



California Water Loss Control Collaborative –  
Water Loss Technical Assistance Program







## CALIFORNIA WATER LOSS CONTROL COLLABORATIVE

### Water Loss Technical Assistance Program


*Wave 1 Workshop*









# Warmup!










## Water Loss TAP



*Your Program Management Team*

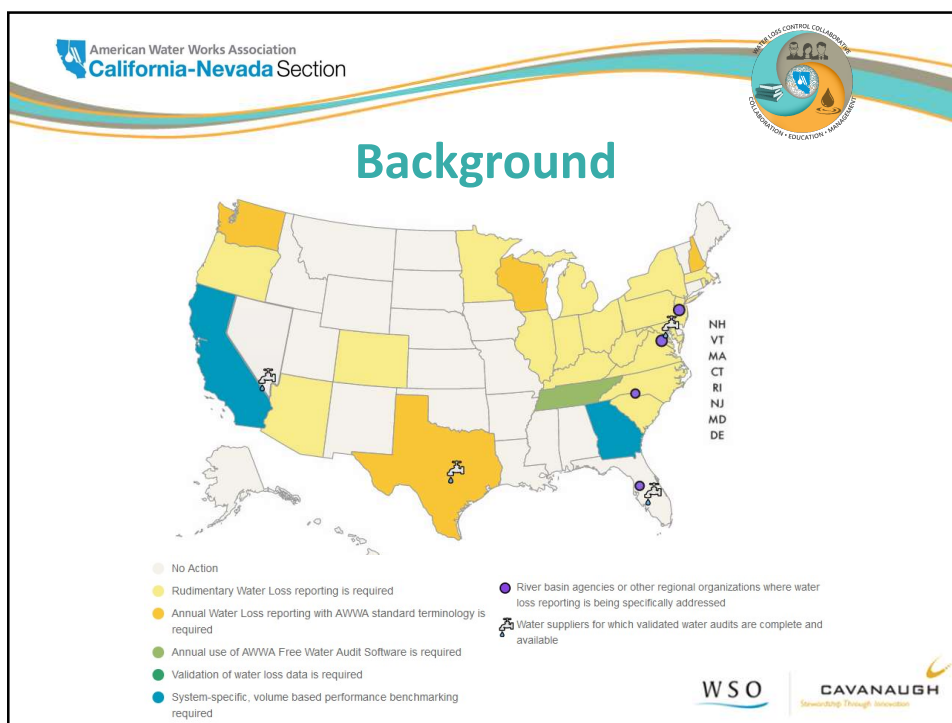
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# Water Loss TAP: Overview & Objectives





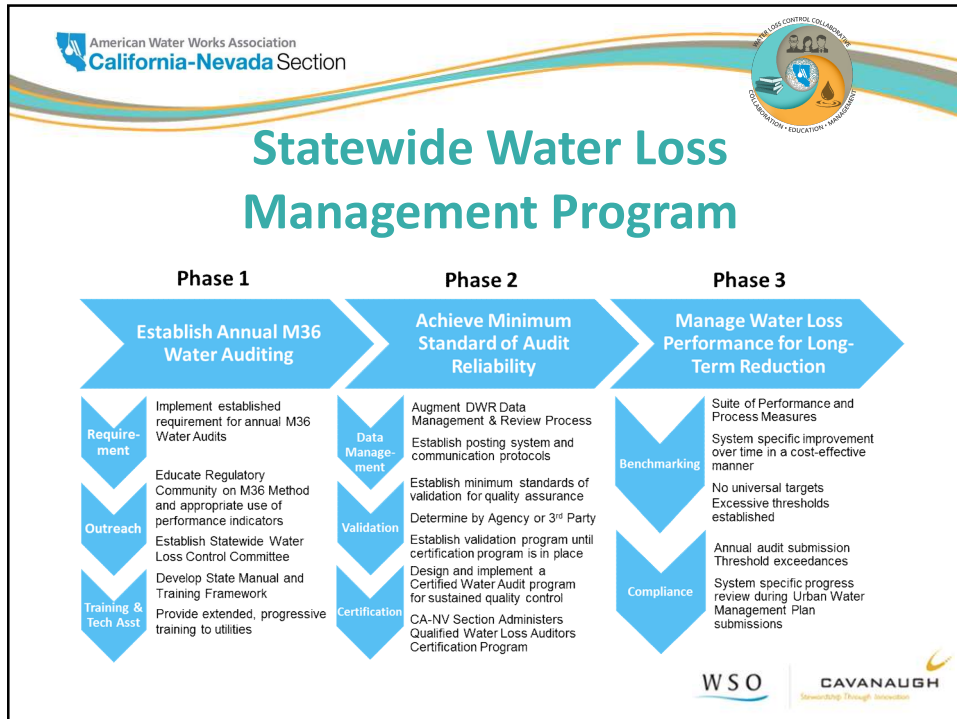
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## Background

- October 9, 2015: Governor signs Wolk Urban retail water suppliers: Water Loss management bill
- Senate Bill 555** requires *all urban water suppliers in California to conduct validated annual Water Loss audits*



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The slide features the same logos as the first slide. The title 'Why the TAP?' is centered in large teal letters. Below the title, three key points are listed in orange and black text:

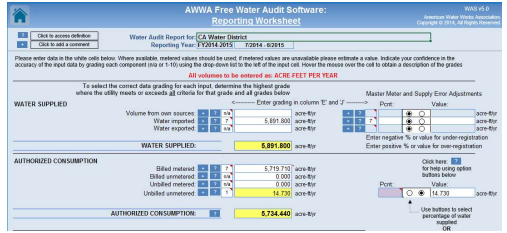
- By participating in the Water Loss TAP, you will comply with Senate Bill 555 and DWR regulation.**
- You will also learn more about your utility's water distribution efficiency and data systems!***
- You will be able to start water loss control planning.**



Logos for WSO and CAVANAUGH are at the bottom right.






