

An Introduction to Strategic Water Loss Reduction

Webinar 2: Strategies to Address Real Water Losses



When you know better you do better

Maya Angelou

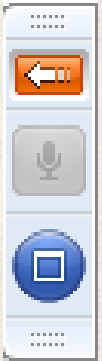
Logistics

At the top right corner of your screen:

Show your control panel to submit questions and see answers

All phones/microphones are muted for the duration of the webinar.

Toggle between full screen/window screen view



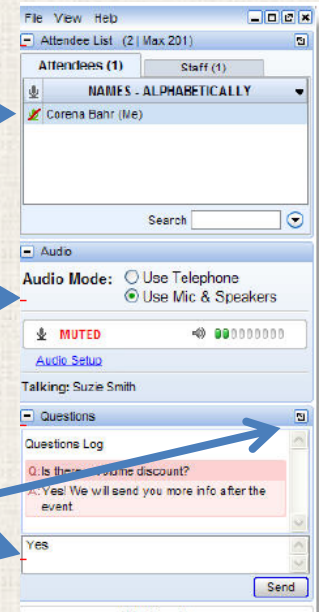
Control Panel:

Attendee List

Audio: please choose between speakers and telephone.

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Submit questions in the Questions box at any time, and press [Send]. To undock and increase the size of the box, click on top right corner icon.

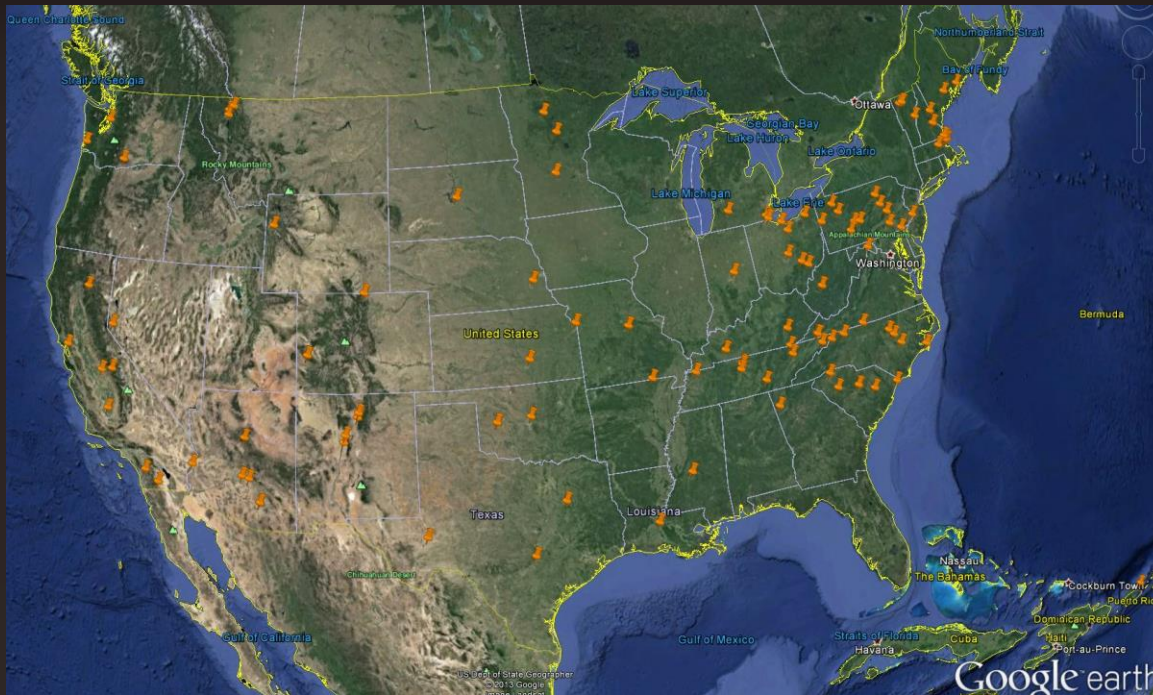


WELCOME TO THE EFCN WEBINAR SERIES



AN INTRODUCTION TO STRATEGIES TO ADDRESS REAL WATER LOSSES

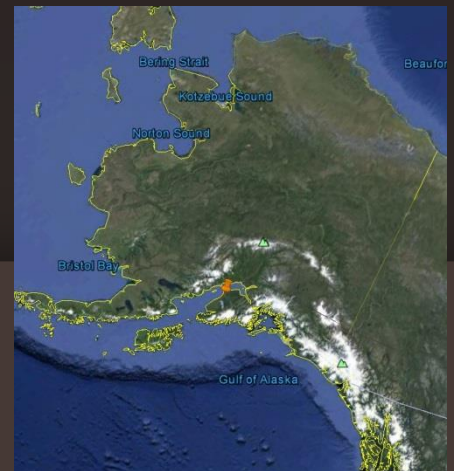
GEOGRAPHICAL DISTRIBUTION OF TODAY'S ATTENDEES



Mainland US & Puerto Rico



Hawaii



Alaska

TIME FOR A QUICK REVIEW



The diagram illustrates a water balance equation. It consists of three circles arranged horizontally. The first circle on the left is red and contains the text 'Water Produced'. To its right is a red minus sign. The second circle in the middle is green and contains the text 'Water Sold'. To its right is a green equals sign. The third circle on the right is purple and contains the text 'Water Loss'. All circles have a thin white border.

**Water
Produced**

**Water
Sold**

**Water
Loss**

“WATER LOSS” VALUE IS MORE THAN JUST WATER LEAKING FROM THE SYSTEM



Water Loss

THE VALUE REPRESENTS: NON-REVENUE WATER



Water Use for
City, Town, Muni
Purposes

Illegal Water
Use

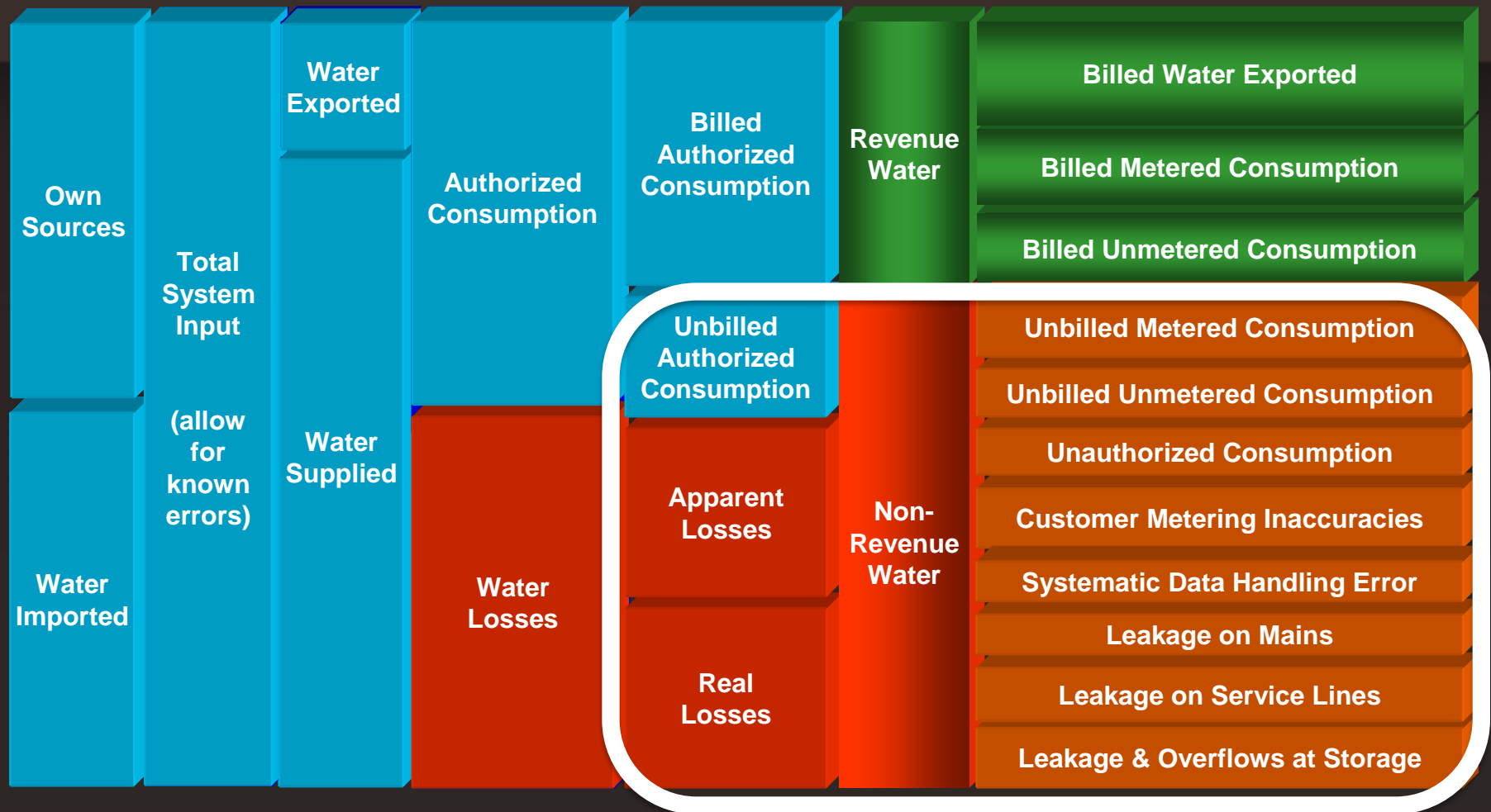
Water Use by
Water Utility for
flushing or other
purposes

