

Kentucky Drinking Water Program Water System Standards and Development

Presentation to the Georgian National Energy
and Water Supply Regulatory Commission

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KY Drinking Water Regulatory Structure

KY Public Service Commission

- Regulates non-municipal utilities only
- Service and rates
- Management/finances
- Customer-driven

Energy and Environment Cabinet
(Dr. Len Peters, Secretary)

KY Public Service
Commission
(David L. Armstrong, Chairman)

KY Drinking Water Regulatory Structure

KY Division of Water

- Regulates ALL drinking water systems
- Source water
- Treated drinking water
- Waste discharges
- Water quality and quantity

Energy and Environment Cabinet
(Dr. Len Peters, Secretary)

Department for
Environmental
Protection
(Bruce Scott,
Commissioner)

Division of Water
(Sandy Gruzesky, Director)
232 staff

National and State Relationship



Drinking Water Regulations

- National Level: Environmental Protection Agency's Safe Drinking Water Act (SDWA)
- KY Level at the Division of Water: 401 KAR Chapter 8 "Public Water Supply"
- States are granted "primary enforcement" by EPA to enact the requirements of the SDWA
- Water quality, water quantity, engineering, funding, management, system staffing

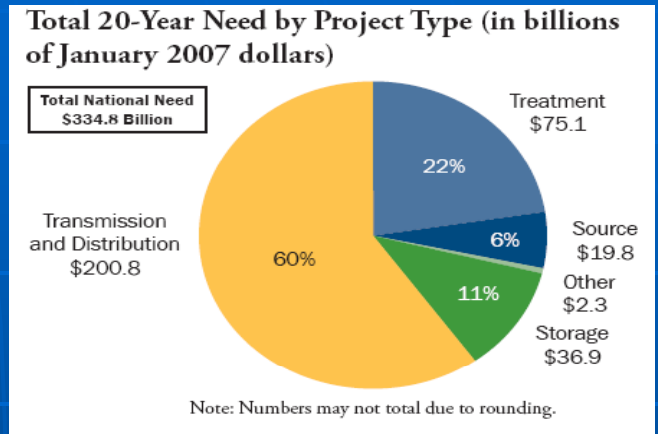
Water System Planning

Planning for Projects

➤ EPA Needs Survey

❖ \$334.8B for DW infrastructure need in the US (2007 Needs Survey)

- Drinking Water State Revolving Loan Fund—Intended Use Plan (to identify and rank projects)
- State Water Management Councils
- 20 Year Infrastructure Plans
- Line extension and tap sanctions