## Water Loss TAP Benefits

- *Assistance with SB 555 compliance*
- *Contribute to broader conservation efforts*
- *Provide insight for utility operation & revenue improvement*



## Water Loss TAP

### Water Loss TAP Goals:

- *Training on AWWA Water Audit Methodology*
- *Level 1 Validation of Water Audits*

WAVE 1

in-person work session

WAVE 2



teleconference work session

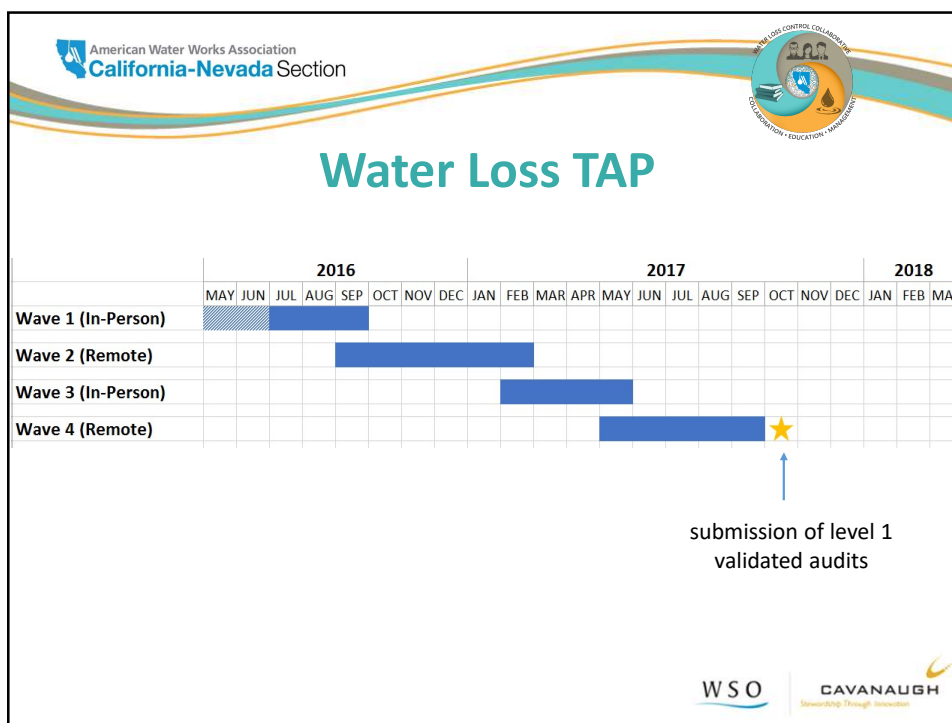
WAVE 3

in-person work session

WAVE 4

teleconference validation session



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## Your TAP Team

Who should participate in the TAP?

