

# Water Loss Control

## Tools, Techniques, and Tips

**GINNY STERN**  
Office of Drinking Water  
Water Use Efficiency Program  
Washington State Department of Health

**PUBLIC HEALTH**  
ALWAYS WORKING FOR A SAFER AND  
HEALTHIER WASHINGTON



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

# Mission

**To protect the health  
of the people of  
Washington State  
by ensuring safe  
and reliable  
drinking water.**



# Water Use Efficiency (WUE) Program Requirements

- 💧 **Set goals in a public forum**
- 💧 **Include robust planning requirements**
- 💧 **Install meters by 2017**
- 💧 **Achieve a 10 percent leakage standard**
- 💧 **Submit WUE and metered data in an annual performance report**

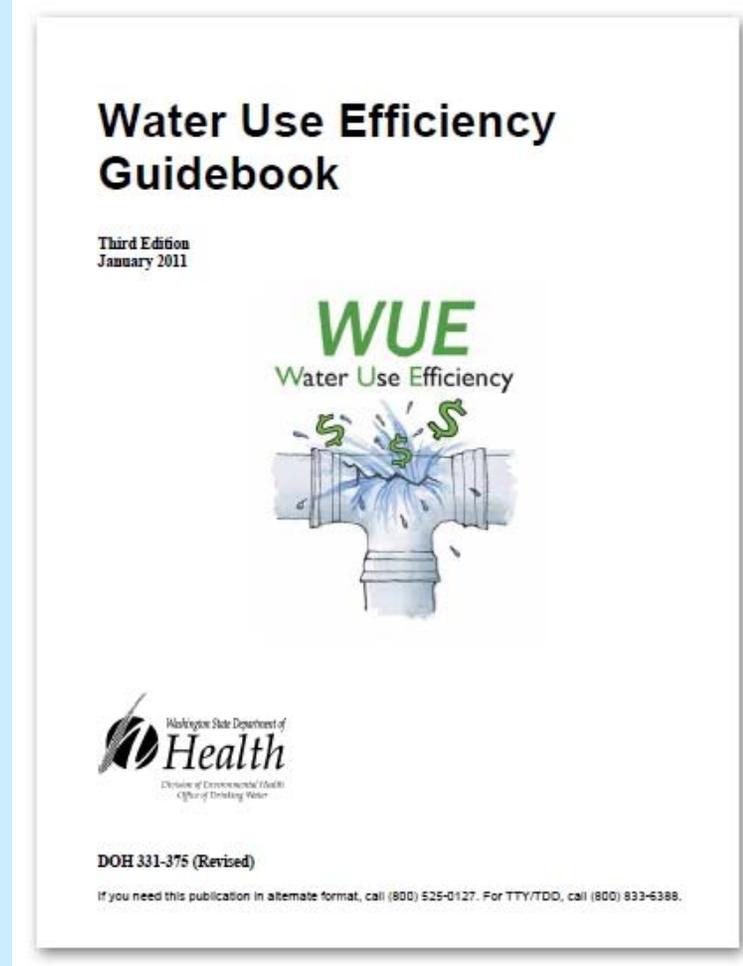
# Key Implementation Tools

## Online Annual WUE Reporting

The screenshot shows the homepage of the WUE Reporting Database. At the top left is the Washington State Department of Health logo. A navigation menu at the top right includes links for Home, Newsroom, Publications, and About Us. Below the logo is a breadcrumb trail: Home > Community and Environment > Drinking Water > Water System Design and Planning > Water Use Efficiency. A 'Print' button is located in the top right corner of the main content area. On the left side, there is a 'Quick Links' box containing five bullet points: WUE Home, WUE Guidebook, Print a WUE Annual Reporting Worksheet, Search for Completed WUE Report (with a note that the link goes to Sentry Internet), and Submit WUE Report. The main content area features the title 'WUE Water Use Efficiency' in large green letters. Below the title is an illustration of a leaking pipe with water spraying out and three green dollar signs floating above it. Underneath the illustration, the text reads 'Welcome to the WUE Annual Reporting Database' and a blue link 'Submit WUE Report Now' is provided.

