

# **Water Loss Control – A Summary of Senate Bill 555**

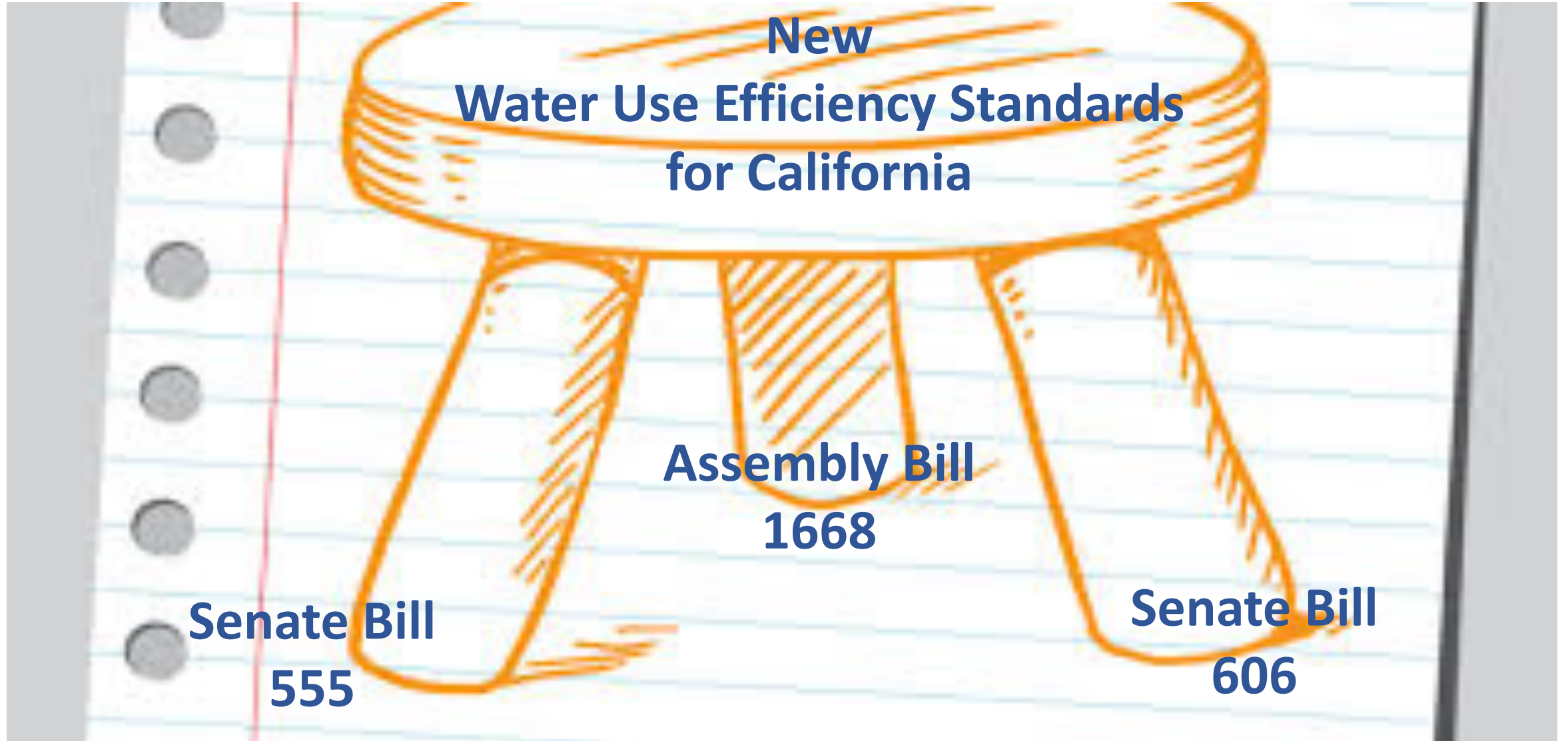
California Water Efficiency Partnership  
Peer to Peer 2019

# Presentation Content

- Enabling Legislation and Components of Water Use Efficiency
- Water Loss Control Component
- Water Audit Methodology
- Validation of Water Audit



# REGULATORY INFO



# Components of the Standards



## Water Use Efficiency

Indoor Water  
Use Standard

Water Loss  
Standard

Outdoor Water  
Use Standard

Commercial, Industrial, and Institutional Performance Measures



# New Conservation Standards

## Actual Water Use

(Section 10609.22)

=

Aggregate Residential Water Use  
(indoor and outdoor)