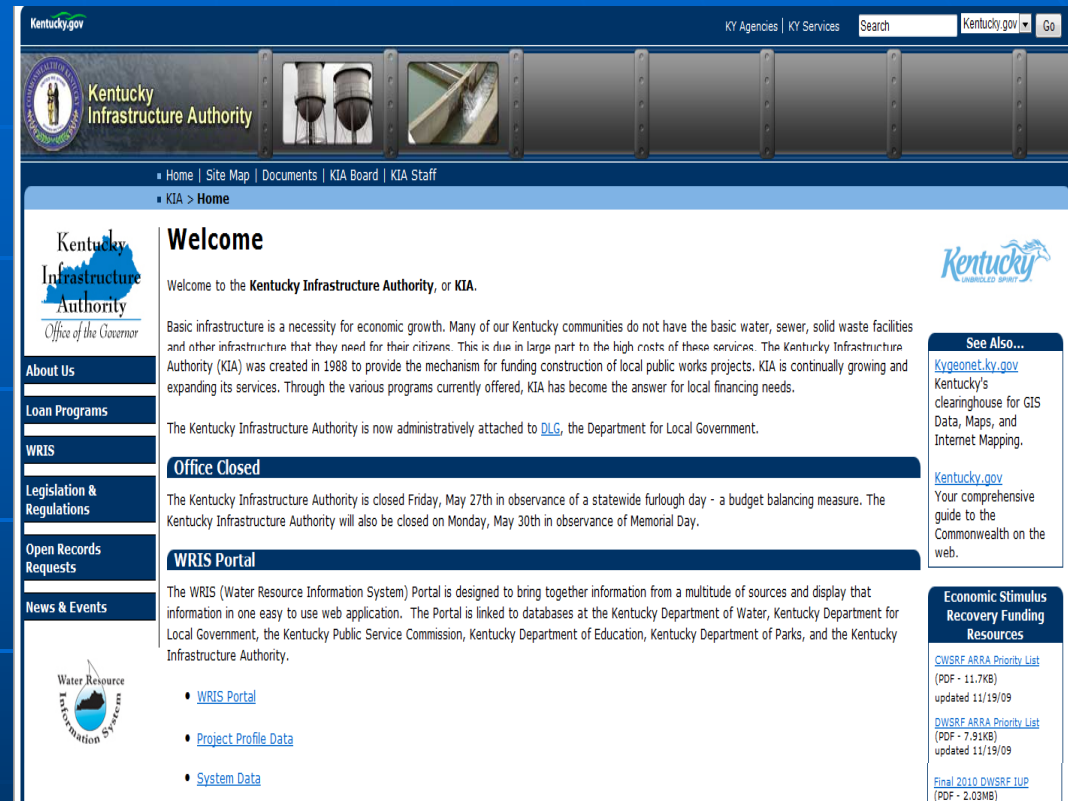
Challenge: Water systems wait until something breaks before planning for repair or replacement

Water System Funding--National

- Grant (free) money is preferred but not as available as in the past
- Low-interest loans
- National level
 - ❖ State Revolving Loan Funds and Special Appropriations through EPA
 - ❖ Rural Development and Community Development grants and loans
 - ❖ Congressional appropriations

Water System Funding--Kentucky

- Kentucky legislature can allocate money for projects
- Kentucky Infrastructure Authority (KIA) functions as the “bank” for distributing both national and state funds
 - ❖ Planning is used to choose projects
- Private financing through local bonds and loans
- 278 KRS.023

