



Implementation of DRBC's Water Loss Accountability Rule

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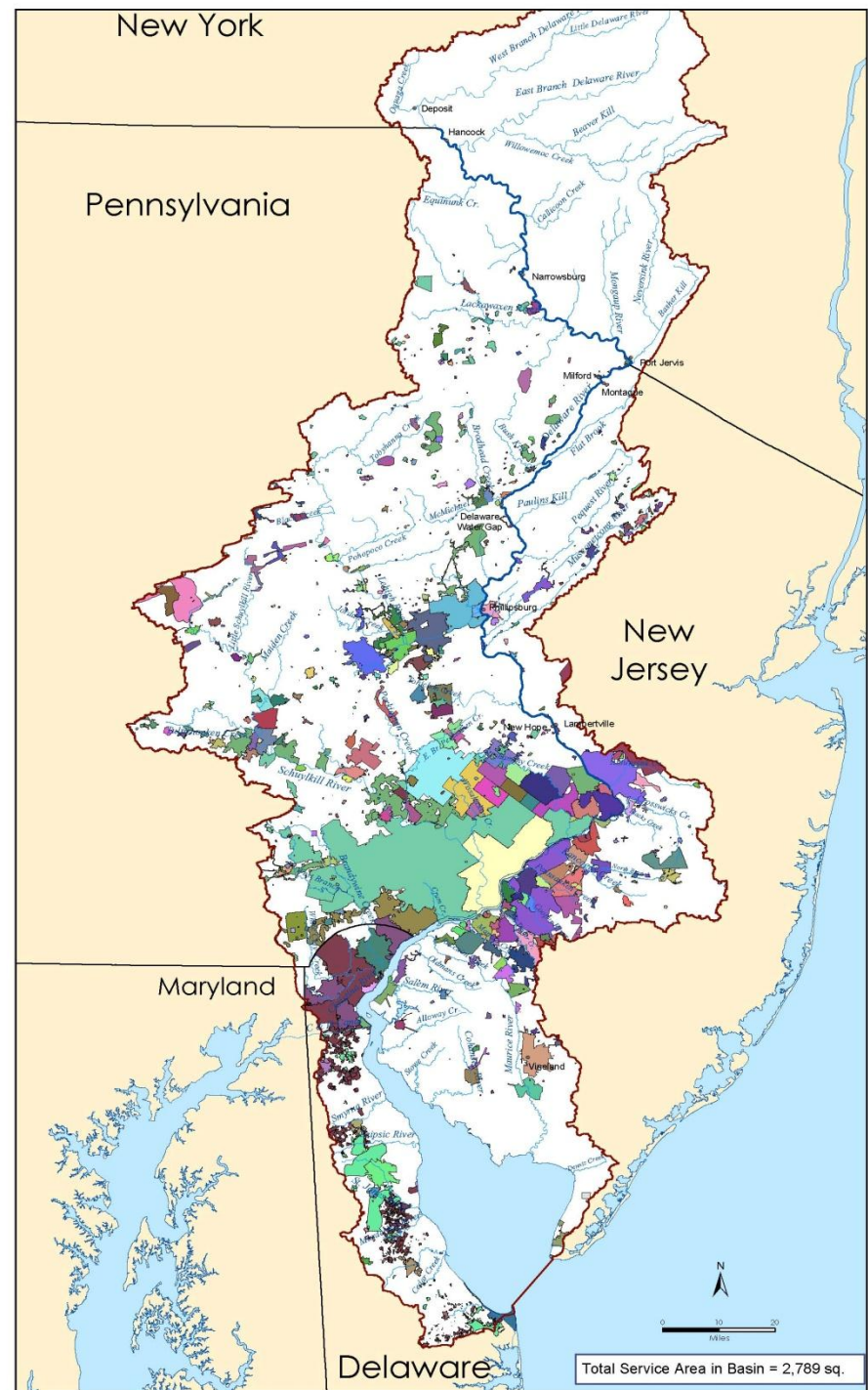
December 8, 2011