<https://fortress.wa.gov/doh/eh/portal/odw/wue/default.aspx>

# Key Implementation Tools



# Water Loss Trivia

💧 **The American Society of Civil Engineers recently gave America's infrastructure a grade of \_\_\_ .**

▪ ***Answer: D***

# What's New for WUE in WA

## 💧 Water loss control website

[www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency/ControllingWaterLoss.aspx](http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency/ControllingWaterLoss.aspx)

### ▪ Emphasis on:

- New water loss technology
- Water audit software
- Funding options for repairing leaks
- Educational opportunities

## 💧 Water loss control focus group

# Alliance for Water Efficiency State Scorecard, 2012

- 💧 **Nationwide assessment of state laws and policies related to WUE**
- 💧 **Intended to highlight good state WUE policies and create healthy competition among states**
- 💧 **20 question survey, 40 possible points, each state received a grade**

# Alliance for Water Efficiency State Scorecard, 2012

## Rankings for PNWS states

	Total Points	National Ranking	Grade
WA	21.5	4th	B
OR	15.5	Tied 12th	B -
ID	3.0	Tied 37th	D

# How Washington Water Utilities Spend Their WUE Budgets

## 💧 Primarily used for:

### ▪ Meters

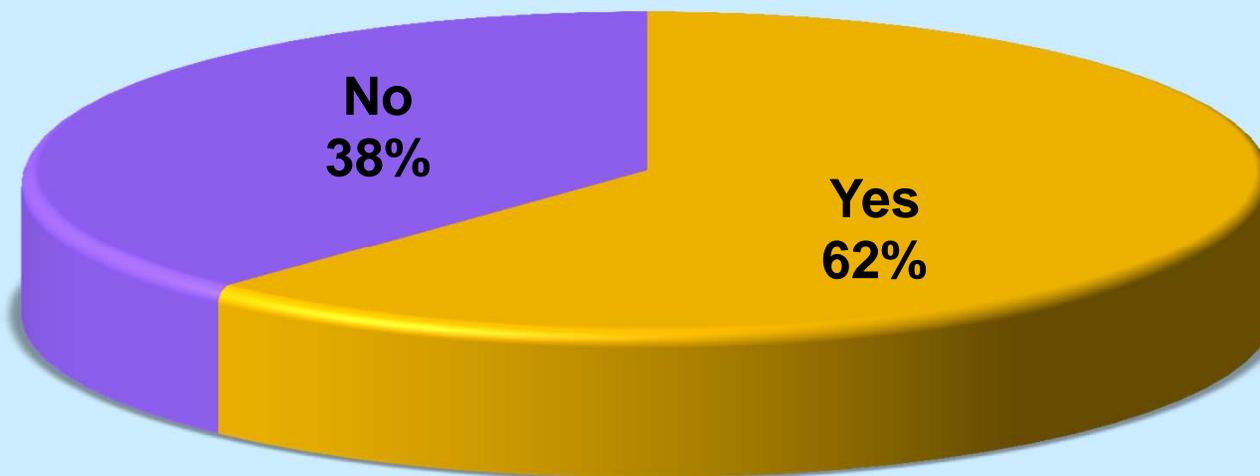
- Installation and repair
- Average cost = \$1,000 per home
- Replace with new AMR/AMI technology

### ▪ Finding and fixing leaks

- Recovers lost revenue
- Have more control over fixing leaks than customer use behavior



# Fully Metered Water Systems in 2012



# Compliance With Leakage Standard

## How to comply:

- 10 percent or less
- 20 percent or less for systems with 500 or fewer connections (must get permission from us)
- Develop and implement a water loss control action plan

# The Story on Leaks: Apparent Losses

## Poor data collection and equipment skew annual leakage percentage

- Old, inaccurate meters (source, service, and intertie)
- Unreliable or lost data (change in personnel)
- Inconsistent data collection, or not at all
- Broken meters
- Billing software glitches



# Evaluate Data Collection

## Ask yourself these questions:

- **Are you tracking unmetered authorized use?**
  - Flushing mains, fire department, cleaning tanks
- **Are your meters old or in disrepair?**
- **Are you collecting source and customer metered data on same yearly schedule?**

# Water Loss Trivia

💧 **Worldwide, *fire fighting* uses \_\_\_ to \_\_\_ percent of total production.**