Lost Water

Inaccurate
Meters

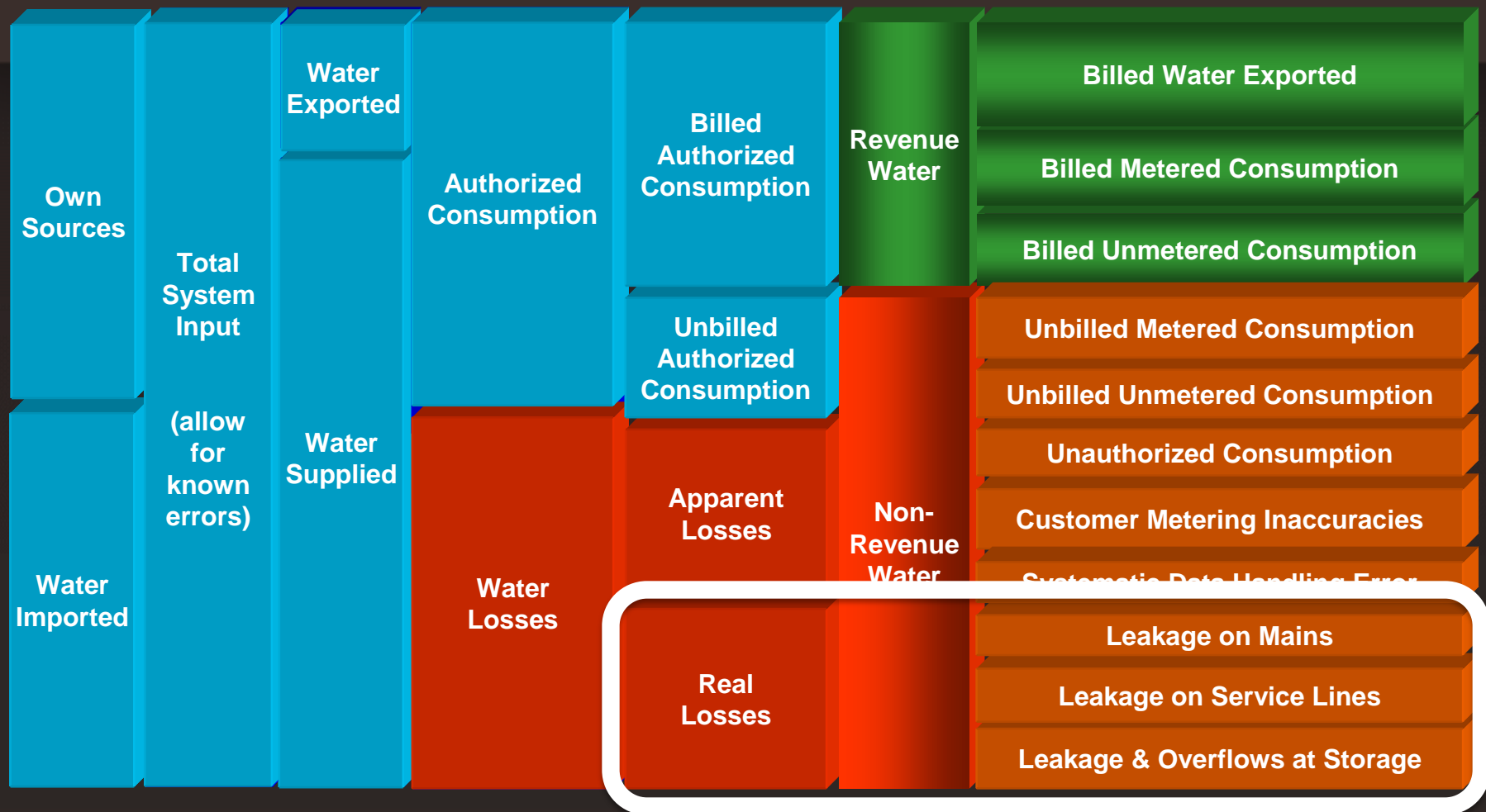
Poor Data
Handling

WANT TO ACCOUNT FOR OUR WATER



CATEGORIZING NON-REVENUE WATER

WANT TO ACCOUNT FOR OUR WATER



WEBINAR FOCUS: REAL WATER LOSSES

WHY DO WE CARE ABOUT REAL WATER LOSSES?

