Drinking Water Regulations

- Federal level
- State level
- Related laws and regulations
Federal Safe Drinking Water Act

- United States Environmental Protection Agency is the federal agency responsible for protecting the United States’ drinking water
  - Since 1990, EPA has passed 19 drinking water regulations
  - Currently regulates 90 contaminants
  - Requires compliance with contaminant levels, monitoring, reporting and notification
Federal Safe Drinking Water Act--Goal

• Primary goal of the Safe Drinking Water Act is to protect human health by regulating the treatment and distribution of drinking water
  – Compliance with maximum limits for contaminants
  – Monitoring and reporting requirements
  – Public notification and awareness requirements
  – Technical/managerial/financial aspects
  – Operator certification
Federal Safe Drinking Water Act

- Every 6 years the EPA reviews the existing regulations to see if changes are needed
  - Example: Revised Total Coliform Rule will replace the original 1989 Rule

- EPA maintains the “Contaminant Candidate List” (CCL) of potential drinking water contaminants

- EPA also directly administers “Unregulated Contaminant Monitoring Rules” to determine the extent of selected contaminants
  - Water systems have monitored for UCMR 1 and 2
  - UCMR 3 is pending
Kentucky Drinking Water Regulations

- Kentucky’s Division of Water administers and enforces the Safe Drinking Water Act
  - EPA develops a new drinking water regulation
  - KY then adopts the federal regulation
    - The KY regulation must be presented at a public meeting and must be approved by 2 legislative committees
  - EPA approves KY’s regulation and program (this is known as “primacy”)
Kentucky Drinking Water Regulations

• KY has Statutes (laws) that give the state the authority to regulate drinking water systems
  – KRS 151, 223 and 224

• Regulations are then developed to implement these laws
  – 401 KAR Chapter 8: Public Water Supply
  – 401 KAR Chapter 11: Operator Certification
Drinking Water Compliance Terms

- **Turbidity:** Clarity of the water
- **MOR:** Monthly Operating Report that includes turbidity and disinfection information
- **“Bacts”** Coliform samples
- **Chlorine residual:** Amount of chlorine detected in the plant or distribution system to control disease-causing organisms
- **“Chems”** Chemical contaminants
Drinking Water Compliance Terms

• DBPs: Disinfection by-products (primarily THMs and HAAs) formed when chlorine reacts with organic matter
• THMs: Trihalomethanes
• HAAs: Haloacetic acids
• PN: Public notification
• NOV: Notice of violation
• LOW: Letter of warning
• M&R: Monitoring and Reporting
## Drinking Water Compliance Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR:</td>
<td>Consumer Confidence Report</td>
</tr>
<tr>
<td>BWA:</td>
<td>Boil Water Advisory (issued for potential or confirmed microbiological contamination)</td>
</tr>
<tr>
<td>Sanitary Survey:</td>
<td>Comprehensive inspection of the entire water system covering 8 areas</td>
</tr>
</tbody>
</table>
| Capacity:  | 1. Approved rated flow  
2. Technical, managerial and financial ability to meet the SDWA |
| AWOP       | Area-Wide Optimization Program |
Drinking Water Compliance Terms

- **Infrastructure:** The tangible “concrete and steel” parts of the system

- **Sustainable Infrastructure:** Maintaining/improving drinking water “concrete and steel”
Defining a Water System

- **Public Water System**
  - Over 15 connections or over 25 people served

- **Community Water System**
  - Over 15 connections or over 25 people served for at least 6 months a year

- **Non-community Water System**
  - Non-transient: same people for 6 months
  - Transient: variable population

- **Semi-public Water System**
  - Less than 15 connections or less than 25 people served

- **Bottled Water System**
Water System “Capacity”

• A public water system should demonstrate “capacity” to meet the SDWA requirements
  – Technical
  – Managerial
  – Financial

• TMF capacity is inter-related
  – Without finances a plant cannot operate
  – Without sound management, finances cannot be obtained and system operation cannot be maintained
  – Without technical ability, safe water cannot be provided to expand the system to provide additional customers and income
Water System “Capacity”

