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Small System Water Audit

Division of Water Resources

Small System Water Audit

- Why Conduct an Audit
  - Opportunity for collection of better information.
  - Can increase system capacity.
  - Can improve operational efficiency.
  - Can increase sustainability.
  - Can increase system resilience.

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The overarching purpose of conducting an audit is to decrease water loss and increase water revenue.

The small system water audit was developed in response to state legislation: Section 3.4 of Session Law 2011-374.

Conducting the audit provides an opportunity for systems to account for all infrastructure.

Conducting regular audits enables systems to do a better job managing system resources.

Conducting water audits is a team approach that should be planned for each year.

Gathering information needed for the audit is a team effort.

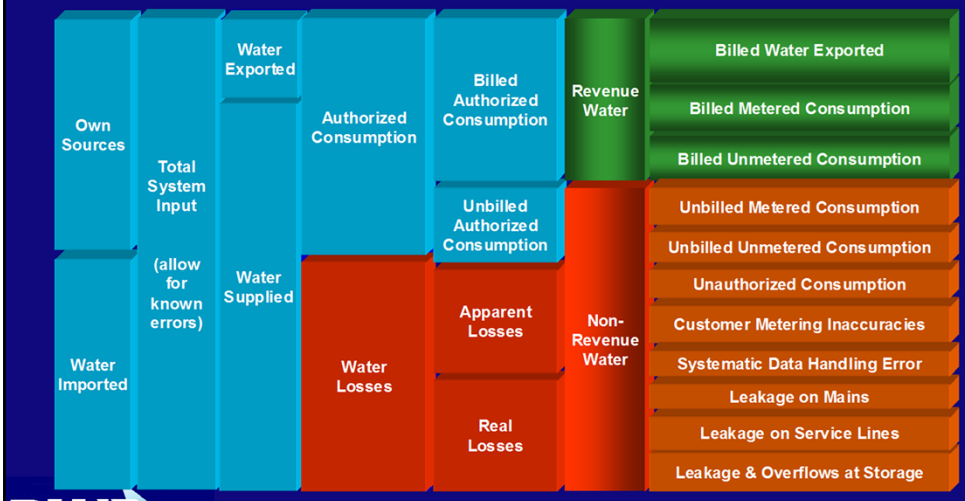
Data should be saved in a structured digital environment.

- Excel
- Asset Management Plan
- Other database

Perform a thorough reconnaissance of your system.

- All piping, valves, hydrants, tanks and meters should be accounted for.
- At this point, the purpose is not to address all infrastructure issues, but to fully account for all infrastructure.