LIMITED WATER RESOURCES

**HAZARDS (ICE, PONDING,
HYRDOPLANING)**

**INCREASING COSTS OF PRODUCTION,
INCLUDING INCREASED ENERGY
COSTS**

WATER QUALITY IMPACTS

INCONVENIENCE TO CUSTOMERS

**DAMAGE TO PROPERTY OR OTHER
UTILITIES**

“REAL” WATER LOSSES



LEAKAGE
ON
MAINS

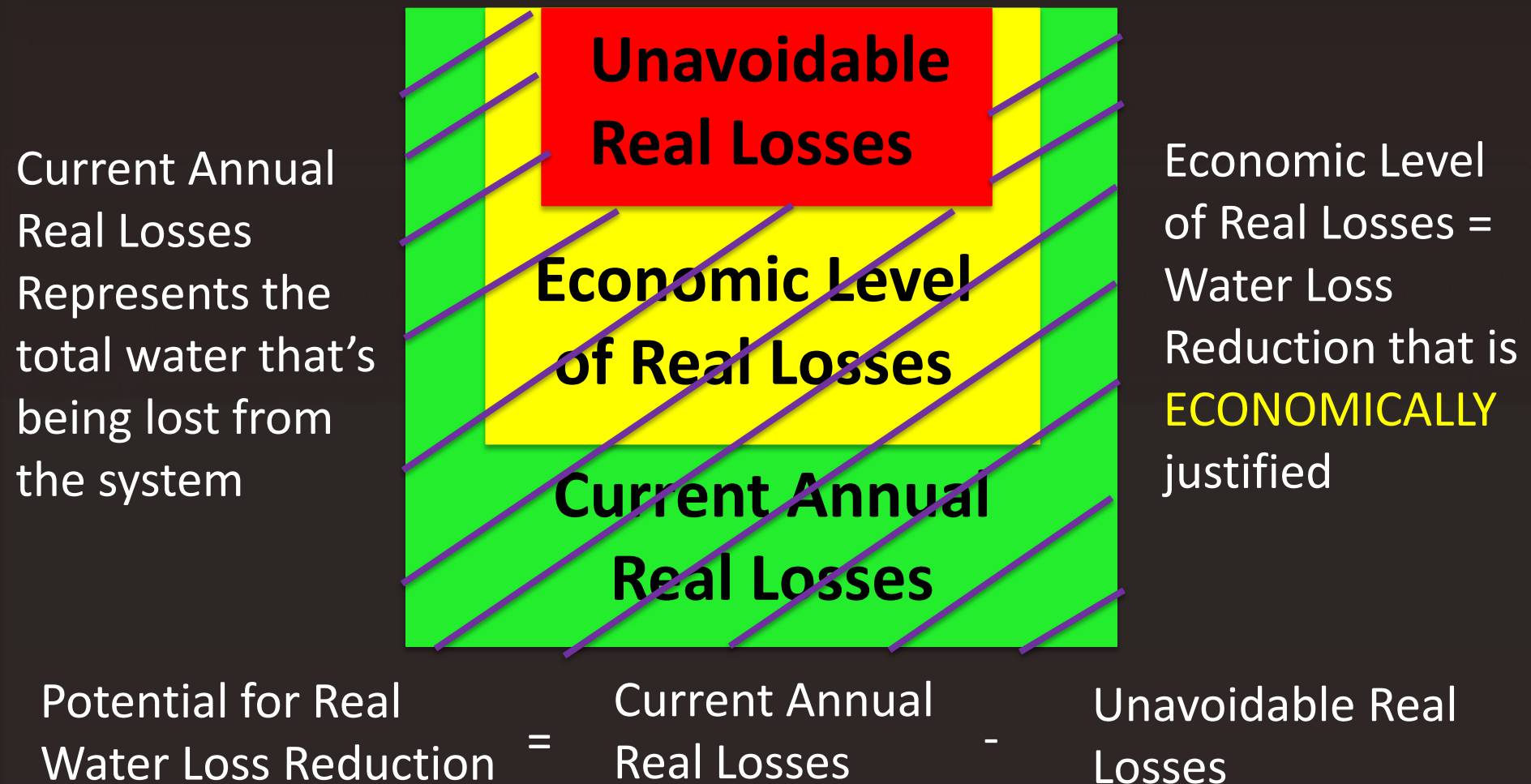


LEAKAGE
ON SERVICE
LINES



LEAKAGE OR
OVERFLOW AT
STORAGE
TANKS

CATEGORIES OF WATER LOSS

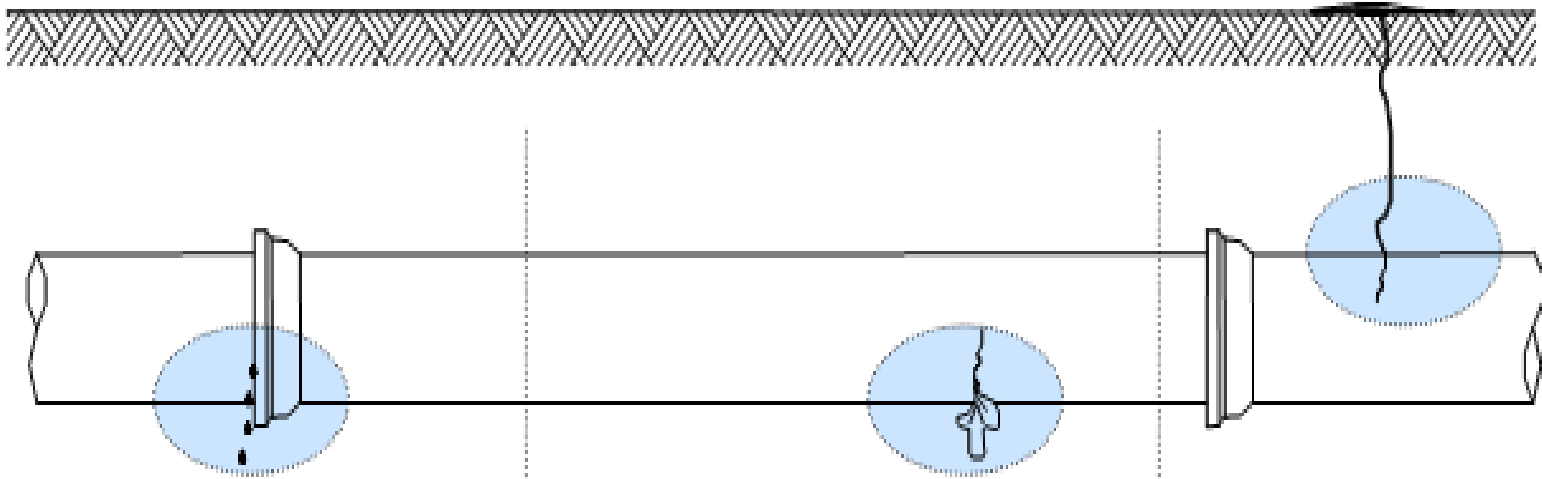


CATEGORIES OF WATER LOSS

Unavoidable

Detectable

Observable



Background Leakage

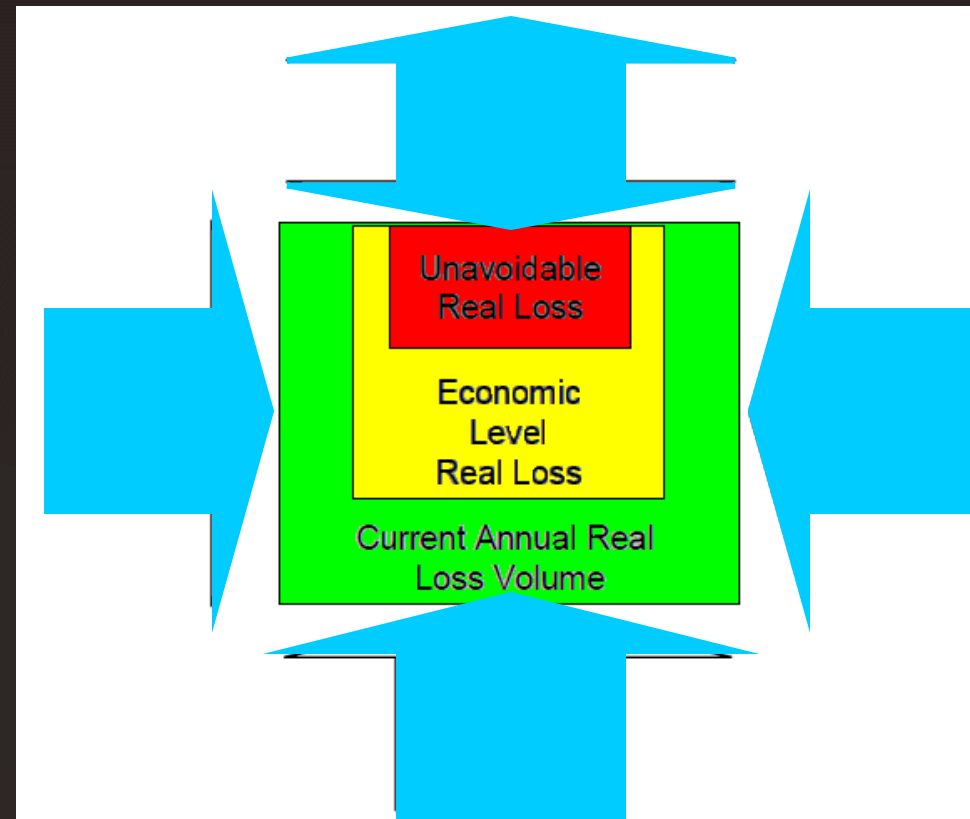
Unreported Leaks

Reported Breaks

Addressing Real Losses

Ways to reduce losses

1. Respond faster to known leaks
2. Asset Management
3. Reduce pressure
4. Find hidden leaks



1. RESPOND FASTER TO KNOWN LEAKS



LEAKS

Which causes
more water
loss?