+

Aggregate Dedicated  
CII Irrigation Water Use

+

Distribution System Real Water Loss

## Efficient Water Use Objective

(Section 10609.20)

=

Aggregate Residential Indoor Use

+

Aggregate Residential Outdoor Use

+

Aggregate Dedicated CII Irrigation Use

+

Aggregate Distribution System Water  
Loss

+

Aggregate Approved Variances

+

Bonus Incentive

(up to 15% of Efficient Water Use Objective)

## Compliance

=

Actual Water Use is  $\leq$  Efficient  
Water Use Objective

# New Conservation Standards Timeline

Due Date:	What is Required:
November 1, 2023 and annually thereafter	Deadline to <u>calculate urban water use objective</u> and report to DWR
November 1, 2023 and annually thereafter	Deadline to <u>calculate the previous years' actual urban water use</u> and report to DWR
January 1, 2025	Abide by a standard for indoor residential water use of <u>52.5 gpcd</u>
January 1, 2027	Provide a <u>narrative</u> in addition to the supplement that describes the water <u>demand management measures</u> that the supplier plans to implement <u>to achieve its urban water use objective</u>
January 1, 2030	Abide by a standard for indoor residential water use of <u>50 gpcd</u>

# THE LAW ON WATER LOSS



# WATER LOSS REGULATORY INFO

## Senate Bill 1420 (2014)

- *Beginning in 2015, utilities must submit AWWA water audits with their UWMPs*

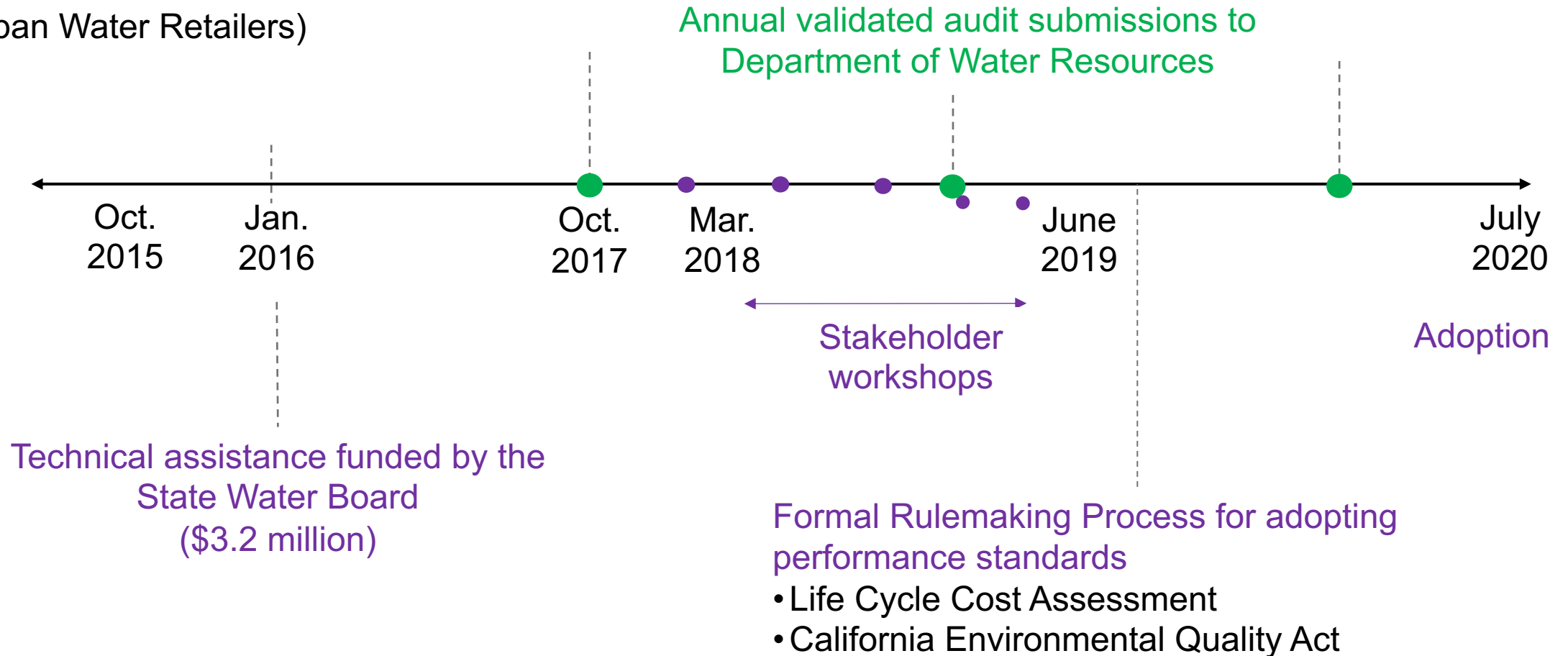
## Senate Bill 555 (2015)