• Capacity Development Assessment
  – Key components needed to successfully obtain and maintain TMF capacity
  – This assessment is incorporated into the Sanitary Survey process

• Managerial and financial areas are difficult to measure but critical to water system operation
  – Planning (asset management, contingency)
  – Decision making
  – Organizational structure
  – Budgets (operational, capital, short/long term)
  – Rates
  – Water loss
Source Water Quality and Quantity

- Raw source water must meet “Drinking Water Standards” set by KY regulations
  - These are set at the finished drinking water limits established by the Safe Drinking Water Act
  - Raw water quality also regulated by the Clean Water Act through “designated uses”
    - In KY the classification is “Domestic Water Supply”

- 263 Water Treatment Plants (55.4% of the public water systems)
  - 163 surface water treatment plants
  - 106 groundwater treatment plants
Source Water Quality and Quantity

- **401 KAR 4:010 “Water Withdrawal”**
  - Any withdrawal from rivers, impoundments or wells above 10,000 gallons per day must have a withdrawal permit

- **Source water and Wellhead Protection Plans**
  - Identify contaminants in the area around the source and solutions to controlling those contaminants.

- **Water Shortage Plans**
  - Tend to focus on droughts
  - Should be expanded to all types of water shortages (power outages, tank failures, plant upsets, pandemics, etc)
Drinking Water Regulations

• Over 19 different drinking water “rules” in 401 KAR Chapter 8:
  – Coliforms (bacteriological)
  – Inorganics
  – Lead and copper
  – Volatile organics
  – Synthetic organics
  – Radionuclides
  – Turbidity (surface water treatment)
  – Disinfection by-products
  – Disinfection residuals
  – Cryptosporidium, Giardia & viruses
  – Reports and notifications
Drinking Water Regulations

• There are 90 regulated contaminants
  – 6 microbiological
  – 1 turbidity
  – 3 disinfectants
  – 4 disinfectant by-products
  – 1 disinfection by-product precursor
  – 16 inorganics (metals and nutrients)
  – 53 volatile and synthetic organics
  – 4 radiological
  – 2 lead and copper
KY Drinking Water Reports and Data

• All drinking water data must be analyzed in labs certified by KY or EPA
  – The KY Division of Water audits and certifies all in-state drinking water labs
    • In KY there are
      – 44 certified microbiological laboratories and
      – 18 certified chemistry laboratories
    • There are 44 certified chemistry and radiological labs located in other states
  – 2 full-time staff are involved with lab certification
    • Microbiological, chemical, Crypto and radiological
Drinking Water Compliance

• Compliance is based on
  – Maximum contaminant levels (MCL)
    • Most contaminants
  – Treatment techniques (TT)
    • Difficult-to-measure contaminants that are easily controlled by treatment (turbidity, Crypto, Giardia, viruses)
  – Action levels (AL)
    • For lead and copper
Finished Drinking Water Quality

• Monitoring and Reporting
  – Monitoring can occur as frequently as every 4 hours or as long as every 3 years
    • Acute contaminants are monitored more frequently such as microbiological and turbidity
    • Chronic contaminants or those not often detected are monitored less frequently such as organic contaminants and radiologicals
  – Monitoring occurs in the water treatment plant and in the distribution system
  – Compliance data reports are submitted at least on a monthly basis
KY Drinking Water Reports and Data

• Data is reported in different ways
  – Milligrams per liter (mg/L) is the same as parts per million (ppm)
    • 1 in a million (1,000,000)
  – Sometimes it is reported in micrograms per liter (ug/L)
    • 1 in a billion (1,000,000,000)
  – Other units such as
    • NTU = Nephlometric Turbidity Units
    • SU = Standard Units (pH)
    • piCu/L = Picocuries per liter (radionuclide)
• State developed report forms for all contaminants
KY Drinking Water Reports and Data