Conservation

Supply & Operations

Billing & Finance

Engineering

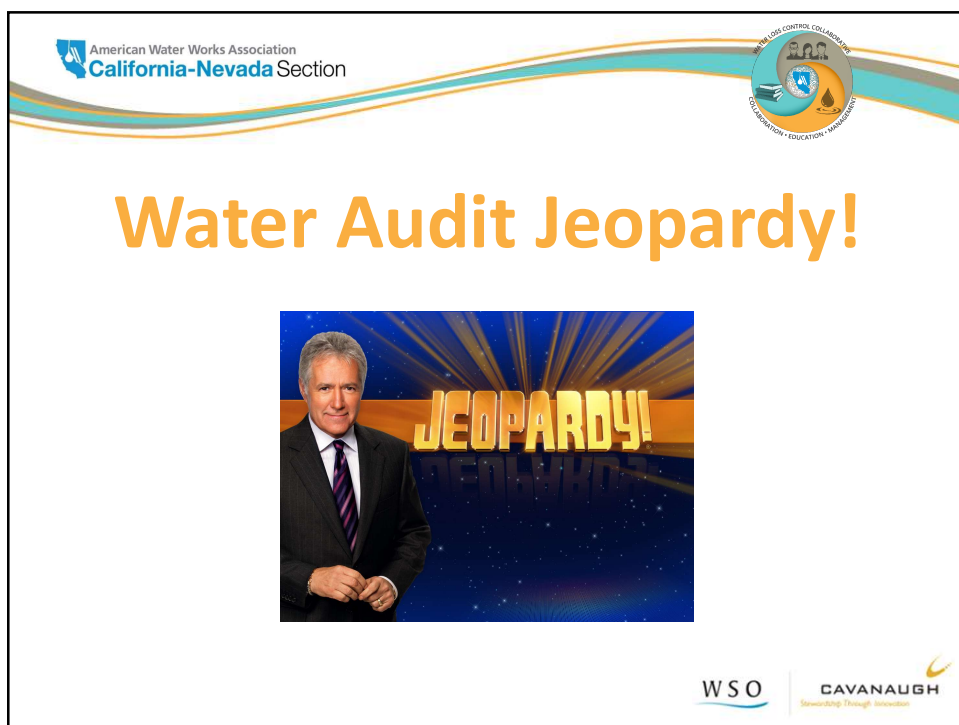
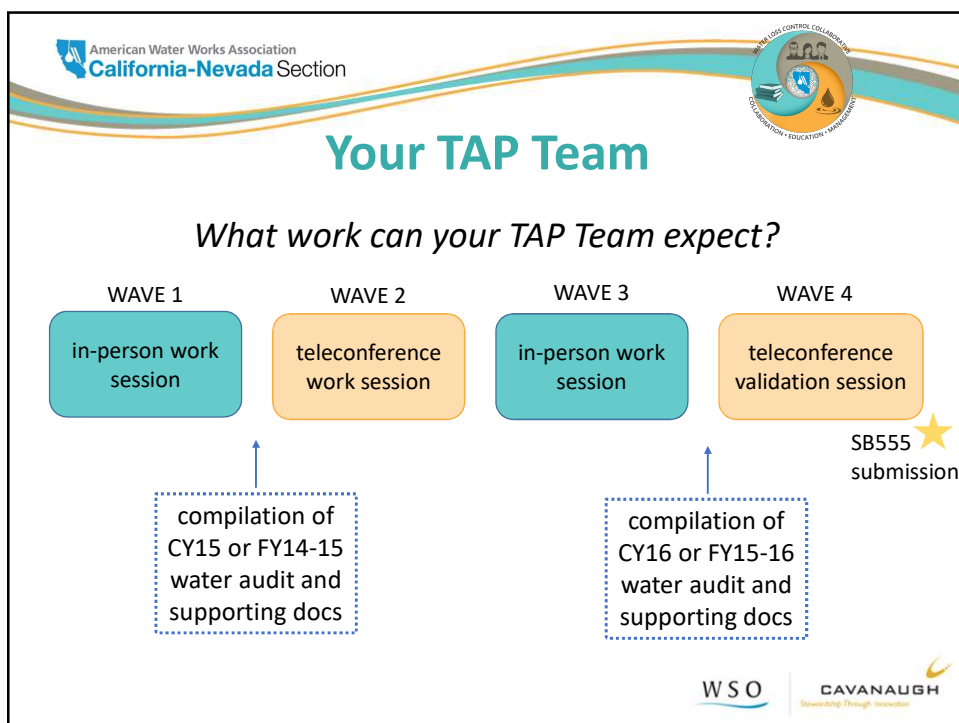
who is responsible for



*supplying audit data?*

*submitting the audit?*

*coordinating schedules?*

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## Water Audit Experience



*raise your hand if....*

1. You are familiar with your distribution system's level of Water Losses?
2. You have completed a water audit in the AWWA Water Audit Software?
3. You have participated in evaluating the data validity score for at least one Audit Software input?
4. You have reviewed a dataset (ie daily production volumes, billing data, measured pressure values) for the purposes of determining a value for the AWWA Audit software?





## AWWA Water Audit :

- What is a water audit?
- What are water audit volumes?













## Water Audit

1. Systematically account for known water volumes to estimate volumes of **Water Loss**.
2. Evaluate **data source reliability**.
3. **Communicate** water distribution efficiency.











## The Water Balance

### 1. Account for volumes...

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

- Mass balance – process of elimination*
- Account for all water*
- Accuracy matters!*









## Water Losses

### 1. ...Estimate volumes of Water Loss!

Apparent Losses





Real Losses



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## Water Audit

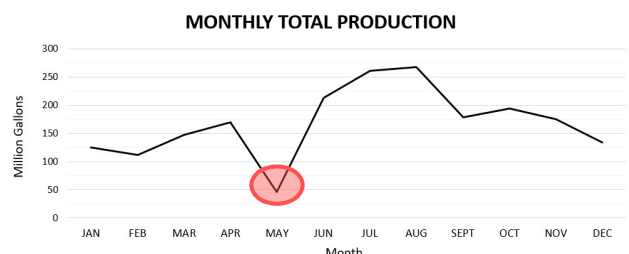
### 2. Evaluate data reliability

Complete?

Consistent?

Accurate?

MONTHLY TOTAL PRODUCTION



Month	Production (Million Gallons)
JAN	120
FEB	110
MAR	140
APR	170
MAY	50
JUN	210
JUL	260
AUG	260
SEPT	180
OCT	200
NOV	180
DEC	140

*Does the data story make sense?*

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## Water Audit



### 3. Communicate water distribution efficiency

customized performance indicators

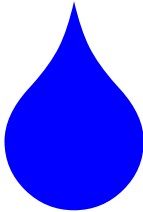


**financial value** of Water Losses



**\$ \$ \$**







## Water Audit

volumes	values	validity
		







## Water Audit Volumes



The big volumes...


Water Supplied


Authorized Consumption

Water Losses

*each volume is composed of sub-volumes*












## Water Supplied

WATER SUPPLIED	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		



## Water Supplied



$$[ \text{inputs} ] - [ \text{exports} ]$$



Volume from  
Own Sources

Water  
Imported

Water  
Exported


*captures all the potable water input to the distribution system to serve your customers*





## Water Supplied



*Volume from Own Sources*





*groundwater*  
*surface water*

Which meters?


Where are the meters?







## Water Supplied



### *Water Imported*



Which meters?


How is Water Imported tracked?





## Water Supplied



### *Water Exported*





*bulk water sales*  
*supplements to raw/reclaimed systems*

Which meters?

How is Water Exported tracked?