LEAK QUANTITIES

Leak Rate in GPM	Length of Leak	Total Gallons
500 gpm	4 hours	120,000
200 gpm	2 days	576,000
50 gpm	4 days	288,000
10 gpm	45 days	648,000
5 gpm	100 days	720,000

CUTTING LEAK TIME IN HALF

Leak Rate in GPM	Length of Leak	Total Gallons
500 gpm	1 day	1,200,000
200 gpm	1 day	480,000
100 gpm	1 day	240,000
50 gpm	1 day	120,000
20 gpm	1 day	48,000
10 gpm	1 day	24,000
5 gpm	1 day	12,000
500 gpm	50 days	324,000
5 gpm	50 days	360,000

Responding twice as fast to breaks would save 1,176,000 gallons

LEAKS



What are reasons you haven't repaired leaks sooner?

THE CASE FOR MORE RAPID RESPONSE

Small leaks add up to lots of water

System integrity is compromised

Less expensive to repair than to replace

Over the long run, equip & training will pay off

Avoid more serious & expensive repair later

COLLECT DATA TO HELP MAKE YOUR CASE

FULL COST
OF WATER
PRODUCTION

ESTIMATE OF
WATER LOST
THROUGH
DELAYS IN
FIXING LEAKS

VALUE OF
NON-
ECONOMIC
BENEFITS

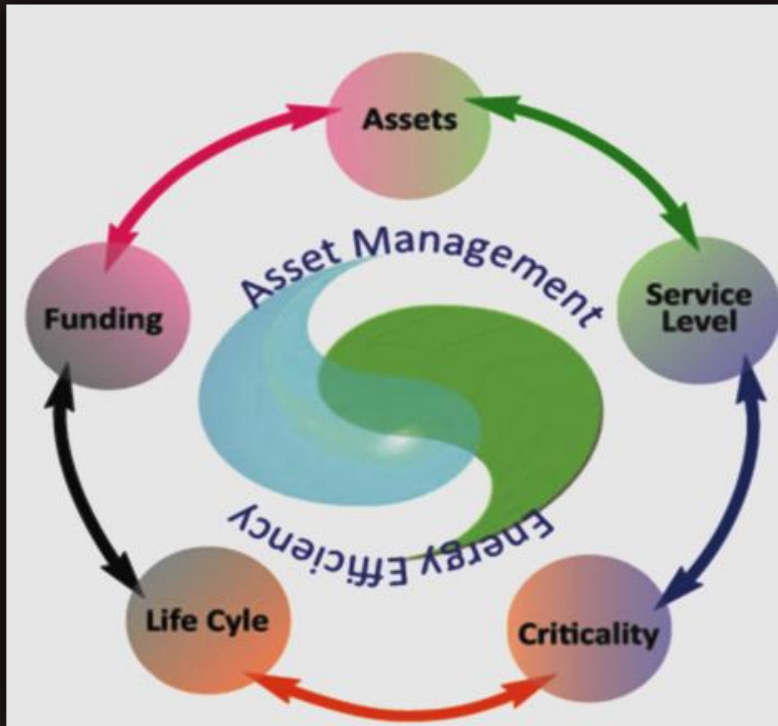
COST OF
ADDITIONAL
EQUIPMENT
OR SUPPLIES

COST OF
ADDITIONAL
STAFF

2. ASSET MANAGEMENT



A QUICK REVIEW OF ASSET MANAGEMENT



AM TIES TO WATER LOSS

STRATEGIC
SELECTION OF
PIPE FOR
REPLACEMENT

DATA
DRIVEN
DECISIONS

MORE
STRATEGIC
DEPLOYMENT
OF LEAK
DETECTION
STRATEGIES

EXAMINE POTENTIAL TO
REDUCE OR ELIMINATE
NEED FOR ADDITIONAL
RESOURCES - WELLS &
TREATMENT

ASSET MANAGEMENT

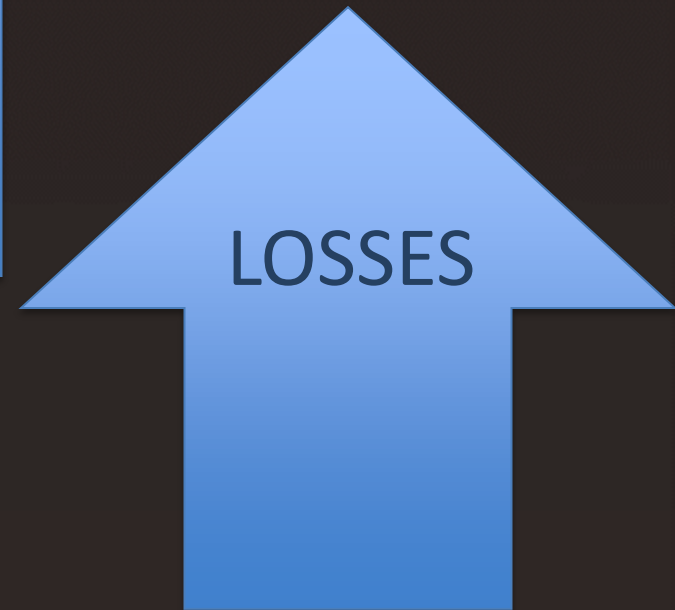
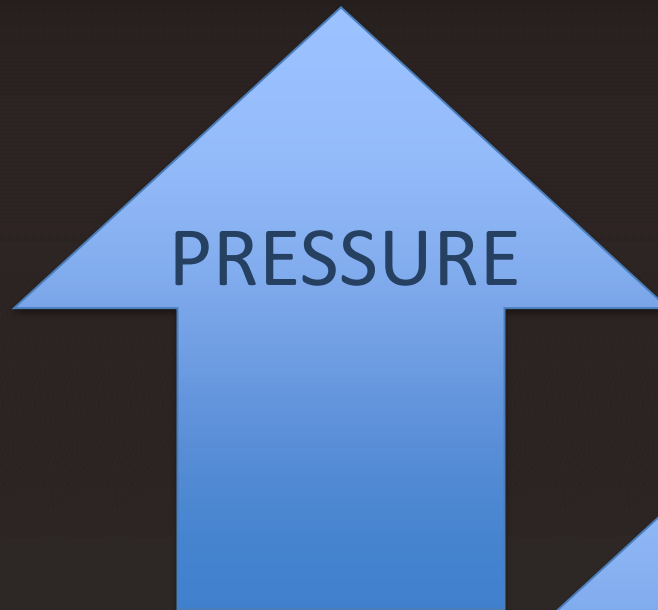
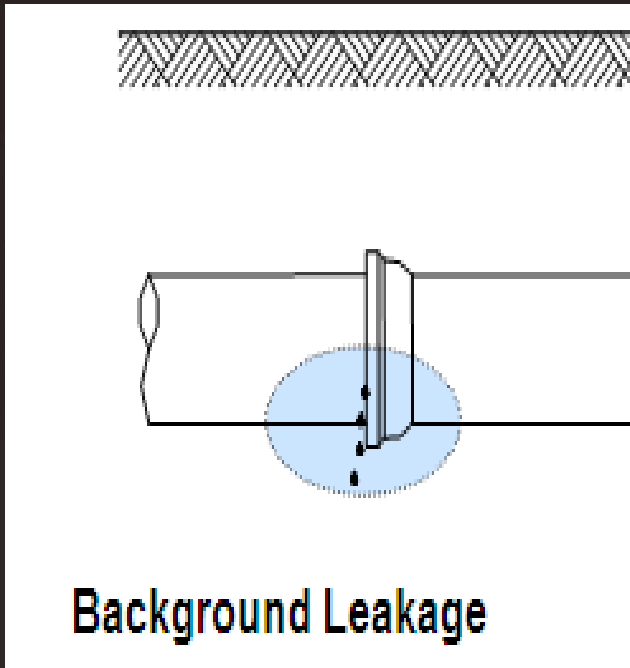
Are you
practicing asset
management?