- *A component of SB 606 and AB 1668*
- *Starting in October of 2017, Utilities must submit annually, validated water audits*
- *Utilities must achieve a volumetric standard assigned by the SWRCB*



# Senate Bill 555 (2015)

Senate Bill 555  
(Urban Water Retailers)



# New Conservation Standards Timeline

## Basic Requirements

### Requirement 1:

- Audits must utilize the method adopted by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0
- The DWR shall adopt rules for validated water audits:
  - Process for validating audits
  - Technical qualifications of validators
  - Attested by CFO, Chief Engineer, or GM
  - Method for submitting water loss audit reports

# New Conservation Standards Timeline

## Basic Requirements (Cont.)

### Requirement 2:

- Starting in 2017, Urban Retail Water Suppliers must submit validated water loss audit reports annually by October 1, including steps take to increase validity

SYSTEM INPUT VOLUME	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
		UNBILLED AUTHORIZED CONSUMPTION	BILLED UNMETERED CONSUMPTION	
	WATER LOSSES	APPARENT LOSSES	UNBILLED METERED CONSUMPTION	NONREVENUE WATER
			UNBILLED UNMETERED CONSUMPTION	
CUSTOMER METER INACCURACIES				
UNAUTHORIZED CONSUMPTION				
		DATA HANDLING ERRORS		
		REAL LOSSES		

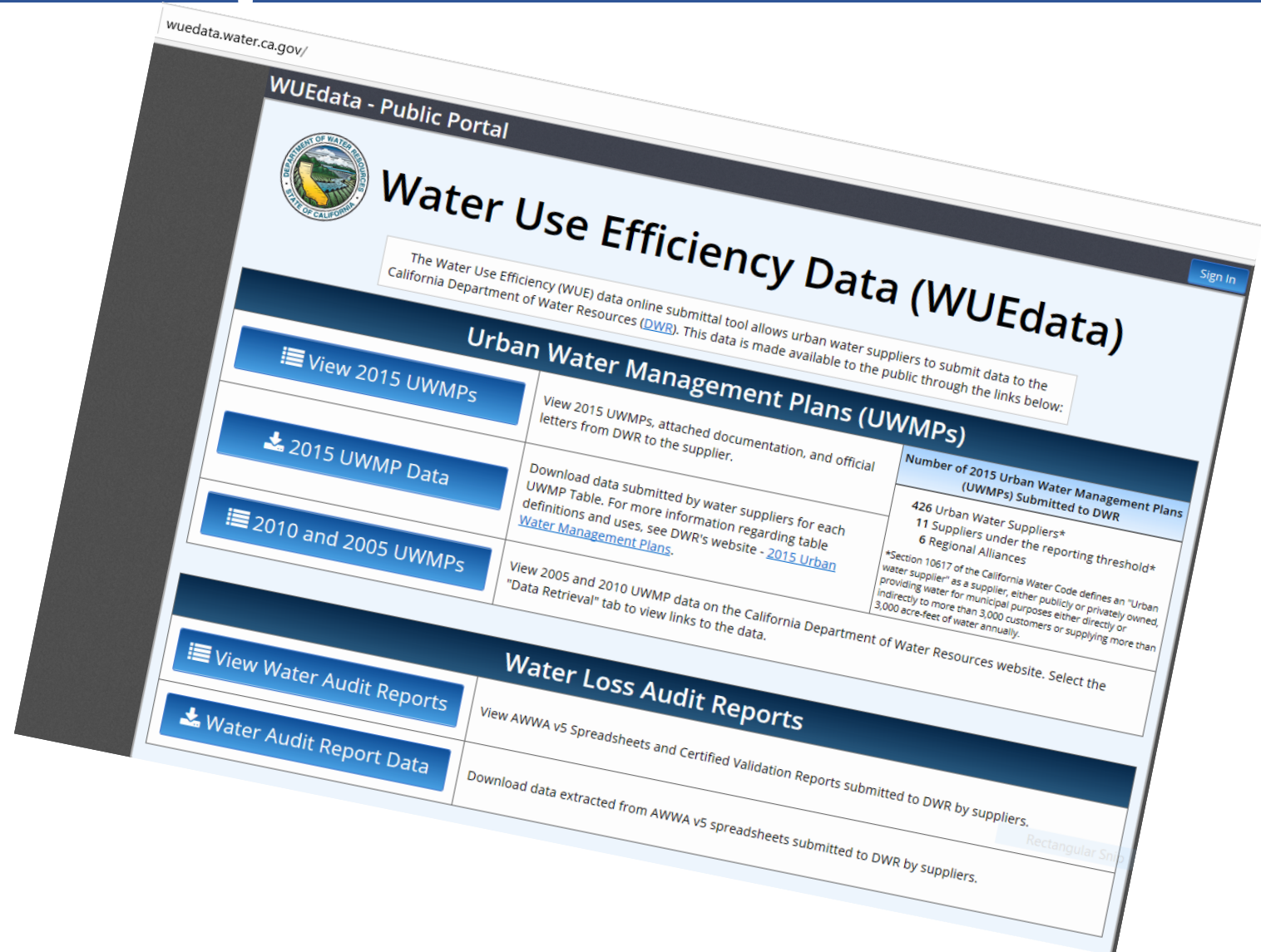
The screenshot displays the 'AWWA Free Water Audit Software: Reporting Worksheet'. It includes sections for 'WATER SUPPLIED', 'AUTHORIZED CONSUMPTION', 'WATER LOSSES (Water Supplied - Authorized Consumption)', 'REAL LOSSES (Current Annual Real Losses or CARL)', and 'NON-REVENUE WATER'. The software calculates various metrics such as 'Unbilled metered consumption', 'Unauthorized consumption', 'Customer metering inaccuracies', and 'Systematic data handling errors'. The final calculated values are: WATER SUPPLIED: 1,620,406 MG/Y; AUTHORIZED CONSUMPTION: 862,755 MG/Y; WATER LOSSES: 757,653 MG/Y; REAL LOSSES: 757,653 MG/Y; NON-REVENUE WATER: 757,653 MG/Y. The software also includes a 'Master Meter and Supply Error Adjustments' section with input fields for 'Port' and 'Value'.