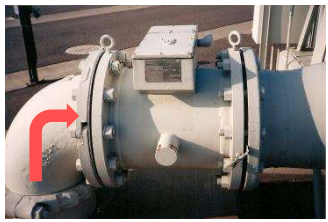




## Water Supplied


### Master Meter Error Adjustment


How accurate are Water  
Supplied meters?

*electronic calibration*  
*volumetric accuracy testing*














## Authorized Consumption



WATER SUPPLIED	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
			BILLED UNMETERED CONSUMPTION	
		UNBILLED AUTHORIZED CONSUMPTION	UNBILLED METERED CONSUMPTION	NONREVENUE WATER
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			UNAUTHORIZED CONSUMPTION	
			DATA HANDLING ERRORS	
		REAL LOSSES		













## Authorized Consumption


 billed and unbilled 

 metered and unmetered 

How much **water is used** for all intended purposes?  
**How accurate** are tracking mechanisms?










## Billed Metered Authorized Consumption

WATER SUPPLIED	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
			BILLED UNMETERED CONSUMPTION	
		UNBILLED AUTHORIZED CONSUMPTION	UNBILLED METERED CONSUMPTION	NONREVENUE WATER
			UNBILLED UNMETERED CONSUMPTION	
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		REAL LOSSES		



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## Other Authorized Consumption

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

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## Other Authorized Consumption

**Billed Unmetered**

**Unbilled Metered**

**Unbilled Unmetered**





District use?


City use?


Special customers?

Exemptions?












## Now we know Water Losses!


WATER SUPPLIED	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
			BILLED UNMETERED CONSUMPTION	
		UNBILLED AUTHORIZED CONSUMPTION	UNBILLED METERED CONSUMPTION	
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# Water Losses

[ Water Supplied ] — [ Authorized Consumption ] =  


## Water Losses




Real Losses      Apparent Losses

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# Apparent Losses

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

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## Apparent Losses

water volume that reaches an end user  
***but is not registered or properly tracked***  
(and so you're not paid)



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## Apparent Losses

often referred to as “**paper losses**”

---

reducing Apparent Losses **increases revenue**  
but creates ***no new water***

**\$ \$ \$**

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## Apparent Losses


*How much water is delivered but not registered (or paid for)?*



1. Customer Metering Inaccuracies
2. Unauthorized Consumption (theft)
3. Systematic Data Handling Errors







## Real Losses

WATER SUPPLIED	AUTHORIZED CONSUMPTION	BILLED AUTHORIZED CONSUMPTION	BILLED METERED CONSUMPTION	REVENUE WATER
			BILLED UNMETERED CONSUMPTION	
		UNBILLED AUTHORIZED CONSUMPTION	UNBILLED METERED CONSUMPTION	NONREVENUE WATER
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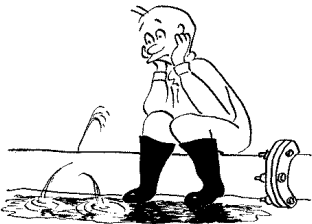
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## Real Losses

often referred to as “physical losses”

leaks      seeps      breaks



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## Real Losses

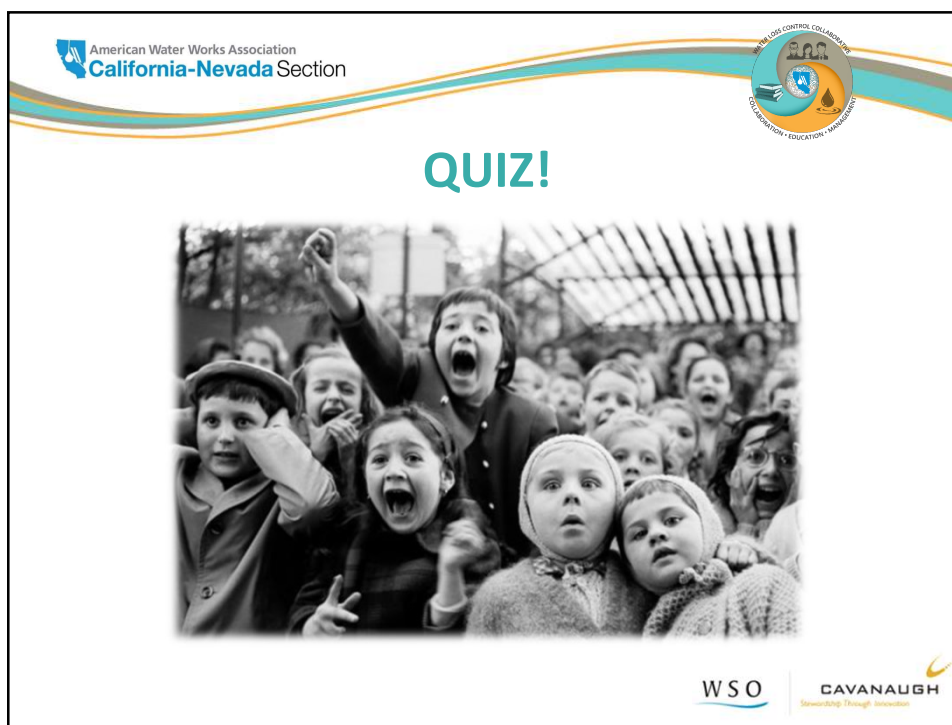
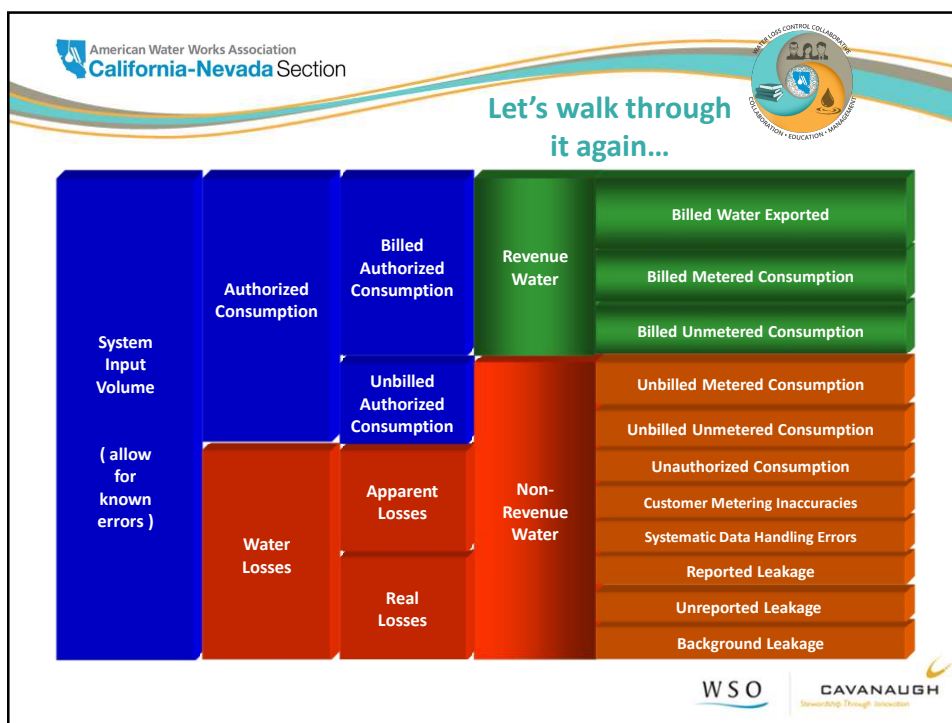