Water Service area in the Delaware River Basin

- Approx. 21% of Basin covered by service area
- 80% of basin residents (6.7 million customers)
- Approx. 750 systems
- 2nd largest water use sector in the Basin
- Total PWS withdrawals:

875 MGD
(plus exports)




Water Conservation in the Delaware River Basin



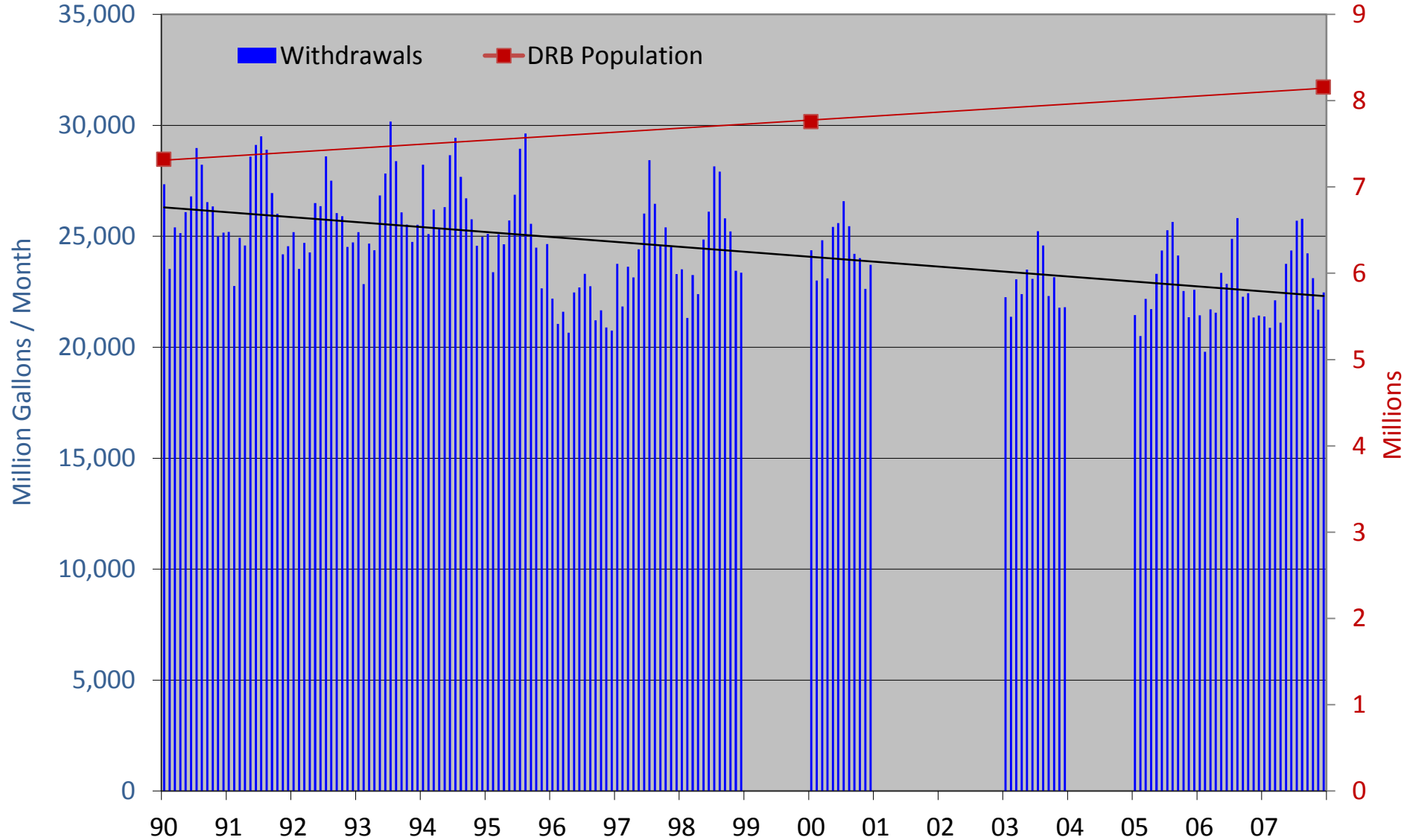
- Tocks Island Dam Project deauthorized (1975)
- Need to look at managing supply AND demand:
 - Good Faith Agreement (1983)
- Ground Water Advisory Committee
- Southeastern PA Groundwater Protected Area (GWPA)
- Water Conservation Advisory Committee
- Water Conservation Regulations adopted late 1980's and early 90's...