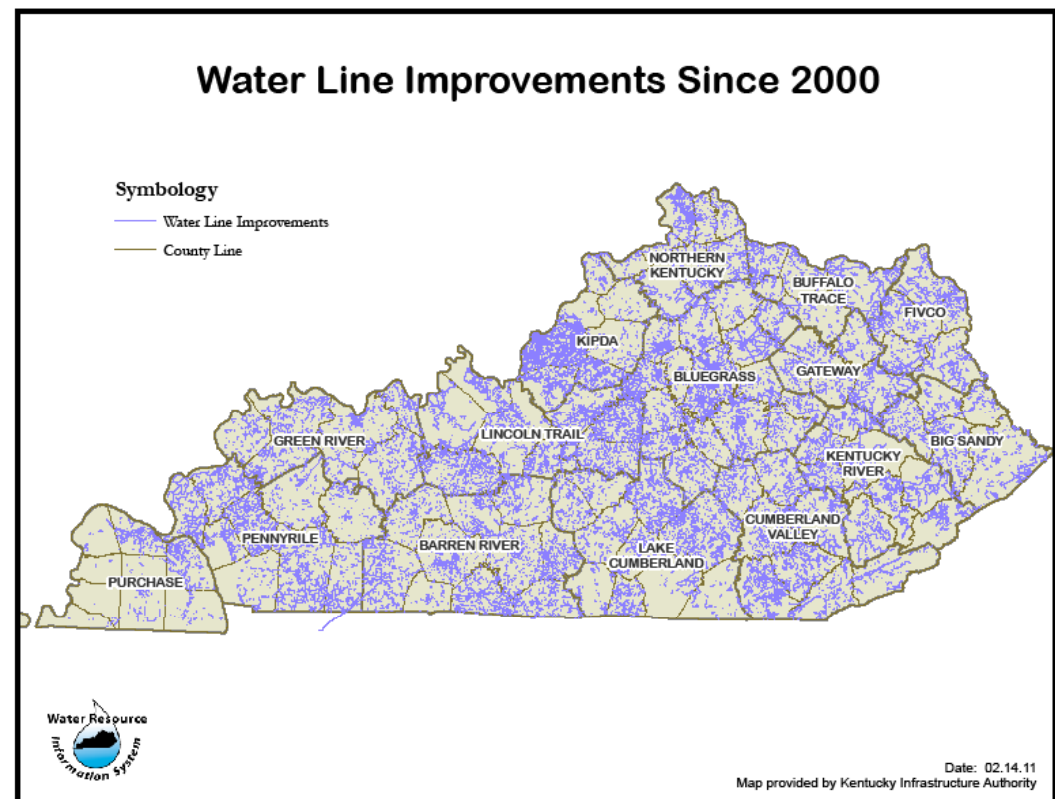


Drinking Water Infrastructure	Wastewater Infrastructure
2011 water lines = 56,885 linear miles. Δ 2009 - 2011: +1613 miles for a 2.8% increase	2011 sewer lines = 12,917 linear miles. Δ 2009 - 2011: +417 miles for a 3.3% increase
2009 water lines = 55,272 linear miles. Δ 2005 - 2009: +6016 miles for a 12.2% increase	2009 sewer lines = 12,500 linear miles. Δ 2005 - 2009: +1652 miles for a 15.2% increase
2005 water lines = 49,256 linear miles. Δ 2003 - 2005: +26,504 miles for a 116% increase	2005 sewer lines = 10,848 linear miles. Δ 2003 - 2005: +4,566 miles for a 73% increase
2003 water lines = 22,752 linear miles	2003 sewer lines = 6,282 linear miles
Δ 2003 - 2011: +34,133 miles for a 150% increase	Δ 2003 - 2011: +6635 miles for a 105% increase

House Bill 409

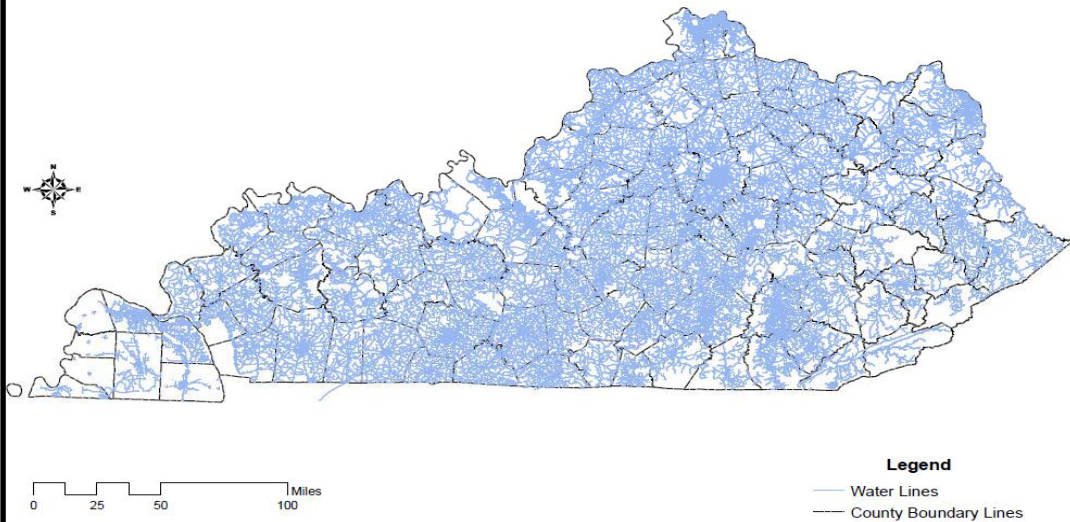
- Known as the “2020 Plan”
- Funding and water infrastructure