reducing Real Losses *creates an additional resource*

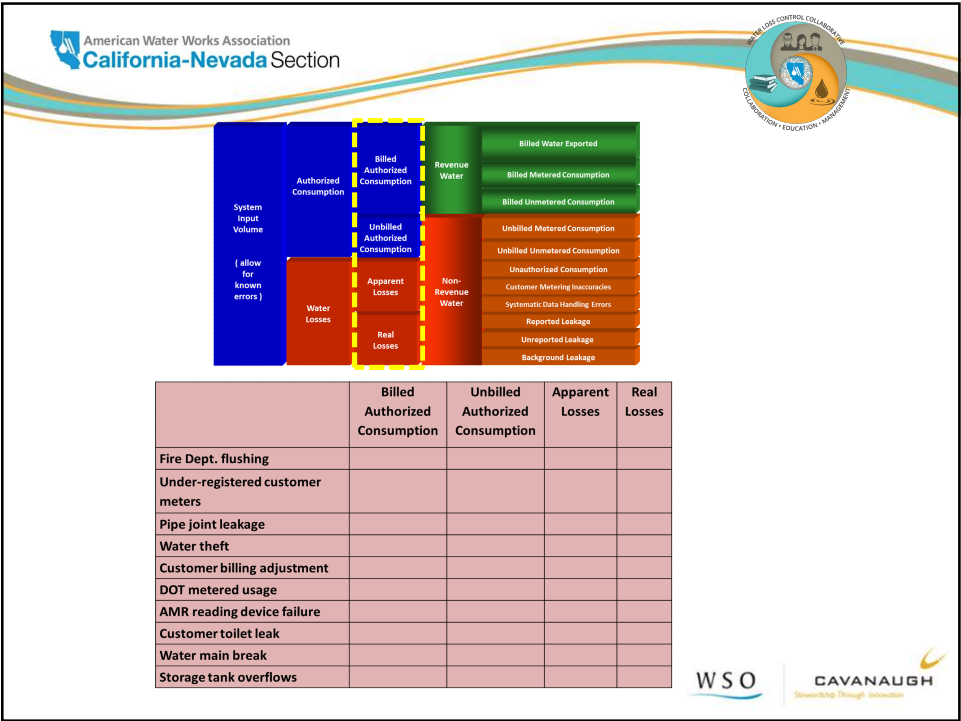
- can reduce operating costs
- can defer capital expenditure

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# California Water Loss Control Collaborative – Water Loss Technical Assistance Program



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# AWWA Free Water Audit Software

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## AWWA Free Water Audit Software

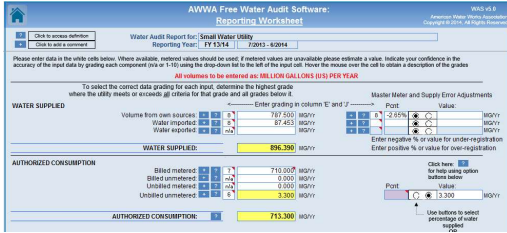
A value to be entered by the user



A calculated value based on data from other cells


Contains a recommended default value


**Functions of the AWWA Software:**

- *Complete a water balance*
- *Document data validity grades*
- *Calculate performance indicators*
- *Identify areas for improvement*







## AWWA Free Water Audit Software

### Sheets that require data entry:

Instructions

Reporting Worksheet

Performance Indicators

Comments

Water Balance

Dashboard

Grading Matrix

Service Connection Diagram



Definitions


Loss Control Planning

Example Audits

Acknowledgements

**the rest are references, results, and diagrams**










## AWWA Free Water Audit Software

Start with your name!