• KY has 475 public water systems
  – Over 6000 microbiological results are submitted to the Division of Water each month
  – Approximately 20,000 turbidity results are submitted each month
  – 475 Monthly Operating Reports that vary from 4 to 20 pages in length are received each month
  – On an annual basis, over 1 million analytical results are submitted for compliance

• 7 staff are involved with compliance data
Drinking Water Technical Assistance

• Compliance with the SDWA regulations is challenging—period
  – DOW has 6 staff state-wide that provide technical assistance to help systems stay in compliance
    • One-on-one assistance to systems
    • Small group training
    • Presentations to large audiences
  – Coordinate the nationally-recognized Area-Wide Optimization Program (AWOP) that encourages systems to improve treatment to produce even safer water
Drinking Water Evaluations

• SDWA now requires all water systems to undergo a “sanitary survey” every 3 years that covers 8 areas from source water to management to recordkeeping to treatment to distribution
  – Jointly conducted by DOW Capacity Development section and the Compliance/Technical Assistance Branch (primarily the Regional Office staff)
  – Approximately 120-130 per year

• Also the DOW Regional Offices conduct inspections annually for all water systems not scheduled for a sanitary survey
  – Not as comprehensive as a sanitary survey
KY Drinking Water Reports and Data

- SDWIS = Safe Drinking Water Information System
  - State database for tracking and running compliance
  - Now at version 3.0
  - Compatible with Federal database
  - KY developed data entry files to help with entering the data into SDWIS

- SDWIS will no longer be supported by EPA in several years
  - Moving through EPA Region-type support then to a “cloud” environment
Drinking Water Watch

- Public access to SDWIS
  - http://dep.gateway.ky.gov/DWW
DW Enforcement Response Policy (ERP)

• New EPA initiative to track chronic non-compliance
• Replaces the old Significant Non-compliance (SNC) list
• Combination of points assigned to acute and chronic violations as well as monitoring and reporting violations
  – Certain score requires “formal” enforcement
  – In KY this means an Agreed Order
Consumer Notification

• The public must be notified of
  – Safe Drinking Water Act violations
  – Potential health issues such as lead

• Through the Consumer Confidence Report (CCR), water system customers receive an annual report that provides information on the water system, including violations, detected contaminants and health effects

• Other notices include Boil Water Advisories
Operator Staffing and Certification

• Water treatment plants and distribution systems must be staffed by properly certified personnel in direct responsible charge (401 KAR 8:030)
  – Plant classification and staffing based on source water and rated design capacity
    • Surface waters require the most attention due to its variability and each shift must be staffed
  – Distribution is based on population served

• Alternate staffing plans
Operator Staffing and Certification

- Division of Compliance Assistance
  - 401 KAR Chapter 11
- Combination of education and experience
- Operator-in-training concept
- Certified operators must obtain Continuing Education Units (CEUs) to maintain a license
  - Every 2 years
  - Amount of CEUs required based on classification level
- Ethics language in regulation
Engineering Plans Review

- States must have a process for assuring water treatment plants and distribution systems are designed per current engineering standards
  - 401 KAR 8:100
  - Kentucky Design Criteria
  - 10 States Standards

- Overlap with Department for Public Health and Division of Plumbing on determining “potable” water needs
  - Food establishments
  - Restrooms with sinks
Related Drinking Water Regulations

• Any discharges back to receiving streams or lakes (Clean Water Act permit)
  – Water treatment plant discharges (KPDES KYG64)

• Construction in a floodplain, dredging a stream or impacting water quality standards
  – 401 and 404 permits (Corps of Engineers and DOW)

• Disposal of any solid material removed during treatment (such as filtration)
  – Special Waste disposal permit (Division of Waste Management)
Related Drinking Water Regulations

- Air quality (Clean Air Act)
  - Potential chlorine gas releases

- Occupational health and safety of workers (OSHA)
  - Includes chlorine gas safety, confined space entry, lockout/tag out, Process Safety Management, respiratory protection

- Emergency preparedness
Questions?? Comments??

Julie W. Roney
Drinking Water Coordinator
KY Division of Water
Julie.Roney@ky.gov
502/564-3410
Web: water.ky.gov