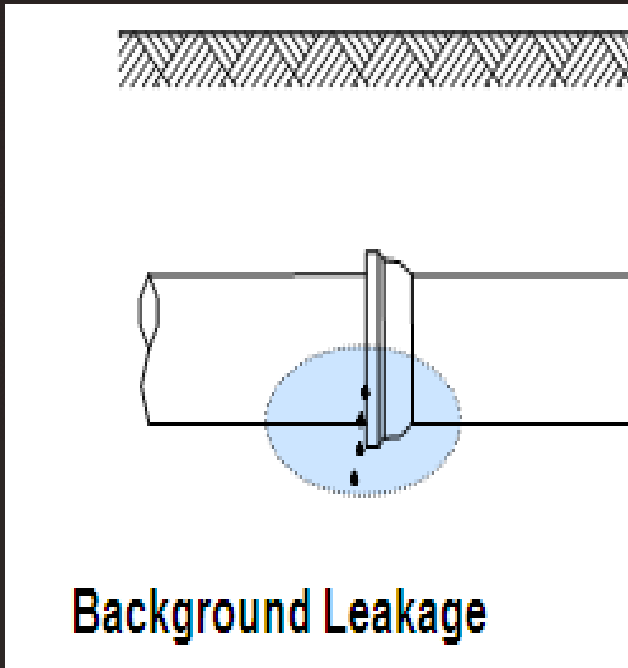
3. REDUCE PRESSURE



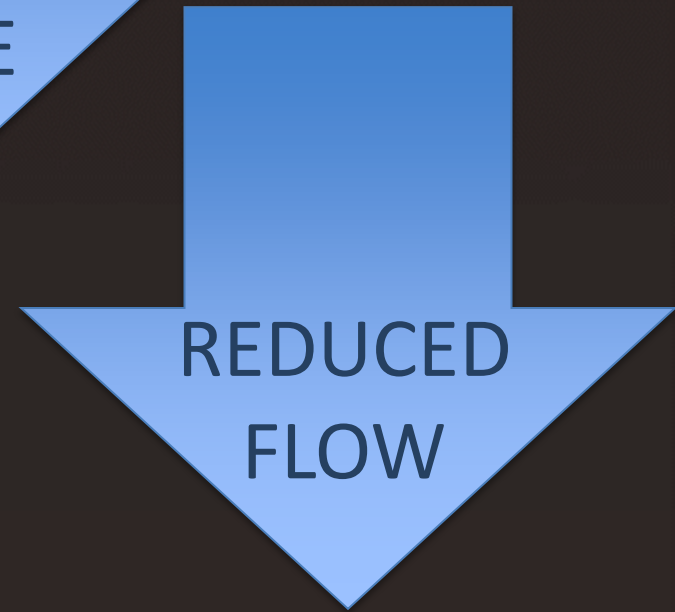
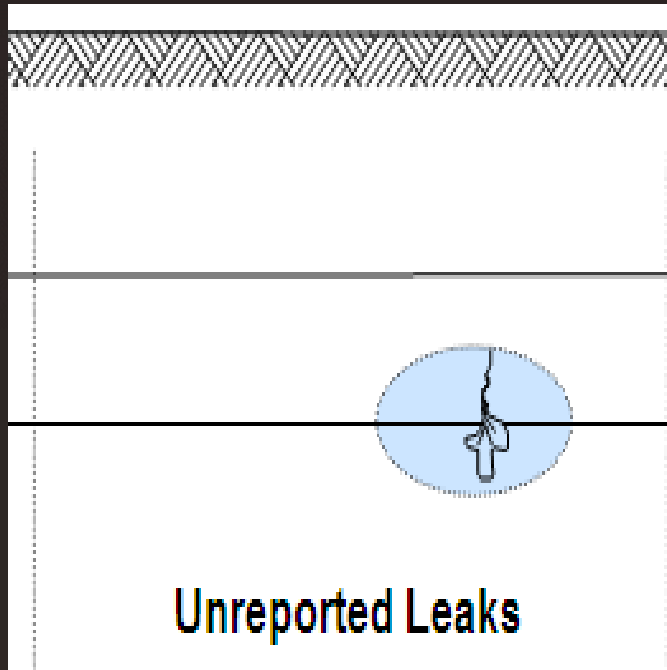
PRESSURE AFFECTS UNAVOIDABLE LOSSES



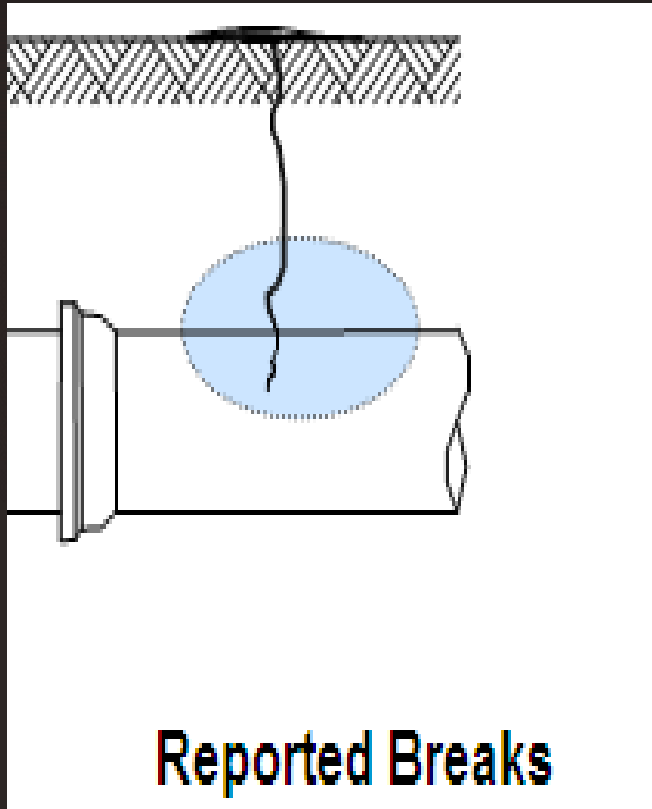
PRESSURE AFFECTS UNAVOIDABLE LOSSES



SIMILAR AFFECT ON HIDDEN LEAKS



CAN REDUCE THE NUMBER & FREQUENCY OF BREAKS



PRESSURE

FEWER
BREAKS

PRESSURE MANAGEMENT

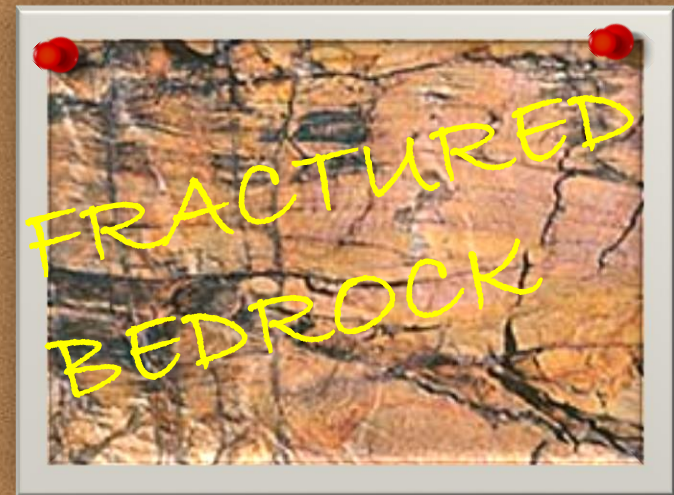
Do you do
anything like
this?



4. FIND HIDDEN LEAKS



HIDDEN LEAKS



HIDDEN LEAKS

Find hidden leaks by proactively looking for them



WHY LOOK?