History of DRBC Water Conservation Regs

- 1986:**  Source & Service Metering
- 1987:** Leak Detection & Repair (UFW)
- 1988:** Conservation Plumbing Standards
- 1992:** Water Conservation Pricing
- 2006-9:** Water Loss Accountability (WMAC)
- 2009-11:** Outreach / Voluntary Implementation
- 2012:** First year for new audit format
- 2013:** First reports due

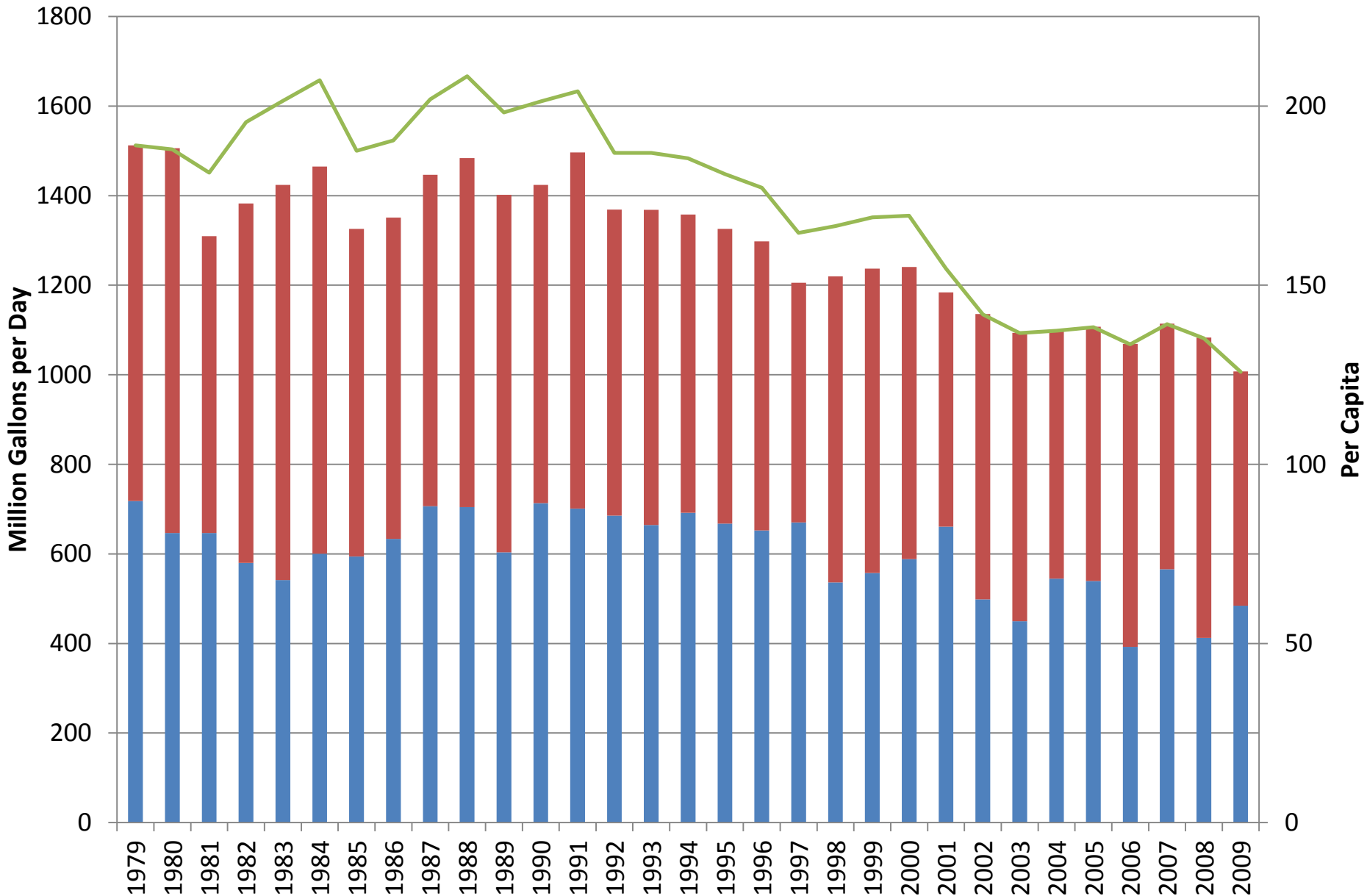
Aggregated Withdrawals of 40 Public Water Supply Systems in the DRB (Million Gallons / Month)