Drinking Water Infrastructure Improvements 2000-2010



Drinking Water Lines

56,885 miles

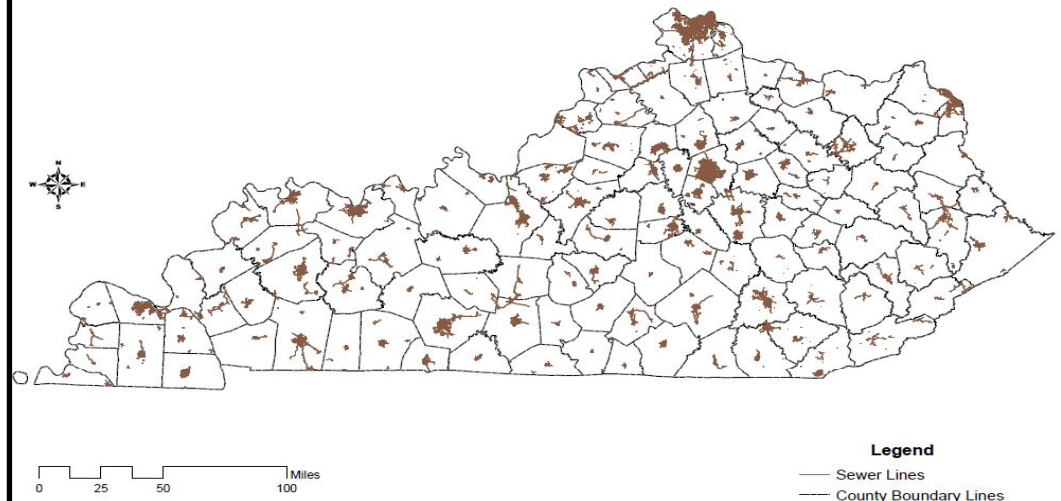


Map prepared July 2011 by Julie Smoak utilizing data from the EEC GIS Portal

2010 Drinking Water Infrastructure compared to Wastewater Infrastructure

Wastewater Lines

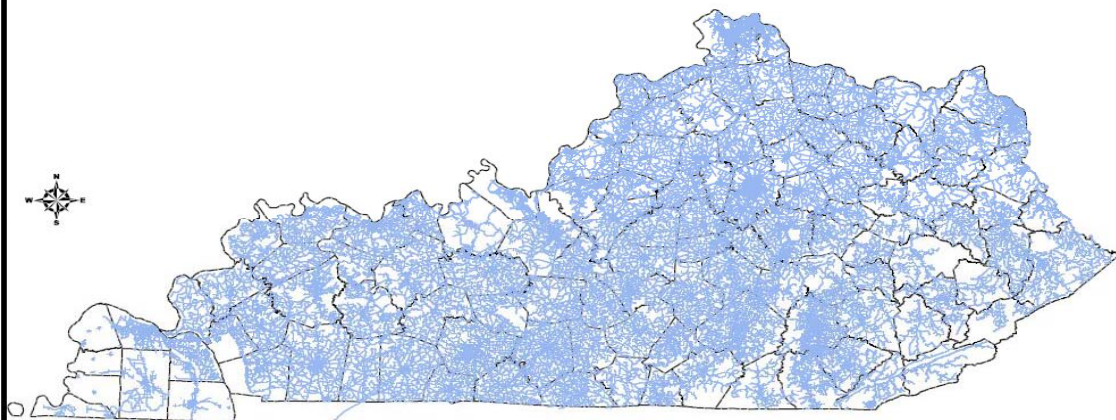
12917 miles



Map prepared July 2011 by Julie Smoak utilizing data from the EEC GIS Portal

Drinking Water Lines

56,885 miles



0 25 50 100 Miles

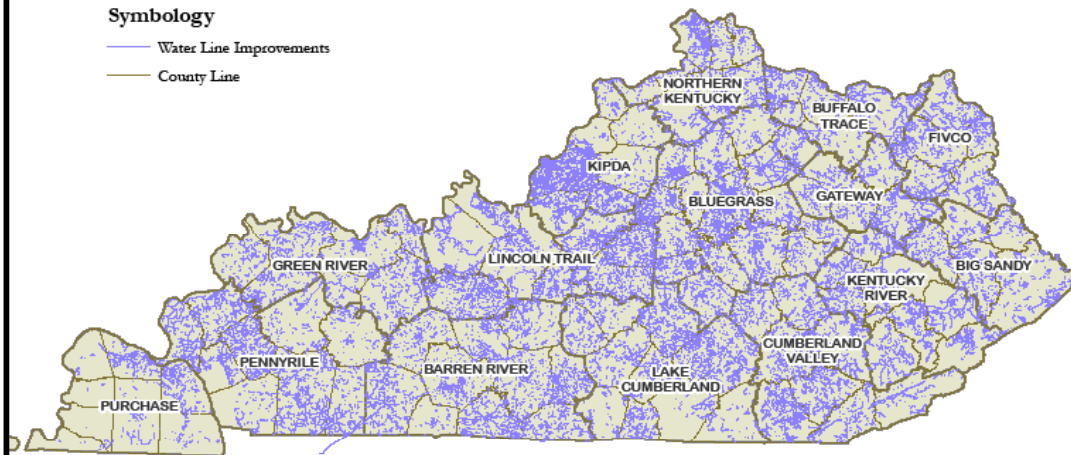
Map prepared July 2011 by Julie Sn

Comparing 2011 total
water line coverage to the
improvements since 2000

Water Line Improvements Since 2000

Symbology

- Water Line Improvements
- County Line



Date: 02.14.11
Map provided by Kentucky Infrastructure Authority

Water System Development

- Engineering and funding should occur together but funding often happens last
- KY Division of Water approves
 - ❖ All engineering and design changes or additions to drinking water systems (plant, distribution)
 - ❖ New raw water sources
 - ❖ Treatment chemicals

Water System Line Extension Process

- Application includes hydraulic analysis, plans and specifications, maps (can be electronic submittals)
- Hydraulic models can use modeling software or 2 point flow tests
- Must demonstrate available pressure during peak demand
 - ❖ Greater than 30 psi at customer meter
 - ❖ Never less than 20 psi in the water lines
 - ❖ During flushing velocities

Water System Line Extension Process—Water Mains

Engineering requirements

- Minimum 3 inch line size
- Enough cover to prevent freezing
- Required horizontal and vertical distances between drinking water and sewer lines