# New Conservation Standards Timeline

## Basic Requirements (Cont.)

### Requirement 3:

- The DWR will post all validated water loss audit reports on its website in a manner that allows for comparison across water suppliers





# New Conservation Standards Timeline

## Basic Requirements (Cont.)

### Requirement 4:

- The DWR to provide technical assistance to guide Urban Retail Water suppliers' water loss detection programs

### Currently Available Technical Assistance:

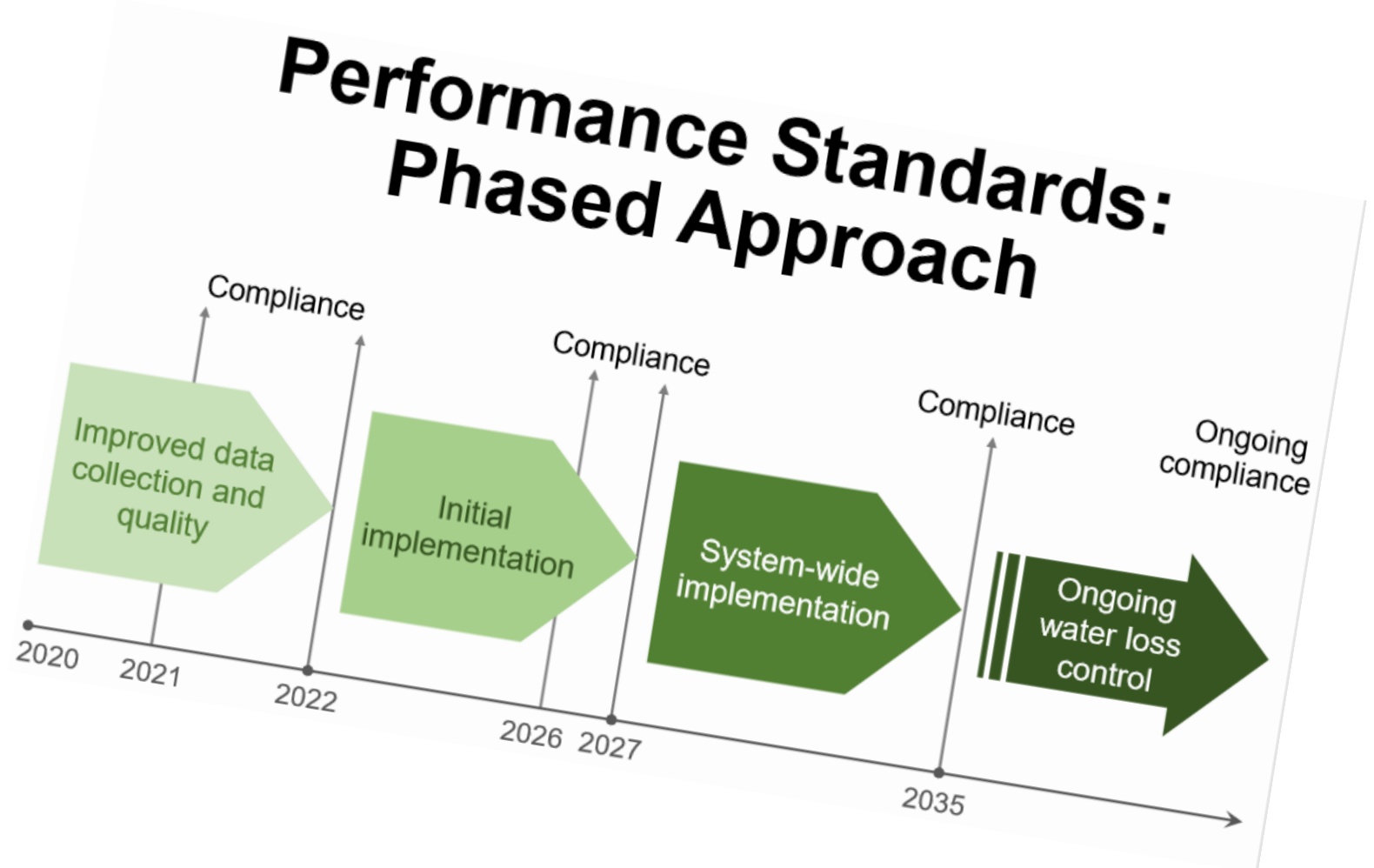
- DWR staff assistance to compile water balance
- Leak Detection Equipment on loan from DWR's regional offices
- Other Technical Assistance to be determined
  - Be sure to give DWR your ideas

# New Conservation Standards Timeline

## Basic Requirements (Cont.)

### Requirement 5:

- The State Water Resources Control Board, no later than July 1, 2020, to adopt rules requiring Urban Retail Water Suppliers to meet performance standards for the volume of water losses



Much more detail to be presented at Water Loss 201 @ 11 am today

# New Conservation Standards Timeline

## Basic Requirements (Cont.)

### Requirement 6:

- The State Water Resources Control Board to contribute up to \$400k for water loss audit report validation assistance
  - Cal-Nev AWWA TAP Program (concluded)

