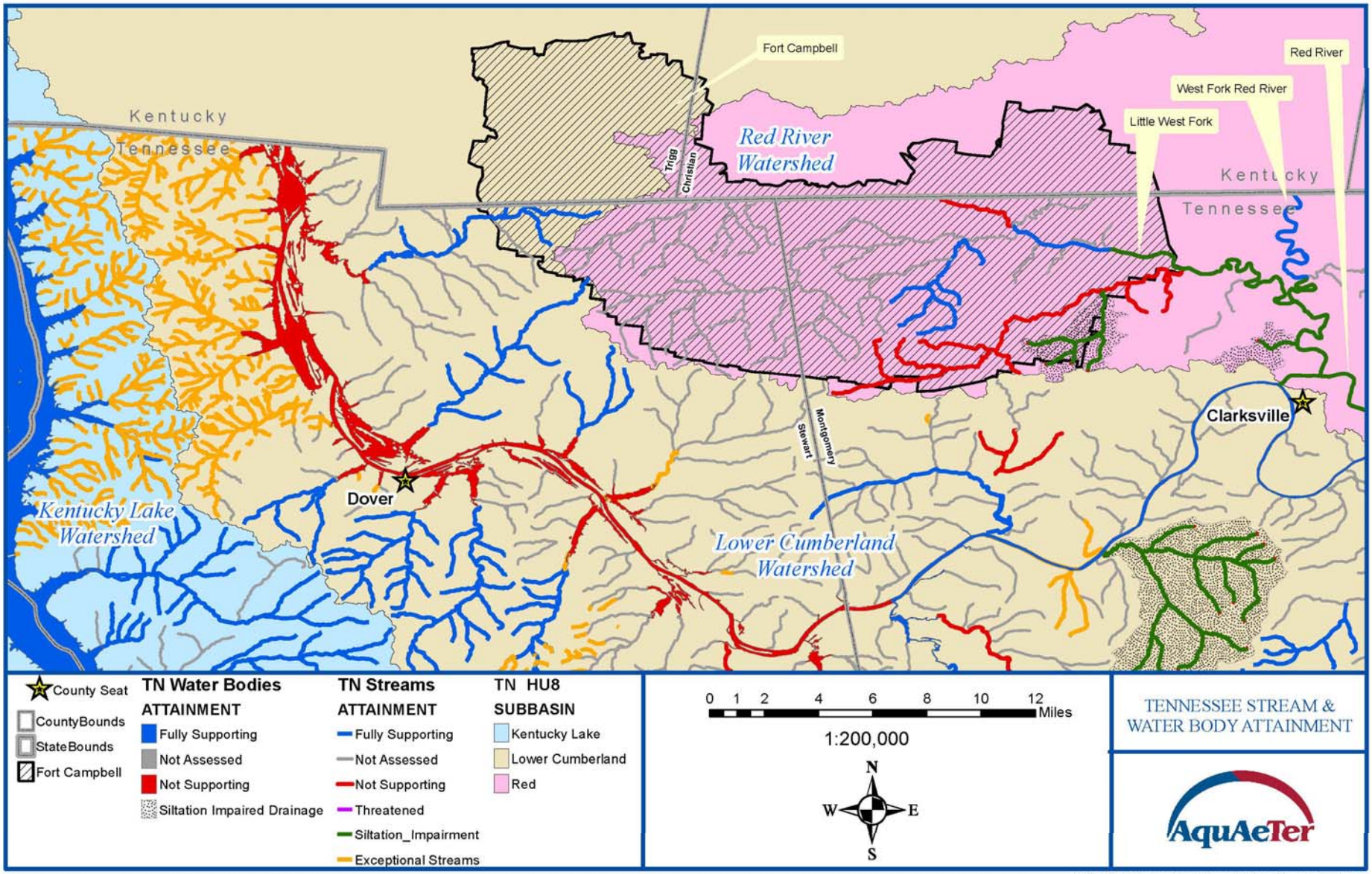


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# Noah's Spring Branch
# Water Quality

| Designated Use | Designated Use Group | Status |
|---|---|---|
| Fish And Aquatic Life | Fish, Shellfish, And Wildlife Protection And Propagation | Impaired * |
| Irrigation | Agricultural | Good |
| Livestock Watering And Wildlife | Agricultural | Good |
| Recreation | Recreation | Good |