- Stream crossing and floodplain requirements
- Dead end lines must show 3 day turnover
- Appropriate valving
- Disinfection of line before placing in service

Water System Line Extension Process—Tanks and Booster Stations

Tanks

- Demonstrate 3 day turnover
- Screened vents
- Separate inlet and outlet piping
- Overflow piping extended from base of tank and covered
- Check valves
- Disinfection prior to use
- PSC requires 1 day of storage based on average production at the water treatment plant

Water System Line Extension Process—Tanks and Booster Stations

Booster Stations

- Typically for pressure but can also be for disinfection
- If for pressure, minimum of 2 pumps capable of meeting peak pressure demand with 1 pump out of service
- If hydro-pneumatic station, design is based on 10 times the average customer demand
- Appropriate valves and gages
- If for disinfection, must meet design criteria for type of disinfection used (gas or liquid)
- Back-up power generation recommended (not required)

Drinking Water Quality Standards

KY Division of Water regulates source water and treated drinking water

- Source water (both surface and ground)
 - ❖ Must meet Domestic Water Supply Criteria or can't use the source
 - ❖ Wastewater "5 Mile Policy"
 - ❖ Source water withdrawal requirements
- Treated drinking water must meet requirements of the SDWA and of 401 KAR Chapter 8 "Public Water Supply"

KY Drinking Water Systems

Statistics

- As of June 20, 2011: 463 Public Water Systems
 - ❖ 322 have surface water sources
 - ❖ 141 have groundwater sources
- 265 have water treatment plants
- 198 purchase water from another system and distributes it (no treatment)
- PSC regulates 148 of the 463 systems