Trendlines 1990 - 2007: Approximately **15% decline** in withdrawals
Approximately **13% increase** in population



New York City Water Use Trends

■ Non-DRB water ■ DRB water — Per Capita (Gallons per person per day)



So, what's next?



Water Loss Accountability

Why should systems be accountable?

- Water losses are significant - USGS estimates 6 Billion gallons/day
- Lost Water is Out of Sight & Out of Mind
- Lost Revenues estimated at >\$1 Billion/year
- Conserve valuable natural resources
- Control Indirect Costs
 - Business disruption
 - Emergency Repair more expensive than proactive maintenance
 - Catastrophic Failures: property damage



Catastrophic System Failure





Why We Need to Manage Water System Losses

- Water taken that doesn't reach the customer is better left at the source.
- An estimated 150 million gallons per day is physically lost from public water supply distribution systems in the Delaware River Basin
- Water purveyors need to operate an efficient system, cost savings
- Public Perception: water suppliers need to be good stewards of the resource





What prompted DRBC rule change?

- Reporting inconsistencies
- Range of reported “Unaccounted for Water”:
 - High: 51%
 - Low: -12% (yes, that’s a negative)
- UFW = vague / inadequate definition
- Inadequate metric: UFW as % of distribution input is a poor indicator
- Time to update regulations (20+ yrs)