Name of Contact Person:	Barrie Fuzzy		
Email Address:	barrie.fuzzy@koala.ca.gov		
Telephone (incl Ext.):	714-690-3313		
Name of City / Utility:	Koala Water District		
City/Town/Municipality:	Eucalyptus		
State / Province:	California (CA)		
Country:	USA		
Year:	2015	Calendar Year	
Audit Preparation Date:	4/25/2016		
Volume Reporting Units:	Acre-feet		



## AWWA Free Water Audit Software

for each input into the audit software...



	COMMENTS	DEFINITIONS			
Volume from own sources:	+	?	3	1,464.676	acre-ft/yr
Water imported:	+	?	7	283.570	acre-ft/yr
Water exported:	+	?			acre-ft/yr
<b>WATER SUPPLIED:</b>				<b>1,748.246</b>	acre-ft/yr


DATA


VALIDITY

GRADES

VOLUMES







## Data Validity Grades


- qualitative but specific
- 1 through 10
- capture utility practices


Enter grading in column 'E' and 'F' →

	E	F	
Volume from own sources: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	n/a (not applicable). Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own).
Water imported: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	1. Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.
Water exported: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	2. 25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.
<b>WATER SUPPLIED:</b>			
Billed metered: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	3. Conditions between 2 and 4
Billed unmetered: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	4. 50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.
Unbilled metered: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	5. Conditions between 4 and 6
Unbilled unmetered: <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>	1	2	6. At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.
<b>HORIZONTAL CONSUMPTION:</b> <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/> <input type="button" value="5"/> <input type="button" value="6"/> <input type="button" value="7"/> <input type="button" value="8"/> <input type="button" value="9"/> <input type="button" value="10"/>			
7. Conditions between 6 and 8			
8. 100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy.			
9. Conditions between 8 and 10			
10. 100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.			












## Filling out the Software


1. **Gather** data and supporting documents
2. **Review** data for each input:
 

complete? consistent? accurate?
3. **Enter** the input.
4. **Comment** on source of data, quality of data, etc.
5. **Select** a data validity grade for each input













## Volumetric Inputs → Water Balance

Own Sources (Adjusted for known errors)  43,832.197	Water Exported 4,299.276	Authorized Consumption  86,000.133	Billed Authorized Consumption  85,937.499	Billed Water Exported Billed Metered Consumption (water exported is removed) 85,937.499	Revenue Water  85,937.499	
				Billed Unmetered Consumption 0.000		
	Water Supplied  93,046.662		Unbilled Authorized Consumption  62.634	Unbilled Metered Consumption 29.185	Non-Revenue Water (NRW)  7,109.163	
				Unbilled Unmetered Consumption 33.449		
			Apparent Losses 712.984	Unauthorized Consumption 232.617		
				Customer Metering Inaccuracies 480.367		
	Water Imported  53,513.741		Water Losses 7,046.529	Real Losses 6,333.546		Systematic Data Handling Errors 0.000
						Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>
						Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>
						Leakage on Service Connections <i>Not broken down</i>










## System Data


*Infrastructure information*

- Length of Mains (includes hydrants laterals)
- Count of service connections (active and inactive)

*Operating Pressure*

*used to calculate a technical minimum volume of leakage*







## Cost Data

### Total Annual Operating Cost

*How much are Apparent Losses worth?*

### Customer Retail Unit Cost



*How much are Real Losses worth?*

### Variable Production Cost



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## Performance Indicators

Water Audit Report for: **Small Water Utility**

Reporting Year: **FY 13/14** | **7/2013 - 6/2014**

\*\*\* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 64 out of 100 \*\*\*

**System Attributes:**

Apparent Losses: 17.399 MG/Yr

+

Real Losses: 165.691 MG/Yr

=

**Water Losses: 183.090 MG/Yr**

Unavoidable Annual Real Losses (UARL): 30.13 MG/Yr

Annual cost of Apparent Losses: \$96,214

Annual cost of Real Losses: **\$204,214**

Valued at **Variable Production Cost**  
Return to Reporting Worksheet to change this assumption

**Performance Indicators:**

Financial:

Non-revenue water as percent by volume of Water Supplied: 20.8%

Non-revenue water as percent by cost of operating system: 26.9%

Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: 8.80 gallons/connection/day

Real Losses per service connection per day: **83.80 gallons/connection/day**

Real Losses per length of main per day\*: N/A

Real Losses per service connection per day per psi pressure: 1.16 gallons/connection/day/psi