Drinking Water Quality Standards

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

Drinking Water Quality Standards

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 radionuclides
- Monitoring occurs in the water treatment plant and in the distribution system
- Compliance data reports are submitted at least on a monthly basis (over 21,000 paper forms a year)

Drinking Water Quality Standards

Inspections

- KY DOW inspects all drinking water systems annually
- Every 3 years, the DOW conducts a Sanitary Survey
 - ❖ More comprehensive than a routine inspection
 - ❖ Covers 8 critical components of a water system
 - ❖ Must include technical, managerial and financial
- Deficiency letters and inspection/survey forms are sent to the water system
 - ❖ By a date noted in the letter, the water systems are to correct deficiencies or have a plan to correct them
 - ❖ Failure to correct can result in a notice of violation

Drinking Water Quality Standards

Violations and Enforcement

- Compliance-related drinking water violations require Public Notification to the consumers
- Unresolved violations result in referring the water system to the Division of Enforcement for formal enforcement actions
 - ❖ Bilateral Agreed Orders and Corrective Action Plans
 - ❖ Fines
 - ❖ Court action

Drinking Water Quality Standards

Additional Drinking Water Programs

- Laboratory certification
- Water treatment and distribution operator certification
- Technical and compliance assistance
- Managerial and financial assistance
- Wellhead and Groundwater Protection Plans
- Treatment plant discharges to waters of the state

Line Loss

Water Loss/Unaccounted for Water

- KY PSC does not allow greater than 15% water loss to be captured in a rate increase
- KY DOW currently does not have water loss regulations but may develop them in the near future
- PSC and DOW continue to have discussions on a common approach to water loss
- DOW considers water loss when a water treatment expansion project is reviewed
- Uncontrolled water loss can also cause a system to remain under a line extension or service tap ban

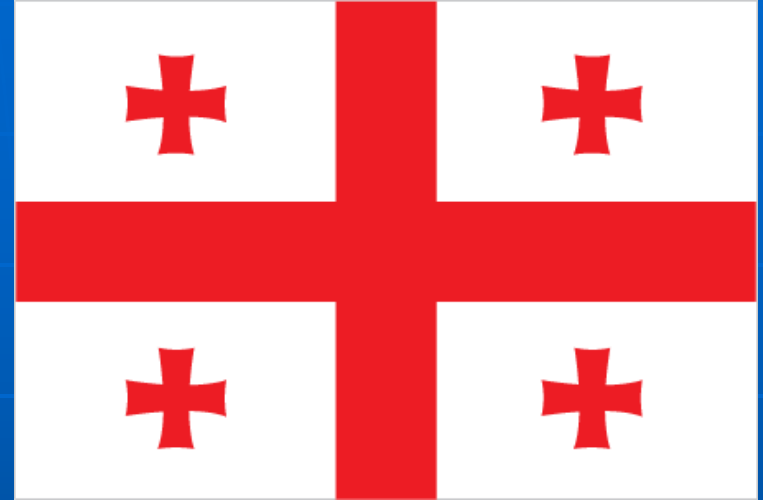
DOW Sanctions

- Water line extension ban
 - ❖ Water treated at the plant exceeds 85% of the rated design flow rate based on an annual average
 - ❖ No additional water line extensions unless requested of and approved by DOW—essentially stops growth
 - ❖ Water budgets
- Tap-on Ban (in addition to water line extension ban)
 - ❖ Water treated at the plant exceeds 95% of the rated design flow rate based on an annual average
 - ❖ No additional taps unless requested of and approved by DOW

Theft of Service

- Theft of service can be
 - ❖ Bypassing a customer meter
 - ❖ Unauthorized use of a fire hydrant
 - ❖ Unapproved tap into an existing water main
 - ❖ Unapproved water line extensions
- If found or suspected, should be included in water loss calculations
- DOW can issue violations for unapproved water line extensions
- Theft of service is typically handled at the water system level through local authorities

QUESTIONS?



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THANK YOU