- ***Answer: 0.4 to 0.9 percent***

## *Case Study:* **City of Bingen**

- 💧 **Population:** 720 residential
- 💧 **Location:** Klickitat County,  
shore of Columbia River
- 💧 **Three-year average water loss:**  
43.8 percent  
(39 percent in 2008, 54 percent in 2010)
  - **Two newspaper articles**
  - **City council: “Unacceptable”**



## *Case Study:* **City of Bingen (cont.)**

### 💧 **Industrial customer oversight**

- Meter multiplier of 1,000 not factored in for almost seven years
- Double whammy: High leakage **and** lost revenue

### 💧 **Actions taken**

Meter accuracy testing, zone meters, new six and eight inch meters at port, leak survey, industrial customer water audits

*Case Study:*  
**City of Mercer Island**

- 💧 **Population:** 22,700
- 💧 **Location:** King County, shore of Lake Washington
- 💧 **Source:** Purchase 100 percent of water from Seattle
- 💧 **Three-year average water loss:** 7.9 percent (down from 10.4 percent in 2007 to 3.0 percent in 2009)



*Case Study:*  
**City of Mercer Island (cont.)**

💧 **2010, Water Loss = -1.2 percent**

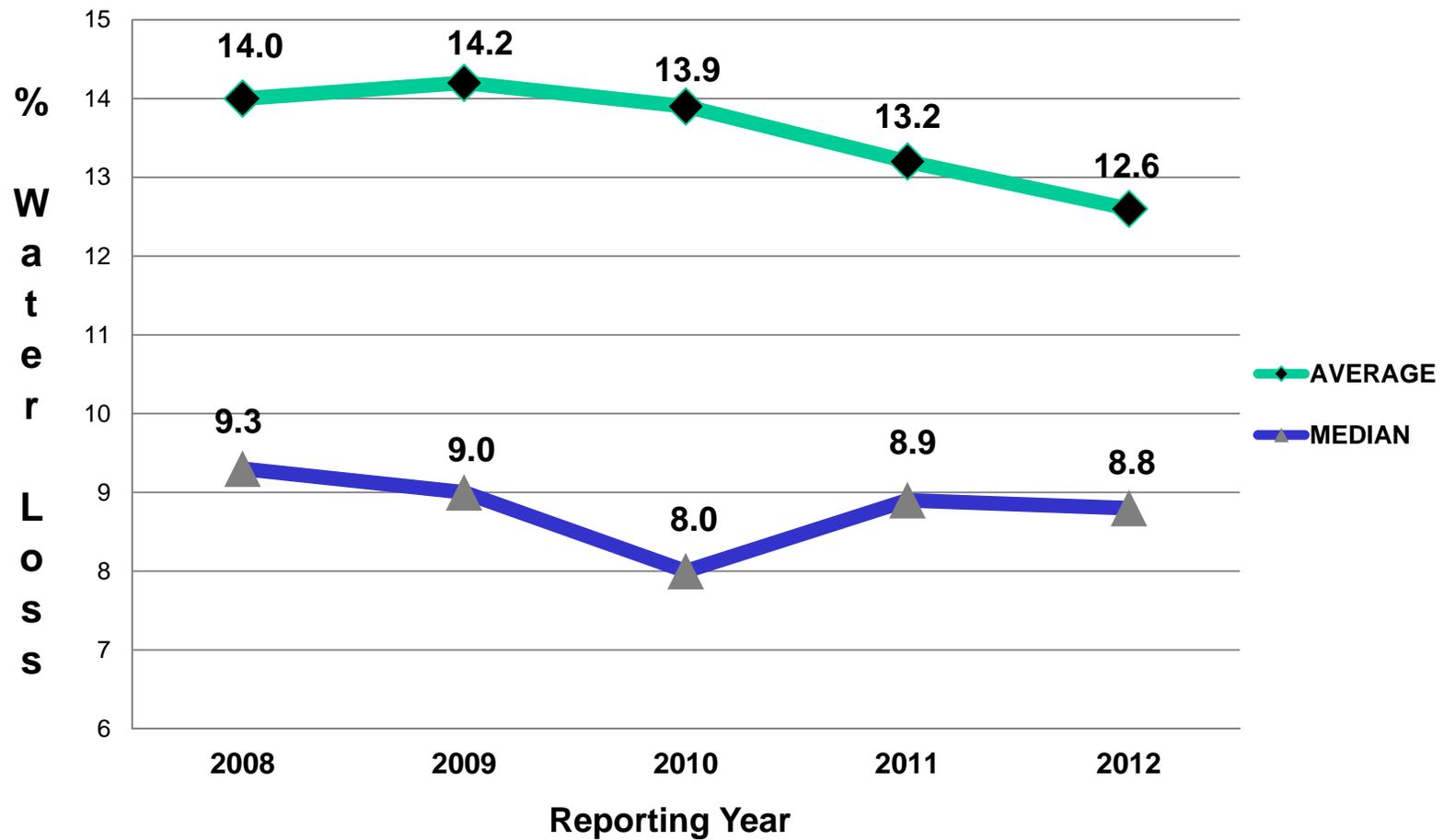
💧 **Actions taken**

- **Intertie meter calibration with Seattle**
  - Who pays for meter calibration?
  - How frequently?
- **Replaced six (12-16") meters ingoing/outgoing storage tank, \$50,000**

# Water Loss Trivia

- 💧 Each year, about \_\_\_ percent of the water systems in Washington report they sold more water than they pumped, resulting in negative leakage!
  - *Answer: 6 percent*

# State Average Annual Leakage Performance



# How We Enforce the 10 Percent Leakage Standard

- 💧 **Review the annual WUE report**
- 💧 **If three-year average exceeds 10 percent:**
  - **Send a violation letter**
  - **Offer technical assistance on how to complete a water loss action plan**
  - **Review and approve the plan, as necessary**
  - **New compliance strategy adopted for higher leakage**

# What is a Water Loss Control Action Plan?

- 💧 Documented effort to reduce leakage by implementing water loss control methods