- a) Reduce water loss
- b) Prevent catastrophic failure
- c) Increase system integrity
- d) Increase life of assets
- e) Reduce overall cost of managing assets



LOOKING FOR LEAKS

Active Listening

Passive Listening



BOTH TYPES ARE BASED ON LEAK NOISE

Small
leaks higher
frequency
than large

Leaks on
metal pipe
louder than
plastic pipe

Transitions
in pipe
material &
fittings
muffle noise

Smaller
leaks louder
than larger
leaks

CONCERNS WITH LEAK NOISE

CONTINUOUS
USAGE
GENERATES
SIMILAR
NOISE

NEED
ACCESS
POINTS TO
HEAR
NOISE

TRAFFIC
NOISE
INTERFERES

ELECTRIC
EQUIPMENT
NOISE CAN
INTERFERE

ACTIVE LEAK DETECTION

Highly skilled staff or contractor

Time and Labor intensive



Photo courtesy Texas Water Board



PASSIVE LEAK DETECTION



Staff to
follow up
with
potential
leaks



Cost of
Equipment



CONSIDERATIONS

Active Listening
Or
Passive Listening?

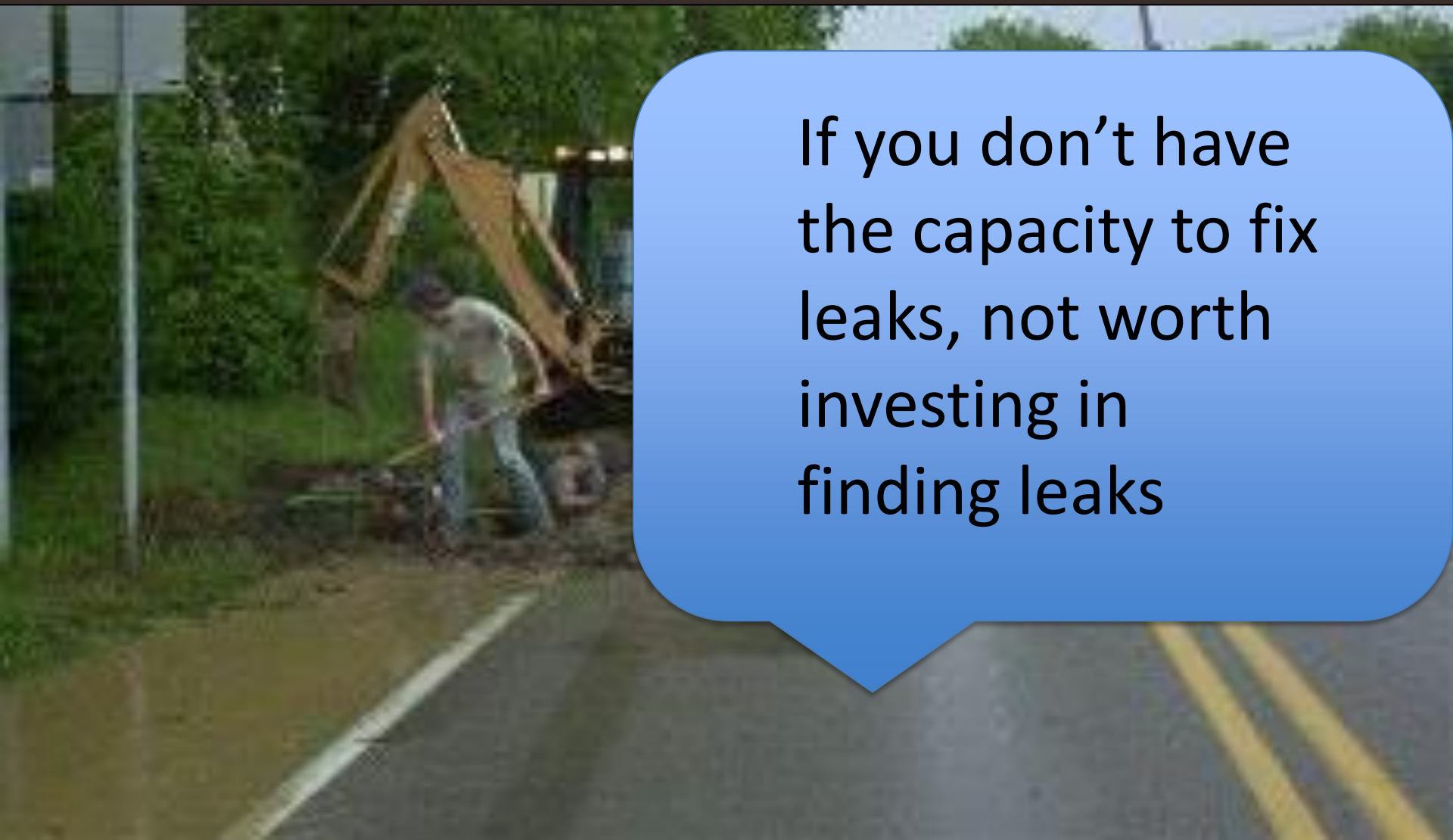


LEAK DETECTION

What is your experience?



WATER IS ONLY SAVED THROUGH FIXING LEAKS NOT FINDING THEM

A photograph of a construction worker in a grey shirt and blue jeans using a shovel to dig in a trench. In the background, a yellow excavator is visible. The scene is outdoors on a paved road with a white line, next to a grassy area and trees. A blue speech bubble is overlaid on the right side of the image.

If you don't have
the capacity to fix
leaks, not worth
investing in
finding leaks

Where is this
leak located?

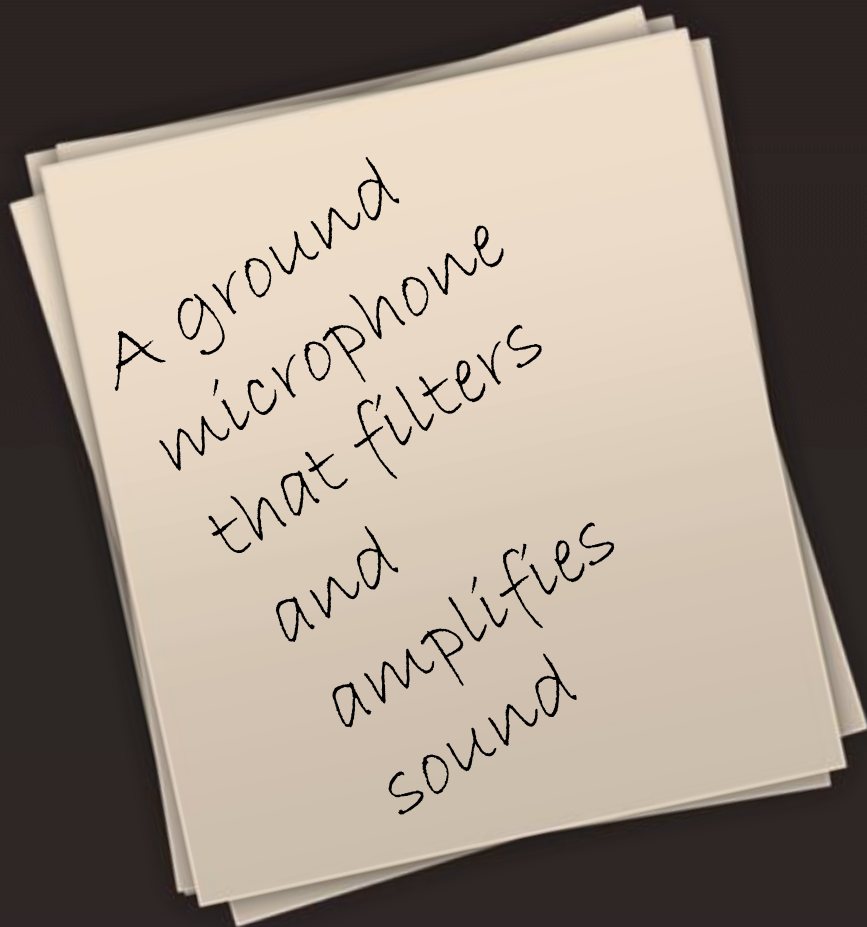


PINPOINT LEAKS (BOTH OBERSERVABLE & HIDDEN)