Where is your water?
Auditing = Accounting



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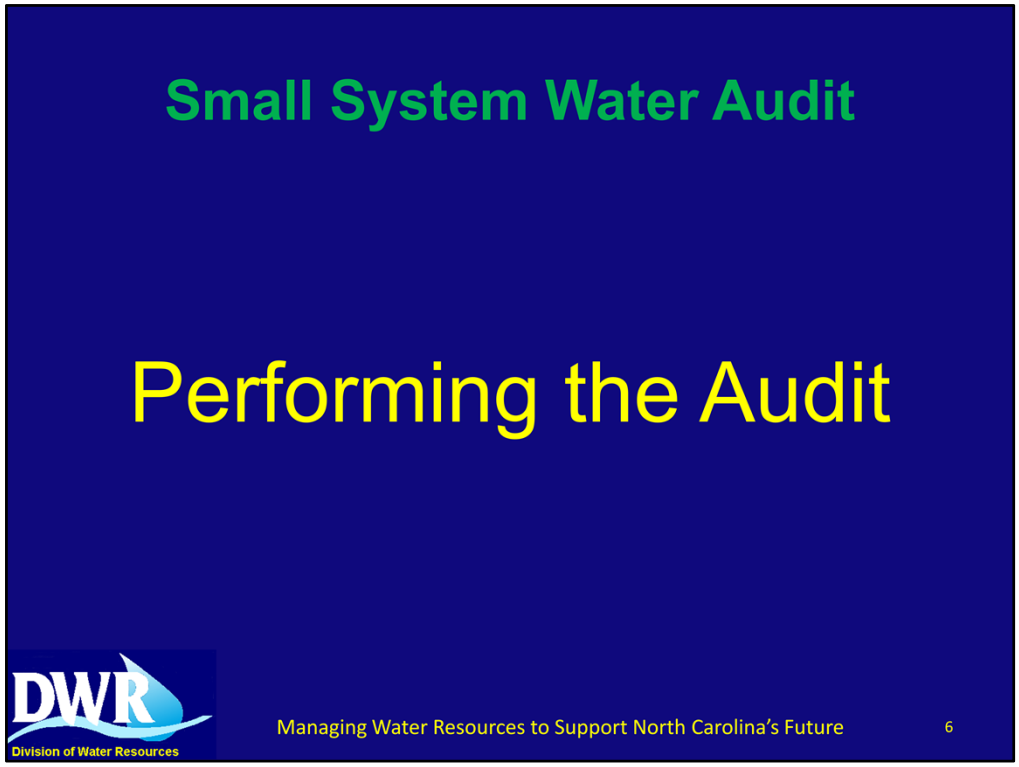
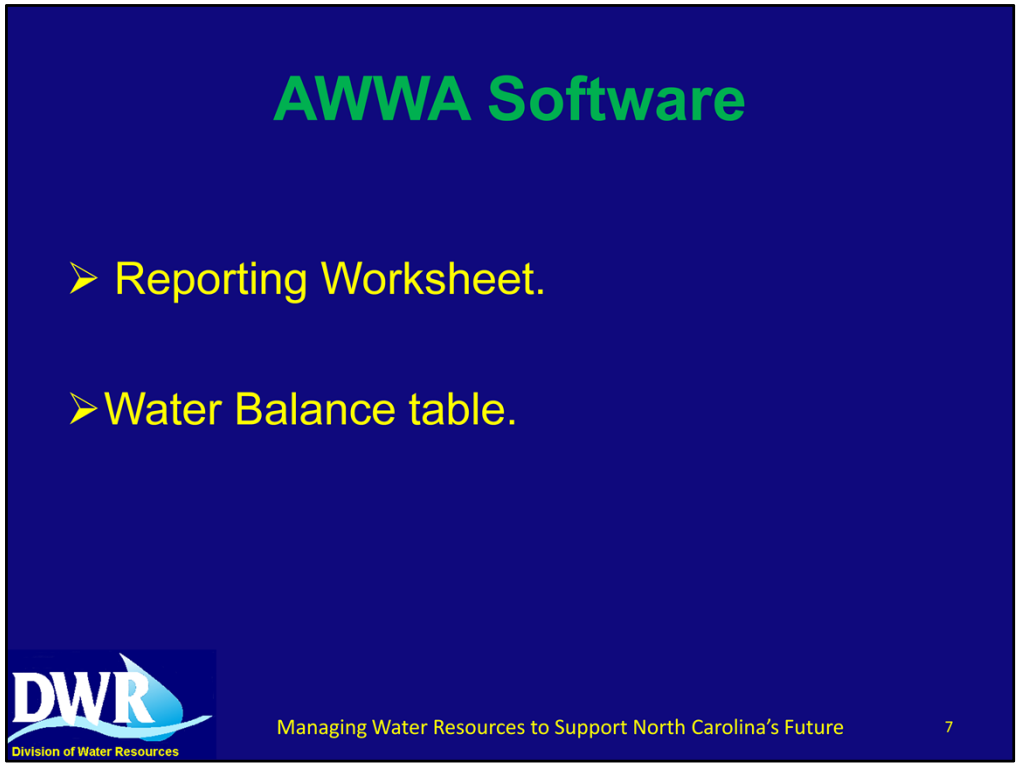
Managing Water Resources to Support North Carolina's Future 4

All water is accounted for when performing an audit, so the term unaccounted-for water is not used in this context.

The small system water audit was designed to use the same terms that are found in the local water supply plan.