* Impairment due to Habitat Alteration

# NPDES Permitting

- Wastewater Discharges
- Stormwater Discharges

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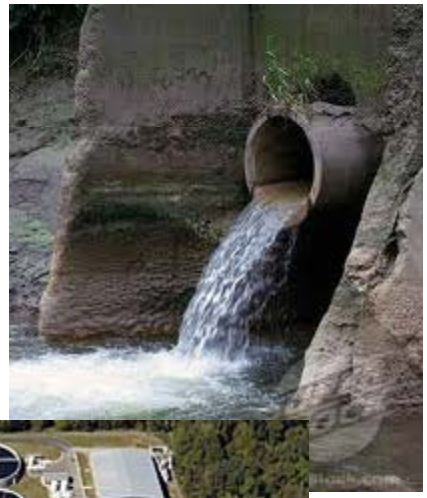
# NPDES Permitting for Wastewater Dischargers

- **Permit limits use the most protective of:**
  - Technology based effluent limits
  - Water quality based effluent limits
- **Permit limits take into account:**
  - Stream attainment
  - Background
  - Wasteload allocation



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# NPDES Permitting for Stormwater Dischargers

- MS4 (Municipal Separate Storm Sewer Systems)
- Construction
- Industrial

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# NPDES Stormwater Dischargers (cont.)

- **Stormwater permitting is, in general, based on Pollution Prevention**

# Construction Stormwater Discharges

- **USEPA conducted and review many studies on the impacts of construction activities on water quality**

FEDERAL REGISTER

- **December 8, 1999**

  **"Stormwater discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts."**

# Construction Stormwater Study Results

- **Water quality impacts listed by USEPA include:**
  - Introduction of pollutants to the aquatic environment on the sediment
    - Nutrients (primarily phosphorus)
    - Metals
  - Organic compounds
  - Habitat destruction
    - Physical damage to organisms
    - Blocking sunlight
    - Filling of riffles and pools

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# Construction Stormwater Study Results (cont.)

- **Additional water quality impacts listed by USEPA include:**
  - Filling lakes and reservoirs
  - Clogging stream channels
  - Reduce stream depth
  - Reduce habitat diversity by filling in pools
  - Alter stream biological diversity

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# Construction Stormwater Study Results (cont.)

- **Impact designated uses**
  - Public water supply
  - Recreation
  - Propagation of fish and wildlife

NASHVILLE CRAYFISH

NORTH AMERICAN PADDLEFISH

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# Flexibility Mechanisms

- **For Stormwater, site-specific pollution prevention plans, BMPs, and no exposure certifications**
- **Use Attainability Analysis**
- **Site Specific**
  - Site Specific Criteria
  - Mixing Zones
  - Total Maximum Daily Load/Wasteload Allocations/Assimilative Capacity
- **Variance**
- **NPDES Permit Compliance Schedule**