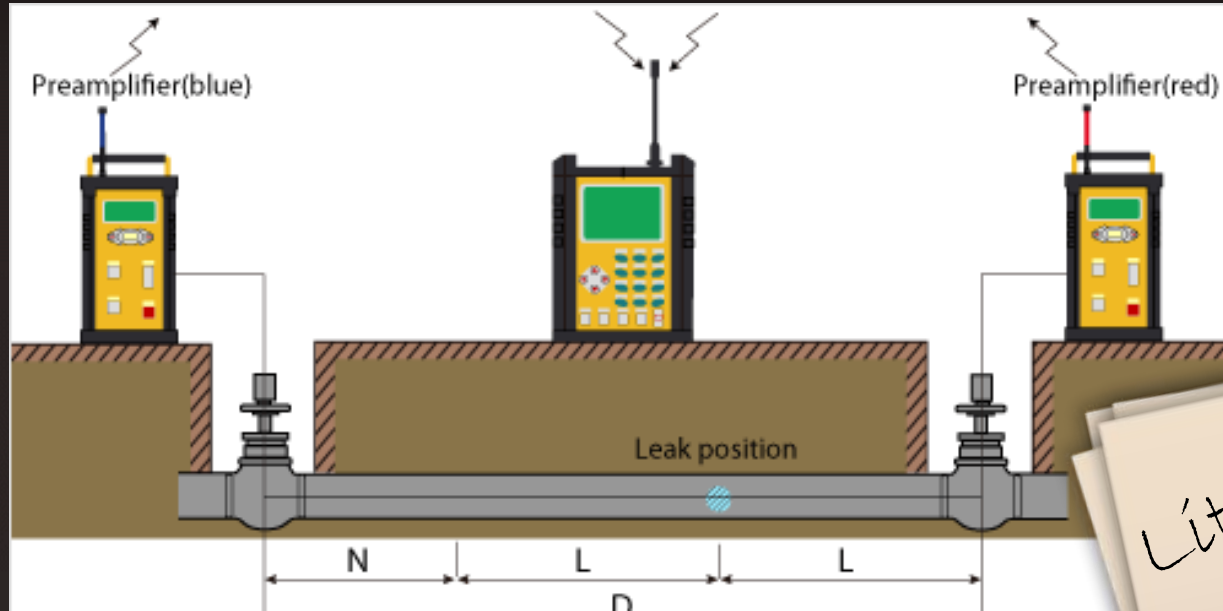
WHY?
Saves money
& saves time
Reduces
excavation



GETTING STARTED: TOOLS YOU CAN USE

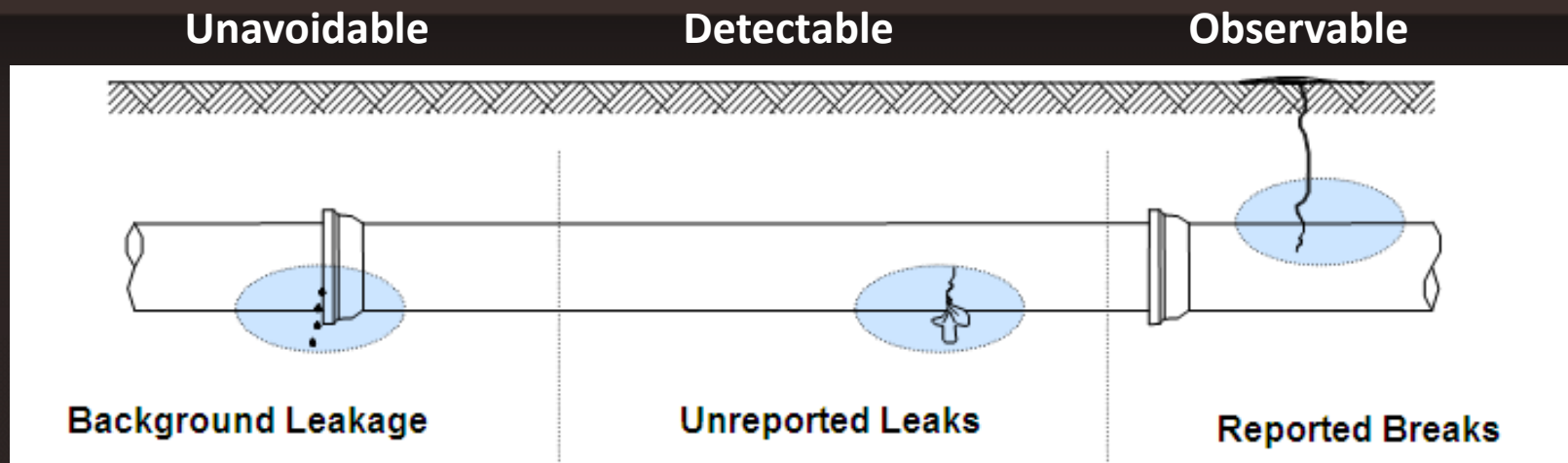


A LITTLE MORE SOPHISTICATED: LEAK CORRELATOR



Little more
expensive &
training
required,
but can pay
for itself

MATCH APPROACHES TO TYPE OF LOSS



Approaches

- Pressure reduction
- Nighttime pressure reduction
- Reduce number of joints and fittings
- Main & service line replacements

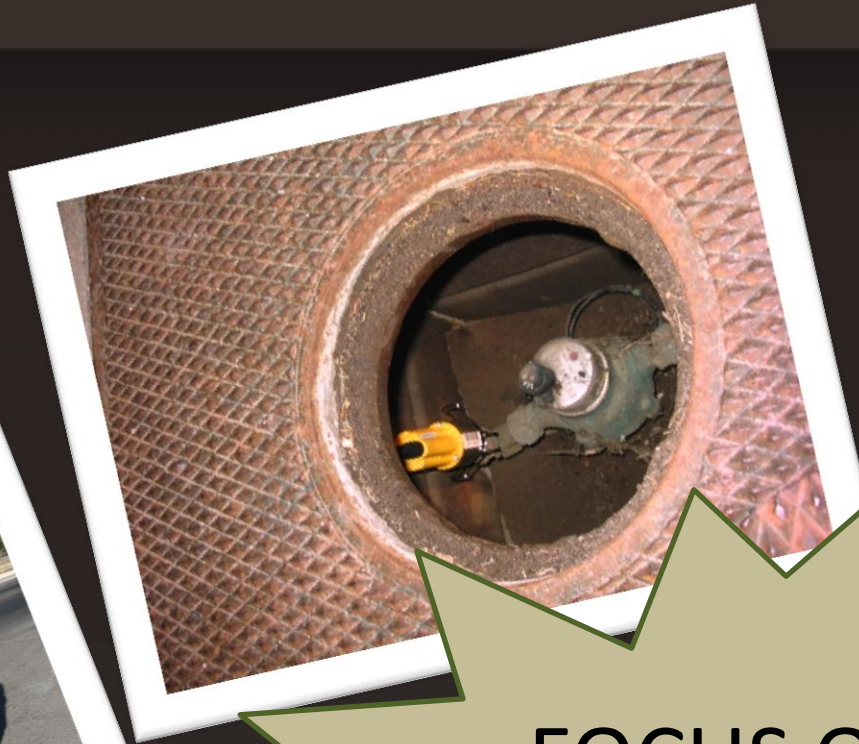
Approaches

- Pressure reduction
- Nighttime pressure reduction
- Proactive leak detection & repair
- Main & service line replacements

Approaches

- Pressure reduction
- Nighttime pressure reduction
- Improve speed of repair
- Main & service line replacements