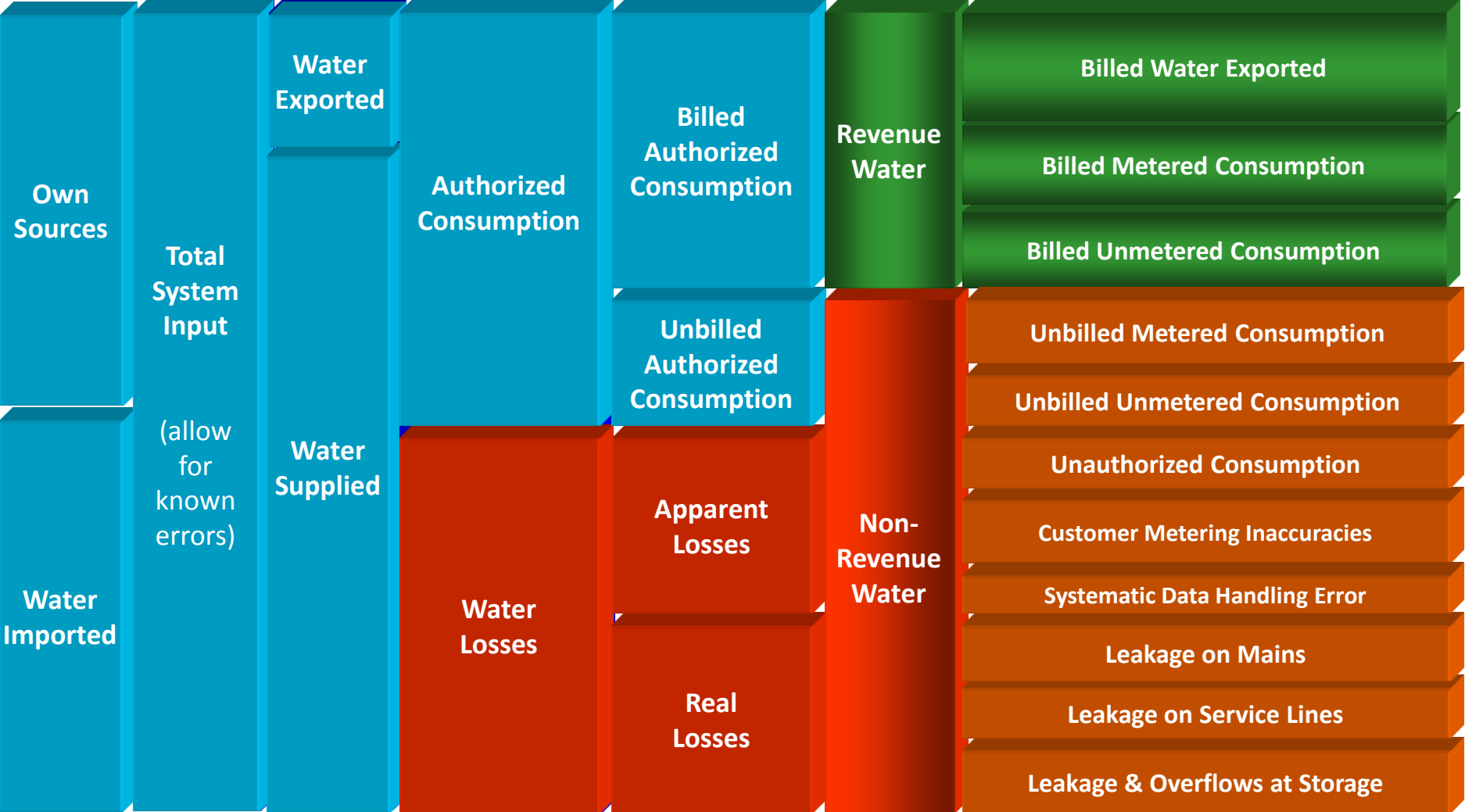
DRBC Rule change

~~Unaccounted for Water~~

IWA/AWWA Water Audit
Methodology



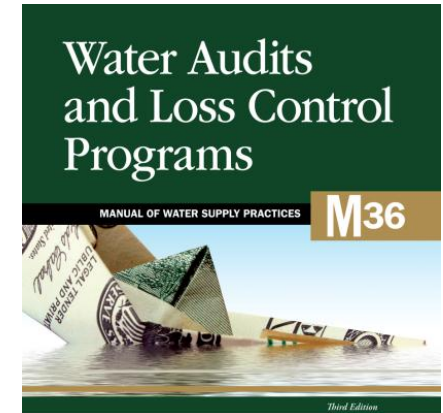
IWA/AWWA Water Audit Components



AWWA Resources

- Recent Water Audit manual published
- Free interactive audit tool available
- DRBC member of AWWA Water Loss Control Committee
- Data grading capability assesses the validity of the input data
- Instructions, definitions provided in software

www.awwa.org



American Water Works Association
 The Authoritative Resource on Safe Water™

AWWA WLCC Free Water Audit Software: Reporting Worksheet
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Water Audit Report For: []
 Reporting Year: []

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades.