The screenshot shows the website for the American Water Works Association California-Nevada Section. The header includes the organization's name, a navigation menu with links like 'ABOUT THE SECTION', 'EVENTS & CLASSES', 'MEMBERSHIP', 'CERTIFICATION', 'ADVOCACY', 'COMMUNICATIONS', and 'WATER LOSS'. There are also links for 'Sign In', 'Create Account', and a 'Cart' icon. A search bar is located on the right.

The main content area features a circular logo for the 'WATER LOSS CONTROL COLLABORATIVE' and a paragraph stating: 'CA-NV AWWA is leading a broad group of stakeholders that came together in 2015 to combat water loss in California. The California Water Loss Control Collaborative includes utility personnel, industry organizations, non-profits as well as state entities.'

Below this, a section titled 'The Collaborative includes:' lists several bullet points:

- CA-NV AWWA Water Loss Control Committee – share best practices, non-revenue water challenges and successes, discuss technology innovations, and participate in planning conference technical sessions and specialty workshops. Coordinates with the AWWA Water Loss Control Committee
- California Water Loss Collaborative Steering Committee – overarching coordination and program implementation between Collaborative activities
- [Water Audit Validator](#) (WAV) Certificate Program – Water Audit Validators examine water loss audit inputs prior to audit submission to the California Department of Water Resources (per SB555).
- Partnership for Saving Water Program – a water loss control peer-to-peer bench marking and recognition program. To be developed in 2018.