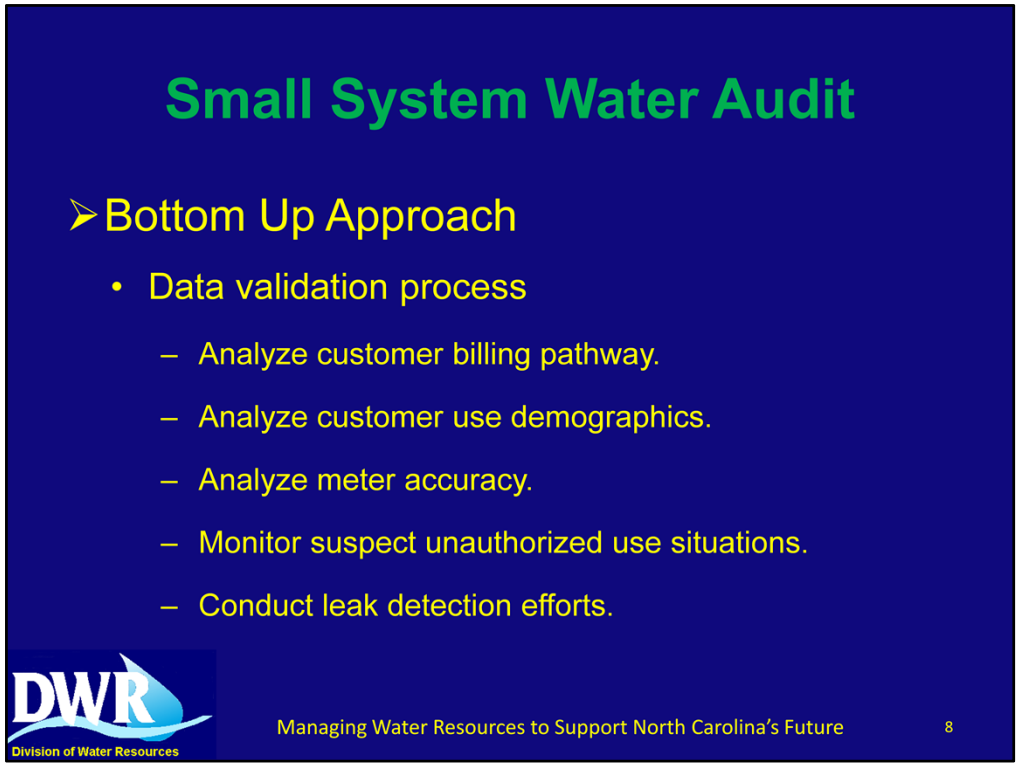
Begin the step by step process of entering data into the Water Management Table.



Briefly discuss the AWWA reporting worksheet and water balance table.

The small system water audit is designed to give identical output to the AWWA audit for:

- Non-revenue water
- Annual cost of apparent losses
- Annual cost of real losses



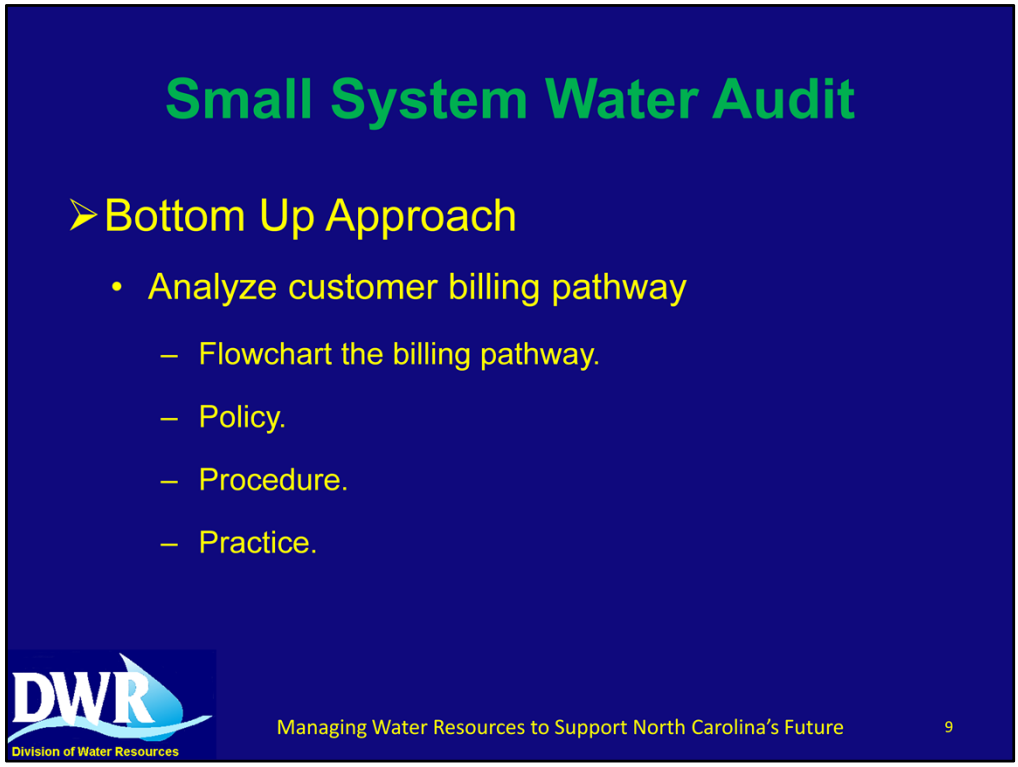
Having complete information on your system's infrastructure will make it easier to go out and perform data validation activities.