PLEASE CHOOSE REPORTING UNITS FROM THE INSTRUCTIONS SHEET BEFORE ENTERING DATA

WATER SUPPLIED << Enter grading in column 'E'

Volume from own sources:	[7]	[]
Master meter error adjustment (enter positive value):	[7]	[]
Water imported:	[7]	[]
Water exported:	[7]	[]
WATER SUPPLIED:		0.000

AUTHORIZED CONSUMPTION

Billed metered:	[7]	[]
Billed unmetered:	[7]	[]
Unbilled metered:	[7]	[]
Unbilled unmetered:	[7]	0.000
AUTHORIZED CONSUMPTION:		0.000

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

WATER LOSSES (Water Supplied - Authorized Consumption) 0.000

Apparent Losses

Unauthorized consumption:	[7]	0.000
Customer metering inaccuracies:	[7]	0.000
Systematic data handling errors:	[7]	[]
Apparent Losses:		0.000

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	[7]	0.000
WATER LOSSES:		0.000

NON-REVENUE WATER

NON-REVENUE WATER:		0.000
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Enter a percentage less than 10% in the red cell (J42), or select Value option



Benefits of the IWA/AWWA Water Audit Methodology

- Industry standardized definitions and terminology
- Software outputs meaningful indicators:
 - gpd / mile mains
 - gpd / connection
 - ILI (infrastructure leakage index)
- Better indicators lead to better water management decisions

Leaders in Water Loss Accountability:

States / Agencies Advancing AWWA Water Audit Approach


- **DRBC**
- Texas
- New Mexico
- Virginia
- Georgia
- California
- North Carolina
- Tennessee
- Pennsylvania PUC
- Calgary, Alberta, Canada

Outreach Efforts

- Two targeted mailings to water users
- 2010: AWRA National Conference Panel
- 2011: NJ & PA regional presentations
- Publications / newsletters
- 2011: DRBC Workshop (April)
(Partnered with PWD, NJ American, Aqua PA)
- New DRBC webpage:

<http://www.nj.gov/drbc/water-audits.htm>

- Includes workshop materials



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Water System Audits and Water Loss Control

DRBC Rule Change:

In 2009, the Delaware River Basin Commission amended its Comprehensive Plan and Water Code to implement an updated water audit approach to identify and control water loss in the Basin. The new approach is consistent with the International Water Association (IWA) and American Water Works Association (AWWA) Water Audit Methodology that is considered a best management practice in water loss control.

The Commission's revised rules require the new reporting format to be used for the 2012 calendar year water audit, however, system operators are encouraged to implement the new audit format in 2011. The new rules are based on precise definitions and rational accounting procedures that result in a clearer understanding of the causes of water loss and allow system operators, utility managers, and regulators better target their efforts to improve water supply efficiency.



Leaking Pipe (photo courtesy of Halifax Water)

Widespread problem with large losses:

Nationwide, an estimated **six billion gallons per day** of water is taken from water resources and never reaches the customer; this is enough water to supply the drinking water needs of the ten largest cities in the United States. In the Delaware River Basin, this number is estimated at **150 million gallons per day**. Water suppliers are experiencing real water losses due to physical infrastructure failures (see photo at right) and apparent losses resulting from inaccurate meter readings and erroneous billing practices. As demand for water increases, it



Implementation Summary



- 2012: First mandatory audit; annual thereafter
- DRBC will have primacy for reporting, until States adopt similar programs
- Electronic reporting required (AWWA audit format)
- Tools already developed for audit data management



Conclusion

- DRBC has been a leader in water conservation programs that show proven results
- DRBC Rule change will help meet goals of minimizing water withdrawals and increasing system efficiency
- New audit method outputs more meaningful indicators:
 - targeting real losses
 - identifying financial costs of losses
- New approach will enable better water management decisions
- Water Loss Accountability Program continues DRBC leadership in water conservation