STRATEGIC DEPLOYMENT



FOCUS OF
WEBINAR 3

TAKING IT TO YOUR FACILITY



**DEVELOP
YOUR
TEAM**

TAKING IT TO YOUR FACILITY

COMPLETE AWWA WATER AUDIT

AWWA Water Loss Control Committee (WLCC) Free Water Audit Software v4.2													
Copyright © 2010, American Water Works Association. All Rights Reserved.	WASv4.2												
<p>PURPOSE: This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.</p> <p>USE: The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons on the left below. Descriptions of each sheet are also given below.</p> <p>THE FOLLOWING KEY APPLIES THROUGHOUT:</p> <table><tr><td><input type="text"/></td><td>Value can be entered by user</td></tr><tr><td><input type="text"/></td><td>Value calculated based on input data</td></tr><tr><td><input type="text"/></td><td>These cells contain recommended default values</td></tr></table> <p>Please begin by providing the following information, then proceed through each sheet in the workbook:</p> <p>NAME OF CITY OR UTILITY: <input type="text"/> COUNTRY: <input type="text"/></p> <p>REPORTING YEAR: <input type="text"/> START DATE (MM/YYYY): <input type="text"/> END DATE (MM/YYYY): <input type="text"/></p> <p>NAME OF CONTACT PERSON: <input type="text"/> E-MAIL: <input type="text"/> TELEPHONE: <input type="text"/></p> <p>PLEASE SELECT PREFERRED REPORTING UNITS FOR WATER VOLUME <input type="text"/></p> <p>Click to advance to sheet... Click here: ? for help about units and conversions</p> <table><tr><td>Instructions</td><td>The current sheet</td></tr><tr><td>Reporting Worksheet</td><td>Enter the required data on this worksheet to calculate the water balance</td></tr><tr><td>Water Balance</td><td>The values entered in the Reporting Worksheet are used to populate the water balance</td></tr></table>		<input type="text"/>	Value can be entered by user	<input type="text"/>	Value calculated based on input data	<input type="text"/>	These cells contain recommended default values	Instructions	The current sheet	Reporting Worksheet	Enter the required data on this worksheet to calculate the water balance	Water Balance	The values entered in the Reporting Worksheet are used to populate the water balance
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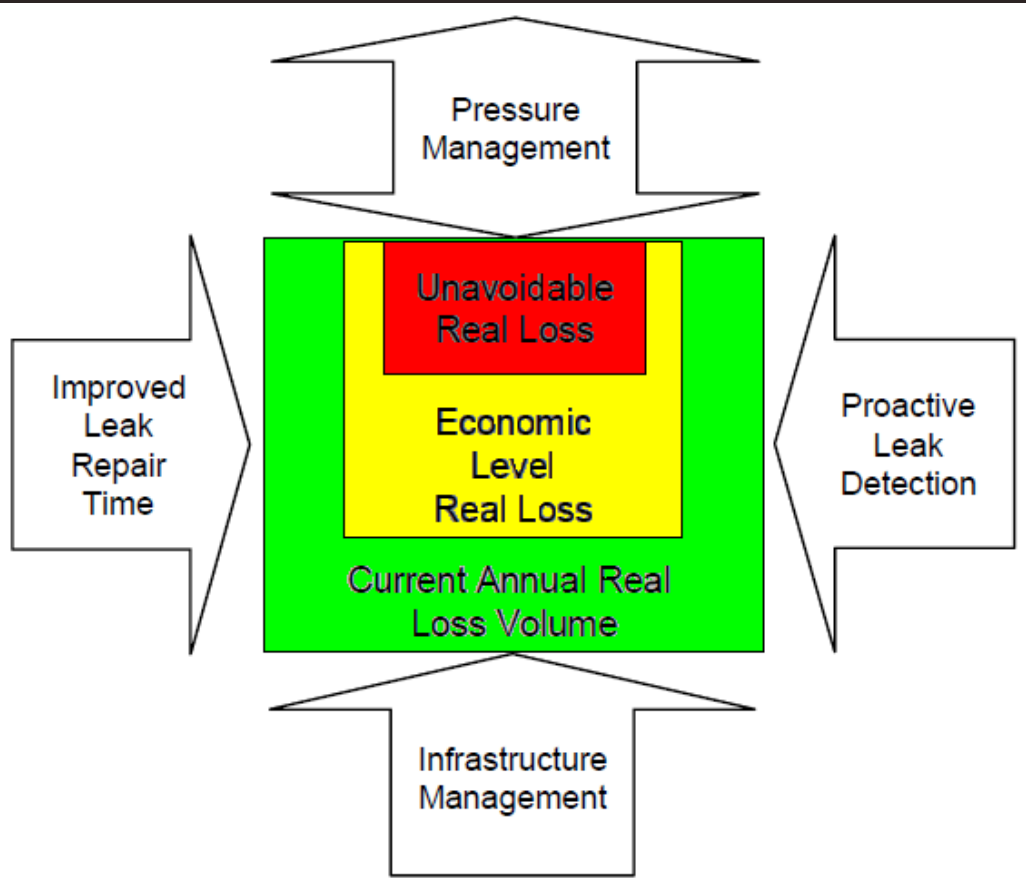
TAKING IT TO YOUR FACILITY

**DETERMINE HOW
LARGE OF A PROBLEM
DO YOU HAVE WITH
REAL WATER LOSS**



TAKING IT TO YOUR FACILITY

**EXAMINE EACH
OF THE FOUR
METHODS OF
REDUCING REAL
LOSS...**



TAKING IT TO YOUR FACILITY



**HOW QUICKLY DO
YOU REPAIR BREAKS
WHEN THEY ARE
IDENTIFIED? WHAT
CAN YOU DO TO
IMPROVE THE SPEED
OF REPAIR OF
KNOWN BREAKS?**

TAKING IT TO YOUR FACILITY



**DO YOU CURRENTLY
PRACTICE ASSET
MANAGEMENT?
HAVE YOU
CONSIDERED WAYS
IN WHICH TO BE
STRATEGIC WITH
PIPE REPLACEMENT?**

TAKING IT TO YOUR FACILITY



**WHAT PRESSURE DO
YOU OPERATE THE
SYSTEM? IS THERE
AN OPPORTUNITY
TO REDUCE THE
PRESSURE? ALL THE
TIME? AT NIGHT?**

TAKING IT TO YOUR FACILITY



DO YOU HAVE ANY INDICATIONS THAT YOU ARE LOSING A LOT OF WATER TO HIDDEN LEAKS? HOW BAD IS THE PROBLEM? COULD YOU FIX HIDDEN LEAKS IF THEY WERE FOUND?

TAKING IT TO YOUR FACILITY

An Introduction to Strategic Water Loss Reduction

Webinar 3: Strategically Applying Water Loss
Reduction Strategies



When you know better you do better

Maya Angelou

**TUNE INTO WEBINAR 3
TO LEARN MORE
ABOUT STRATEGICALLY
APPLYING REAL WATER
LOSS REDUCTION
STRATEGIES**

ASSISTANCE AVAILABLE

Would you be
interested in
assistance
with...



FOLLOW UP

We will contact attendees with:

- Answers to webinar questions**
- Access to resources for water loss**
- Other types of assistance requested**

UPCOMING WEBINARS

3/31/14 Water Loss Reduction – Part III

To register: efcnetwork.org/upcoming

**4/22 – 4/24 (Exact time to be determined) – “Ask the Expert”
Special Asset Management Webinar Opportunity**

One of the premier asset management professionals from New Zealand will be visiting the Southwest EFC and will answer questions from water systems



**WE WANT TO THANK EPA
FOR PROVIDING
FUNDING FOR THIS
PROJECT**



Smart Management for
Small Water Systems

CONTACT US

HEATHER HIMMELBERGER

heatherh@unm.edu

DAWN NALL

efcnall@gmail.com



**Southwest
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