Find the best approach for your system to begin the process. For example, you may consider:

- Breaking up the system into quadrants
- Categorizing connections by meter size or user type
- Starting with older parts of town

Do what works best for your team.

Each approach will not only effect the quality of your audit, but will also impact your system's capacity (technical, financial, and managerial) to provide service.



Flowchart should show process from meter data collection through revenue collection; Should help identify problem areas in the process that could lead to:

- data handling errors
- data transfer errors
- data analysis errors

Policy should communicate guidelines related to metering, billing, and water rates.

Procedures should explain how functions are carried out for customer billing. They should also explain how to properly address billing errors (e.g. adjusting the bill without unnecessarily adjusting water volume).

Practice should be analyzed to ensure policies and procedures are being followed, and steps are taken to minimize billing errors.

Use a structured approach that accounts for all users in the system – It may be helpful to develop a water use chart by meter size or customer type to track how much water is being used.

Analyzing use trends for metered connections can give you an indication of how much water may be consumed by similar unmetered users.

Investigate uncharacteristically high or low water use – check for leaks, proper orientation of meters.

Water used from hydrants should be estimated or metered, and recorded; Getting good data from fire departments may require diligently educating the staff on the importance of accounting for all water used in the system.

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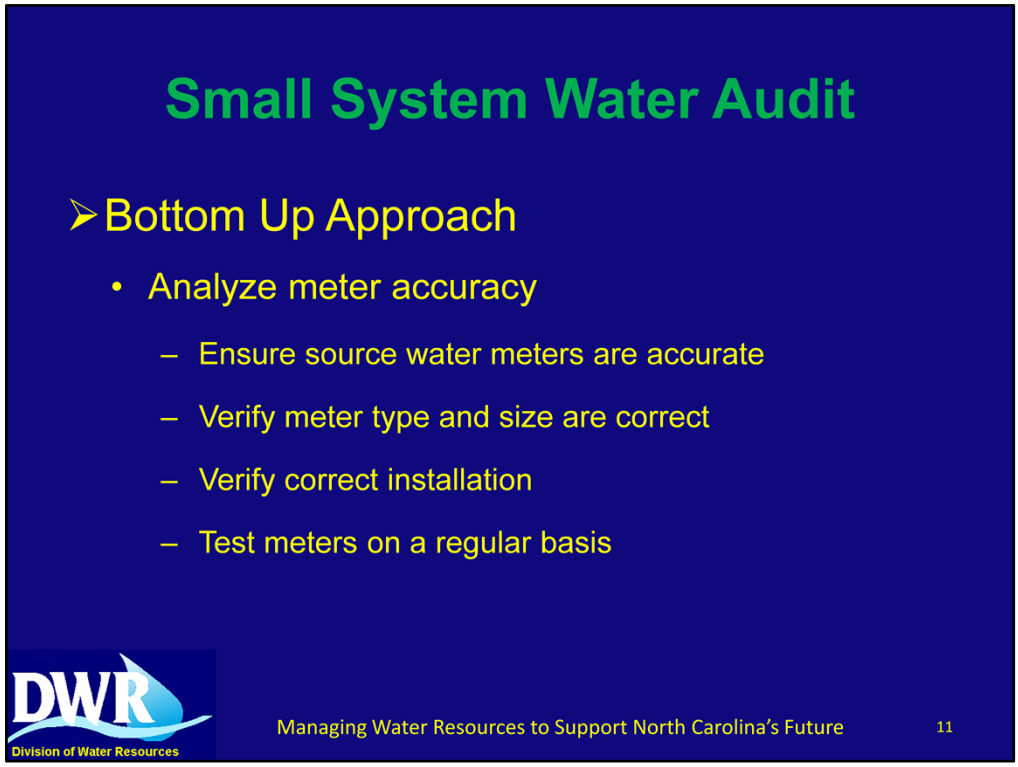


Make sure source water meters are accurate; If source water meters are incorrect, the error will be carried throughout the audit.