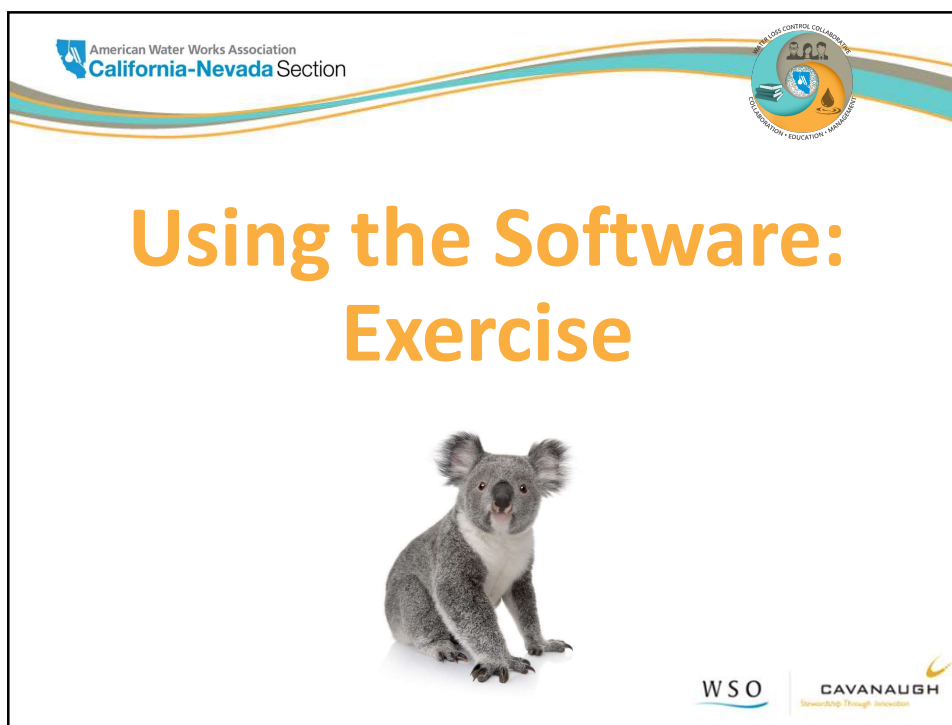
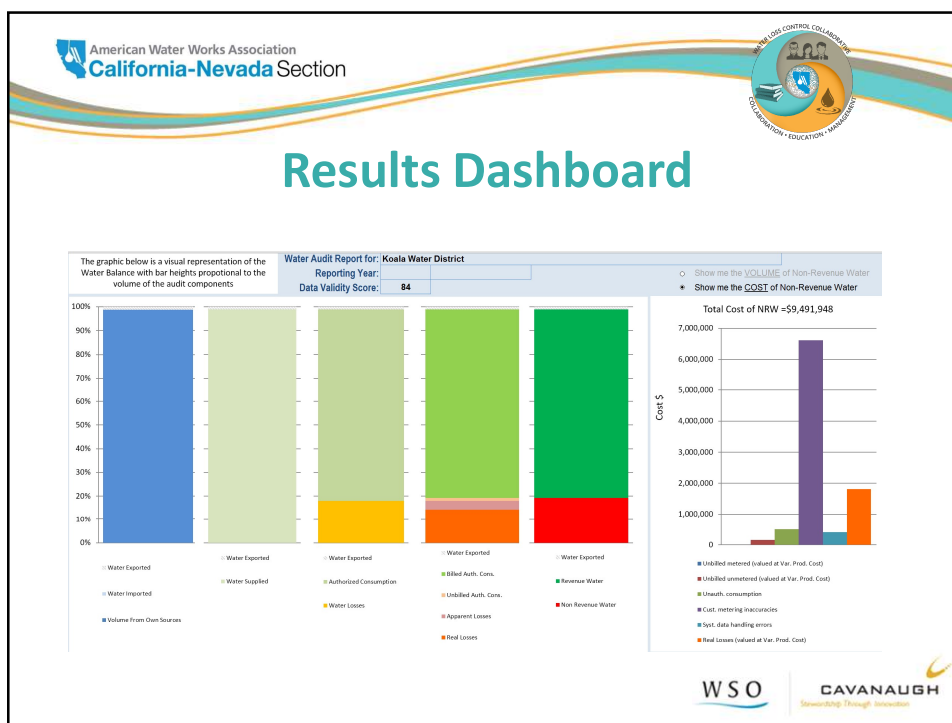
From Above, Real Losses = Current Annual Real Losses (CARL): 165.69 million gallons/year

Infrastructure Leakage Index (ILI) [CARL/UARL]: **5.50**

\* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

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# Data Validity Grading



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American Water Works Association  
**California-Nevada** Section

WATER LOSS CONTROL COLLABORATIVE  
COLLABORATION • EDUCATION • MANAGEMENT

## Data quality matters!


inaccuracy & uncertainty in inputs → inaccuracy & uncertainty in results


**Sources of error:**

- Instruments
- Databases
- People
- Missing information

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## Data Validity Grades

- qualitative but specific
- assess best practice implementation
- 1 through 10

must meet *all* criteria  
(and all criteria for lower scores)  
to select a given score


Enter grading in column 'E' and 'I' ----->      Dest.      Value:


Volume from own sources: + ? 6	n/a (not applicable). Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	<p><b>1.</b> Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.</p> <p><b>2.</b> 25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.</p> <p><b>3.</b> Conditions between 2 and 4</p> <p><b>4.</b> 50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.</p> <p><b>5.</b> Conditions between 4 and 6</p> <p><b>6.</b> At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.</p> <p><b>7.</b> Conditions between 6 and 8</p> <p><b>8.</b> 100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy</p> <p><b>9.</b> Conditions between 8 and 10</p> <p><b>10.</b> 100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.</p>
Water imported: + ? 7		
Water exported: + ? n/a		


**WATER SUPPLIED:**


Billed metered: + ? 7
Billed unmetered: + ? n/a
Unbilled metered: + ? n/a
Unbilled unmetered: + ? 6

**HORIZONTAL CONSUMPTION:** ?









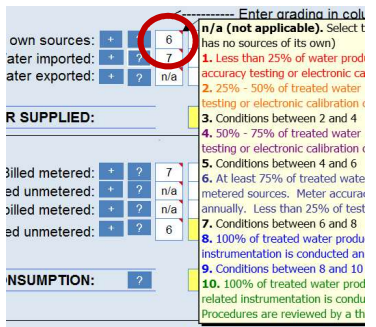
## How do I find the grading criteria?