- 💧 Timeframe for achieving the leakage standard
- 💧 Technical or economic concerns that prevent compliance
- 💧 Budget to fund the plan

# Funding Failing Infrastructure

- 💧 **Drinking Water State Revolving Fund**
  - Public health projects rank higher
- 💧 **Public Works Assistance Account**
  - *Redirected* funds from infrastructure to fund education (permanent)
  - Equivalent to \$277 million over next biennium
- 💧 **Energy efficiency rebate programs**
- 💧 **Rate increase**

# City of Port Angeles

## Six-Year Leak Performance

Year	Total Production	Authorized Consumption	Leakage Volume	Leakage Percentage	Three-year Leak Percentage
2007	1,141,000,000	899,000,000	242,000,000	21.20%	-
2008	1,088,620,000	886,245,277	202,374,723	18.60%	-
2009	1,006,112,000	849,119,719	156,992,281	15.60%	18.50%
2010	932,698,000	783,860,342	148,837,658	16.00%	16.70%
2011	909,663,992	761,117,781	148,546,211	16.30%	16.00%
2012	846,687,000	729,078,972	117,608,028	13.90%	15.40%

## City of Port Angeles (cont.)

# How to Increase Your Revenue

- 💧 **Sold less and pumped less water in 2012 than in 2011**
- 💧 **Yet, revenue increased by \$200,000**
  - **How did they do it?**
    - a) Rate increase
    - b) Rebate and/or loan programs
    - c) Lotto ticket winnings
    - d) None of the above

## City of Port Angeles, contd. How to Increase Your Revenue

- 💧 ***Answer: d) None of the above***
- 💧 **Replaced 305 large meters**
  - **1.5- to 8-inch meters**
- 💧 **Asked wastewater department to pay for half the cost of replacing meters**

# Water Loss Trivia

- 💧 In 2011, Washington water systems lost about     *billion gallons* of municipal water supply to physical leaks, poor accounting, and other unauthorized consumption.
  - *Answer: 26 billion gallons*
  - *Equal to almost 80,000 acre-feet*

# Questions?

**For more information:**

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**[www.doh.wa.gov/CommunityandEnvironment/  
DrinkingWater/WaterSystemDesignandPlanning/  
WaterUseEfficiency.aspx](http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency.aspx)**