Water Quality Standards Implementation

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Water Quality Standards
Implementation: Permitting
Changes based on Revision

- Limit Derivation
- Other
Limit Derivation

- Metals and Hardness - Median
  - Actual hardness, or
  - Ecoregion hardness
  - Cd (chronic) and Pb (chronic)

- Total Residual Chlorine
  - 11 µg/L - Chronic

- Cyanide
  - 5.2 µg/L - Chronic
Limit Derivation

• Chlorides and Sulfates
• pH
  – 4-day average
  – Cannot exceed Technology-based Effluent Limits, 10 CSR 20-7.015
• Reasonable Potential Analysis
Other

- Water Quality Standards, 25% - addition
- Anti-backsliding
- **New** Numeric Lake Nutrient Criteria
Water Quality Standards Implementation: Evaluation of Environmental and Economic Impacts
As part of the implementation of any revised water quality standards modifications of twenty-five percent or more, the department shall conduct an evaluation which shall include the environmental and economic impacts of the revised water quality standards and criteria on a subbasin basis. This evaluation shall be conducted at the eight-digit hydrologic unit code level. The department shall document these evaluations and use them in making individual site-specific permit decisions.
Water Quality Standards Implementation: Lake Nutrient Criteria Implementation Plan
Part I: Monitoring and Assessment

• Monitoring Efforts
  – Lakes of Missouri Volunteer Program
  – Statewide Lake Assessment Program
Part I: Monitoring and Assessment

Data Requirements for Assessment

• At least four samples collected between May 1 and September 30 under representative conditions;
• Each sample must have been analyzed for at least Chl-a, TN, TP, and Secchi depth;
• At least three years of samples (years do not have to be consecutive). Data older than seven years will not be considered, consistent with the Department’s Listing Methodology (see Appendix B);
• Data collected under a Quality Assurance Project Plan (QAPP).
## Criteria for Assessment

<table>
<thead>
<tr>
<th>Lake Ecoregion</th>
<th>Chl-a Response Impairment Thresholds (µg/L)</th>
<th>Nutrient Screening Thresholds (µg/L)</th>
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<tr>
<td>Plains</td>
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Assessment Methodology

- Lake Numeric Nutrient Criteria
- Lake Response Assessment Endpoints

The five response assessment endpoints are:

1. Occurrence of eutrophication-related mortality or morbidity events for fish and other aquatic organisms
2. Epilimnetic excursions from dissolved oxygen or pH criteria
3. Cyanobacteria counts in excess of 100,000 cells/mL
4. Observed shifts in aquatic diversity attributed to eutrophication
5. Excessive levels of mineral turbidity that consistently limit algal productivity during the period of May 1 – September 30
Part I: Monitoring and Assessment

• Trend Analysis
Part I: Monitoring and Assessment

• Total Maximum Daily Load Development for Nutrient Impaired Waters
Part II: Permit Implementation

Three-Phase Approach:

1. Data Collection and Analysis
2. Voluntary Plant Optimization and Source Controls
3. Final Effluent Limits
Part II: Permit Implementation

Three-Phase Approach – Which Permits?

• Dischargers to lake watersheds
  – Lake is not impaired
  – Lake is greater than 10 acres
  – Lake is not in “Big River Floodplain” ecoregion

• Facility has a design flow > 100,000 gpd

• Facility that “typically” discharges nutrients
  [10 CSR 20-7.015]
Phase 1: Data Collection and Analysis

• Influent and effluent monitoring for:
  – Total phosphorus
  – Total nitrogen
  – Nitrate plus nitrite
  – Ammonia

• Frequency:

<table>
<thead>
<tr>
<th>Design flow in GPD</th>
<th>Sampling frequency</th>
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</thead>
<tbody>
<tr>
<td>100,001-1,000,000</td>
<td>Quarterly</td>
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<tr>
<td>1,000,001 and greater</td>
<td>Monthly</td>
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</table>
Phase 2: Voluntary Plant Optimization and Source Controls

• Voluntary – If permittee opts out, Phase 3. Phase 1 data will be used to determine reasonable potential.

• Permit will include a special condition to develop and implement a Plant Optimization Plan and a Phosphorus Minimization Plan.

• Resources (training, fact sheets, templates) will be made available to permittees for these efforts.
Phase 3: Final Effluent Limits

• During Phase 1 and 2, Department staff will be setting up models for lake watersheds. This effort will be prioritized based on permit synchronization.

• If watershed modeling shows there is reasonable potential, total phosphorus effluent limits will be established in the permit (unless modeling shows nitrogen is the limiting pollutant).

• If needed, flexibilities such as compliance schedules, integrated planning, variances, etc. may be implemented at this point.
Dischargers to Impaired Lakes

- Watershed modeling
- Not contributing to the impairment:
  - Limits are not needed
  - Possible monitoring
- Contributing to the impairment:
  - Total Phosphorus limits
New and Expanding Sources

Scenario 1: Requests discharge to a watershed with impaired lake:

- Watershed modeling to determine if the new/expanding source will contribute to the impairment
  - Yes = more advanced treatment is needed or an alternative method of wastewater disposal.
  - No = total phosphorus effluent limits
New and Expanding Sources

Scenario 2: Requests discharge to a watershed with a lake that is not impaired:

- Tier 2 antidegradation review
- Total phosphorus effluent limits based on technology
Incentives for Early Nutrient Reduction

Water quality may benefit from *early* nutrient reductions through:

- WWTF Optimization
- Pilot Testing
- Stress Testing
- New Technology Trials
Incentives for Early Nutrient Reduction (continued)

• Voluntary participation will be incentivized through regulatory flexibilities such as extended schedules of compliance.

• Permittees may accrue credits for watershed-based trading.
  – If TMDLs are developed, baselines for WWTFs will be established based on data/information in the absence of early actions.
Water Quality Standards Implementation: Variances
WQS Variances

1. Missouri Multiple Discharger Variance Framework from the Water Quality Standards of Total Ammonia Nitrogen, CWC-MDV-1-17

2. City of Kirksville Variance CWC-V-1-17

Variances will be incorporated into permits once EPA approval is received.
Geospatial Layer

- Owner Name
- Facility ID
- Facility Name
- Permit Number
- Permit Effective Date
- Permitted Feature ID
- Permitted Feature Effective Date
- Receiving Stream Name
- First Classified Water Body ID
- HUC8
- Discharge Location
- Variance ID
- Variance Type
- Variance Factor
- Management Plan Indicator
- Highest Attainable Conditions
- CWC Approval Date
- Variance Evaluation Date
- Variance Expiration Date
QUESTIONS?