**1**

hover over data validity score box to reveal comment box


**2**


select "Grading Matrix Tab"



**AWWA Free Water Audit Software: Grading Matrix**

3	4	5	6
<b>WATER SUPPLIED</b>			
<p>Conditions between 2 and 4</p>	<p>50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.</p>	<p>Conditions between 4 and 6</p>	<p>At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside +/- 6% accuracy.</p>
<p>Repairs and in the existing meters, the production active meters.</p>	<p>To qualify for 6: Formalize annual meter accuracy testing for all source meters, specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/selective meters.</p>		<p>To qualify for 10: Conduct annual meter accuracy testing and electronic calibration of related instrumentation on all meter bases. Complete project to install missing meters so that entire production is metered. Repair or replace meter accuracy.</p>
<p>Conditions between 2 and 4</p>	<p>Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include</p>	<p>Conditions between 4 and 6</p>	<p>Hourly production meter data is logged automatically &amp; reviewed on at least weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected and/or error confirmed by meter accuracy testing</p>



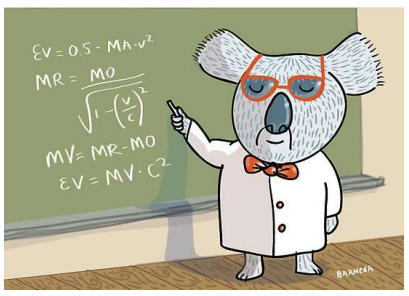




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# Data Validity Scoring Exercise





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# Documenting the Basis of Your Audit



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## Documentation



1. Get all your data in one place.
2. Show your work on analysis, correction, summarizing, and data validity grading!
3. Use the Comments Sheet.











## Documentation

Data Inputs	Data Validity Grades
<ul style="list-style-type: none"><li>• Data source</li><li>• Derivation (if calculated)</li><li>• Assumptions</li><li>• Action needed</li><li>• Questions</li></ul>	<ul style="list-style-type: none"><li>• Basis for grade selection</li><li>• Basis for not choosing the next higher grade</li><li>• Assumptions</li><li>• Action needed</li><li>• Questions</li></ul>






# Preparation for Wave 2 Work Session



## Wave 2 Prep

WAVE 1	WAVE 2	WAVE 3	WAVE 4
in-person work session	teleconference work session	in-person work session	validation session







*TAP team will coordinate with your Audit Team's point person to schedule a conference call; Full Audit Team to attend call*

what to prepare:

1. Water Audit (AWWA Water Audit Software v5.0)
2. Supporting Documentation
3. Questions on Methodology, Inputs, Results

**CY 2015  
FY 14-15**







## Supporting Documentation



### General

- Your most recent water audit (excel)
- Any previous water audits (AWWA format ideal for compilation)
- Documentation from water loss control efforts to date
- Any other data from your UWMP submittal that you think would be helpful

### Water Supplied

- Supply meter demographics (age, size, type)
- Monthly water supplied volume by supply meter (finished)
- Documentation from supply meter testing and/or calibration
- Schematic of the system showing locations of production meters, and import/export meters





## Supporting Documentation

### Authorized Consumption



- Monthly water sold volume by rate code
- Tracking sheets for unbilled and/or unmetered usage (fire, flushing, etc)



### Apparent Loss

- Customer meter demographics
- Customer meter test data

### System Data

- Miles of main & # connections per pressure zone
- Available pressure data









## Supporting Documentation

### Cost Data


- Budget Documents from audit year (itemized)
  - Total operating cost (water)
  - Debt service schedule
  - Water purchases
  - Chemical purchases
  - Power costs for pumping
  - WTP sludge handling costs
  - Depreciation schedule
- Rate code key







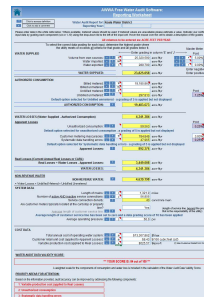
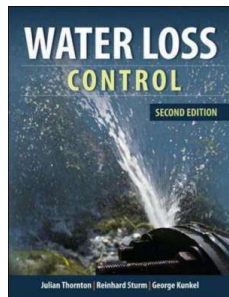
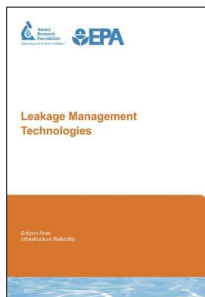
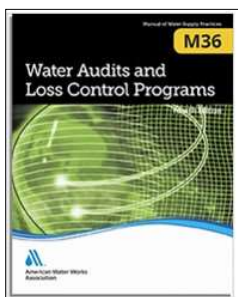
## Scheduling Your Session

- Teleconference will be scheduled for between **October to February**
- We will work through your primary point of contact to schedule it
- Primary contact will need to coordinate the time that works for your team members





## Some light reading...





**AWWA M36**



**Water Research Foundation Reports**

2811: Evaluating Water Loss and Planning Loss Reduction Strategies  
2928: Leakage Management Technologies  
4372: Water Audits and Real Loss Component Analysis

**textbooks**

**AWWA WLCC Free Water Audit Software ©**  
current version: 5.0





# Thank You!

[www.californiawaterloss.org](http://www.californiawaterloss.org)

