Today’s Webcast

- Program overview & orientation – objectives, activities & schedule
- AWWA Water Balance terms and concepts
- Data needed & sources
- Next steps for data gathering
- Who and what to bring to the 10/14 Workshop
- Q&A

If you have questions, please feel free to type them in at any time. We will have a Q&A at the end of the webcast.

Utility Partners

- Kearns Improvement District
- Granger Hunter Improvement District
- City of Orem
Program Overview – What to expect

What you put in to the Program

- Today’s webcast
- Homework – gathering your data
- Workshop participation (October)
- Give feedback for future training & technical assistance needs
- Apply workshop learning at your utility
What you get out of the Program

- Training on AWWA water balance and audit software
- Training on data validation for the water audit
- Forging next steps in your Water Loss Control Program

Added Benefits for Attending the Workshop

- Connectivity with your peers – others who are working on the same thing you are
- Lunch!

Pilot Training Program Overview

- Kickoff Webcast - Pilot Group: Today
- Gather and provide data to us: 9/21/16
- Webcast to prep for 10/13 (Big Group): 9/22/16
- Big group training workshop: 10/13/16
- 1-on-1 Focus Group Session (Pilot Group): 10/14/16
- Post-Program Survey to participants: Nov 2016
- Program report: Dec 2016
Basic Concepts

1. Utilize the Water Balance.

2. Separate Total Water Loss into Real and Apparent Loss.

3. Separate Real and Apparent Loss into their subcomponents.

4. Use metrics in units of Volume, Value & Validity.

AWWA Water Balance

- **SYSTEM INPUT VOLUME**
- **AUTHORIZED CONSUMPTION**
- **AUTHORISATION CONSUMPTION**
- **UNAUTHORISED CONSUMPTION**
- **CUSTOMER METER INACCURACIES**
- **DATA HANDLING ERRORS**
- **REAL LOSSES**
- **APPARENT LOSSES**
- **NONREVENUE WATER**
- **OWN SOURCES**
- **SOLUTION**

- **Total Losses**
- **Water Auditing Foundations**
Non-Revenue Water

1. Water put into the system that does NOT return revenue to the Utility.

2. All Water Loss plus Unbilled Consumption.

3. "Unaccounted-for water" has been abandoned as an obsolete practice (2003).
In computer science, **data validation** is the process of ensuring that a program operates on clean, correct and useful data.

- AWWA developed a detailed grading matrix for Water Audit inputs
- Based on the utility's policies and practices for data collection, data management, data archiving, quality control procedures, and derivation of audit inputs
- Provides a quantitative measure of the reliability
## AWWA Free Water Audit Software© (V5.0)
### Guidance on Use of Water Audit Data, based on Level of Data Validity

<table>
<thead>
<tr>
<th>Functional Focus Area</th>
<th>Audit Data Collection</th>
<th>Short-term loss control</th>
<th>Long-term loss control</th>
<th>Target-setting</th>
<th>Benchmarking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level I (0-25)</td>
<td>Level II (26-50)</td>
<td>Level III (51-70)</td>
<td>Level IV (71-90)</td>
<td>Level V (91-100)</td>
</tr>
<tr>
<td>Data Validity Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level I</td>
<td>Audit data is not valid, cannot be used.</td>
<td>No recommendations.</td>
<td>No recommendations.</td>
<td>No recommendations.</td>
<td>No recommendations.</td>
</tr>
<tr>
<td>Level IV</td>
<td>Audit data is very valid, with no major issues.</td>
<td>Recommendations for short-term and long-term loss control.</td>
<td>Recommendations for long-term apparent and real loss reduction goals (+10 year horizon).</td>
<td>Recommendations for mid-range (5 year horizon) apparent and real loss reduction goals.</td>
<td>Recommendations for evaluating and refining loss control goals on a yearly basis.</td>
</tr>
<tr>
<td>Level V</td>
<td>Audit data is extremely valid, with no issues.</td>
<td>Recommendations for short-term and long-term loss control.</td>
<td>Recommendations for long-term apparent and real loss reduction goals (+10 year horizon).</td>
<td>Recommendations for mid-range (5 year horizon) apparent and real loss reduction goals.</td>
<td>Recommendations for evaluating and refining loss control goals on a yearly basis.</td>
</tr>
</tbody>
</table>

**Example Text:**

- Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table).
- Performance Benchmarking - ILI is meaningful in comparing real loss standing.
- Continue incremental improvements in short-term and long-term loss control interventions.
- Establish long-term apparent and real loss reduction goals (+10 year horizon).
- Establish mid-range (5 year horizon) apparent and real loss reduction goals.
- Evaluate and refine loss control goals on a yearly basis.
- Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.
- Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.
- Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management.
- Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation.
- Launch auditing and loss control team; address production metering deficiencies.
- Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.
- Establish/revise policies and procedures for data collection.
- Refine data collection practices and establish as routine business process.
- Research information on leak detection programs. Begin flowcharting analysis of customer billing system.
- Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.
- Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring.
- Refine, enhance or expand ongoing programs based upon economic justification.
- Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation.
Homework

Homework – Data Gathering

Supply data
- Produced
- Purchased
- Metering & testing

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

Meter data
- Meter inventory
- Testing policy
- Test data

System & Cost data
- Length of mains
- Connections
- Pressure
- Operating costs

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[Image of audit data]
Homework – Data Gathering

We will email you the sheet with this detail on the data request

Available by phone to talk through questions as you are assembling the data

Who Should Attend?

Representation from these key areas:

• Supply
• Operations
• Billing
• Management

Bring your laptop
Utah – Pilot Training Program
AWWA M36 Water Audits & Loss Control

Questions?

Be SMART!
Cut Water Loss!