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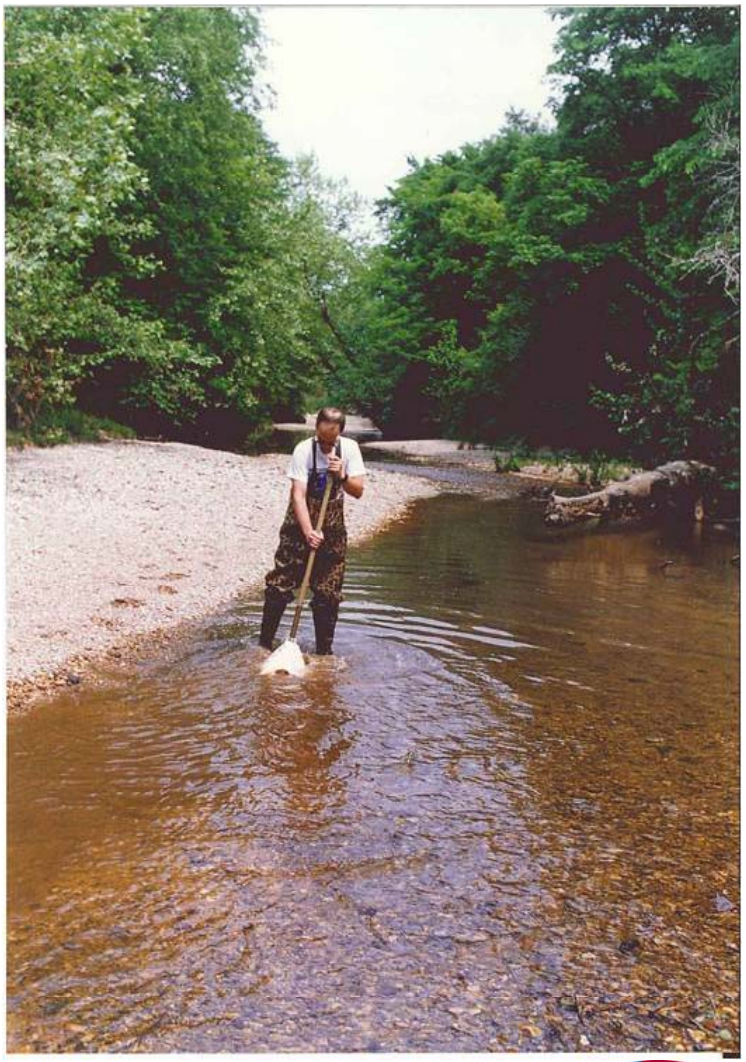
# Example 1 - Use Attainability Analysis

# Use Attainability Analysis (cont.)

# Use Attainability Analysis (cont.)

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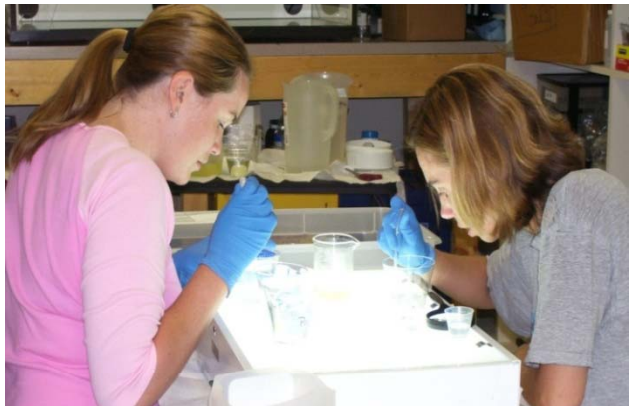
# Example 2 – Site-Specific WQC for Copper

United States Environmental Protection Agency | Office of Water 4304 | EPA-822-R-01-005 March 2001

EPA

**Streamlined Water-Effect Ratio Procedure for Discharges of Copper**



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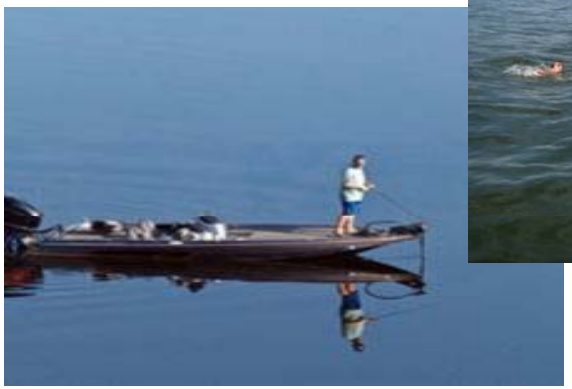
SHORT-BEAKED ARROWHEAD

# In Conclusion . . . .

# We care about the Clean Water Act – because its GOAL is:



# That's how did we got from

## HERE to HERE

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**Pamela A. Hoover, P.E.**
**(615) 373-8532**
**phoover@aquaeter.com**

**Christopher S. Green**
**(615) 373-8532**
**cgreen@aquaeter.com**


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