A blue banner below the list reads: 'The Water Loss Technical Assistance Program Final Report is now available! [Click here to read it.](#)'

Below the banner, a paragraph states: 'For more details on the dates and resources of the Water Loss TAP, please visit [www.californiawaterloss.org](http://www.californiawaterloss.org)'

The bottom section, titled 'The Water Loss Control Technical Assistance Program (WLTAP)', states: 'The Water Loss Control Technical Assistance Program (WLTAP) has been funded wholly or in part by the United States Environmental Protection Agency and the State Water Resources Control Board, through the State Revolving Fund set-aside for technical assistance. We are grateful to the EPA and the Water Board for their support.'

On the right side of the page, under the heading 'Additional Information', there are several links:

- [Join the Collaborative](#)  
We encourage you to participate in the program. [Click here to join...](#)
- [Water Loss Control News](#)  
[Archived Announcements and Press Releases](#)
- [Resources](#)  
[Links to various tools and resources](#)
- [Contacts](#)  
[Directory of affiliated organizations and partners](#)
- [Water Audit Validator Certificate](#)

At the bottom right, a paragraph states: 'The Water Audit Validator course is a 2-day program designed to qualify individuals to perform Level 1 water audit validations in California.'

# WATER AUDIT METHODOLOGY





# AWWA WATER AUDIT METHODOLOGY

- Industry Standard
- Defaults included
- 20 potential inputs
- 10 inputs for typical utility
- [www.awwa.org/waterlosscontrol](http://www.awwa.org/waterlosscontrol)

SYSTEM INPUT VOLUME	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
			BILLED UNMETERED CONSUMPTION	
		UNBILLED AUTHORIZED CONSUMPTION	UNBILLED METERED CONSUMPTION	NONREVENUE WATER \$\$\$ ●●●
			UNBILLED UNMETERED CONSUMPTION	
	WATER LOSSES	\$\$\$ APPARENT LOSSES \$\$\$	CUSTOMER METER INACCURACIES	
			UNAUTHORIZED CONSUMPTION	
			DATA HANDLING ERRORS	
		●●● REAL LOSSES ●●●		

*AWWA Water Audits and Loss Control Programs  
(M36 Manual)*

# AUDIT DATA

## Supply Data

- Produced
- Purchased
- Metering & testing

## Consumption Data

- Billed water
- Unbilled water
- Meter reading & billing cycle data

## Meter Data

- Meter inventory
- Testing policy
- Testing data

## System & Cost Data

- Length of mains
- Connections
- Pressure
- Operating costs

# AUDIT PERFORMANCE INDICATORS

FINANCIAL INDICATORS	UNITS
<b>NRW volume</b> as % of Water Supplied	%
<b>NRW value</b> as % of operating cost	%

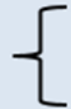
OPERATIONAL EFFICIENCY INDICATORS	UNITS
<b>Apparent Losses</b> per Service Connection per Day	gal / conn / day
<b>Real Losses</b> per Service Connection per Day	gal / conn / day
<b>Real Losses</b> per Service Connection per Day per PSI	gal / conn / day / PSI
<b>Infrastructure Leakage Index</b>	<i>ratio</i>

# AUDIT PERFORMANCE INDICATORS

\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 47 out of 100 \*\*\*

## Performance Indicators:

Financial:



Non-revenue water as percent by volume of Water Supplied:

11.8%

Non-revenue water as percent by cost of operating system:

1.9%

Real Losses valued at Variable Production

Operational Efficiency:



Apparent Losses per service connection per day:

5.14

gallons/connection/day

Real Losses per service connection per day:

53.38

gallons/connection/day

Real Losses per length of main per day\*:

N/A

Real Losses per service connection per day per psi pressure:

0.75

gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL):

66.17

million gallons/year

?

Infrastructure Leakage Index (ILI) [CARL/UARL]:

3.52



# Water Audit Validation



# Level 1 Validation

## What is Validation?

- Top-down review of supporting documentation for water audit
- Review of input derivations
- Affirmation of operational policies and practices to data grades
- Documentation of basis for inputs and data grades
- Flag indicators of hidden inaccuracies requiring further investigation

## Validation aims to:

- Identify and appropriately correct errors in data and application of methodology
- Evaluate and communicate uncertainty in water audit data inputs



# Level 1 Validation

## **Validation Methodology:**

- Collect – the audit and required supporting documentation
- Examine – initial performance indicators
- Validate – audit inputs (volumes, values, validity grades)
- Re-Examine – final performance indicators
- Document – results and propose next steps/improvements

# Questions?

**Be sure to stick around for Water Loss 201: Technical Power Hour**

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