Check correct type and size for customer application – M6 (selection & installation); M22 (sizing lines & meters); M33 (Flow Meters in Water Supply).

Check to see that correct register was installed; check to make sure signal is transmitted from meter through SCADA system.

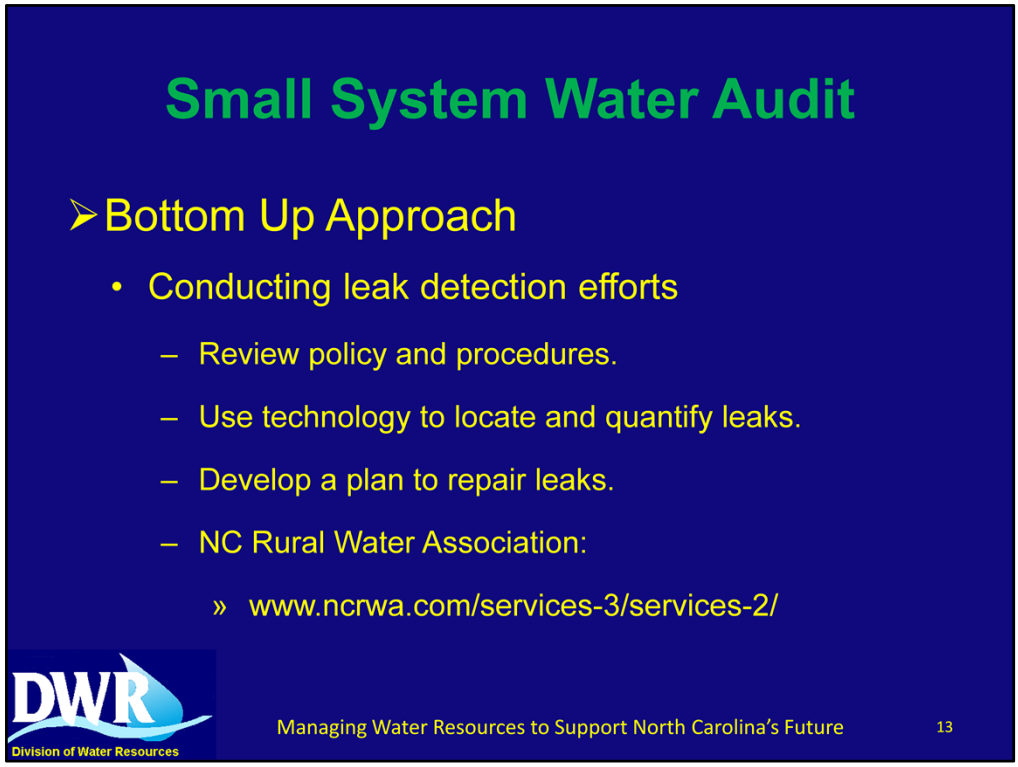
Test meters per Mfr. recommendation; 2" & up yearly with a random sample of residential meters tested also.

This task becomes more effective with all infrastructure accounted for.

Water use charts can give a visual of how much water different types of users should be consuming – can help identify meter tampering and by-pass situations.

Consider implementing a neighborhood watch program where hydrant water theft is a problem – hefty fines can deter water thieves.

Make sure your policy supports actions to prevent water theft.



Have a program where leaks are searched for and repaired on a regular basis; Don't take the approach of just repairing them whenever they're found.

Generally speaking, service line leaks are the major contributor to hidden volume losses.

Acoustic equipment and flow measurement activities in Demand Management Areas (DMAs) are used to locate and quantify leaks.

NC Rural Water Association is a good resource for water systems to use for leak detection efforts.

Information obtained on your system during the top-down and bottom-up approaches should be included in an asset management plan.

Cost-benefit analyses should be performed for identified alternatives to reduce water losses and increase revenue.

Set practical goals. Realize that all non-revenue water is not recoverable.

Once a plan of action has been identified, water rates may need to be adjusted to support action steps.

Performing water audits, asset management plan updates, and water rate analyses should be annual objectives.

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This presentation is located at the following site under Additional Tools

www.ncwater.org/Water_Supply_Planning/bmp/