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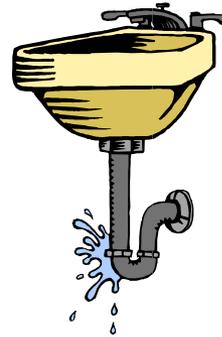
A River of Energy Solutions

Water Audit 101

Paul Roberts HydraMetrics

Water Audit 101

- Background review of water
- Understanding where water is used
- Developing measurable objectives for audit
- Conducting the audit
- Interpreting the findings
- Summarize



Background Review of Water

- Demand on our water supply
- Impact it will have on rates and costs
- Conservation makes economic sense – but also is environmentally prudent
- Reducing consumption in parallel with using alternative sources ie “net zero water” should be covered in a solutions presentation



New Security Concerns

- Plans of U.S. water systems have been found in al Qaeda hideouts.

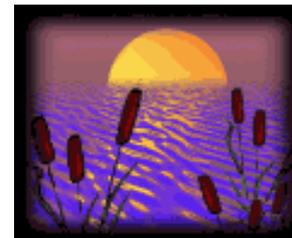
EPA funding for projects has declined. Will the Sustainable Water Infrastructure Investment Act (S.939) pass?

- Some cities are charging for added security

Each year, 14% of America's water is lost through 270,000 leaks!

Background Review of Water

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Background Review of Water

- Demand on our water supply
- Impact it will have on rates and costs
- Conservation makes economic sense – but also is environmentally prudent
- Reducing consumption in parallel with using alternative sources
 - Grey water, rainwater recovery, ect.



Understanding Where Water is Used

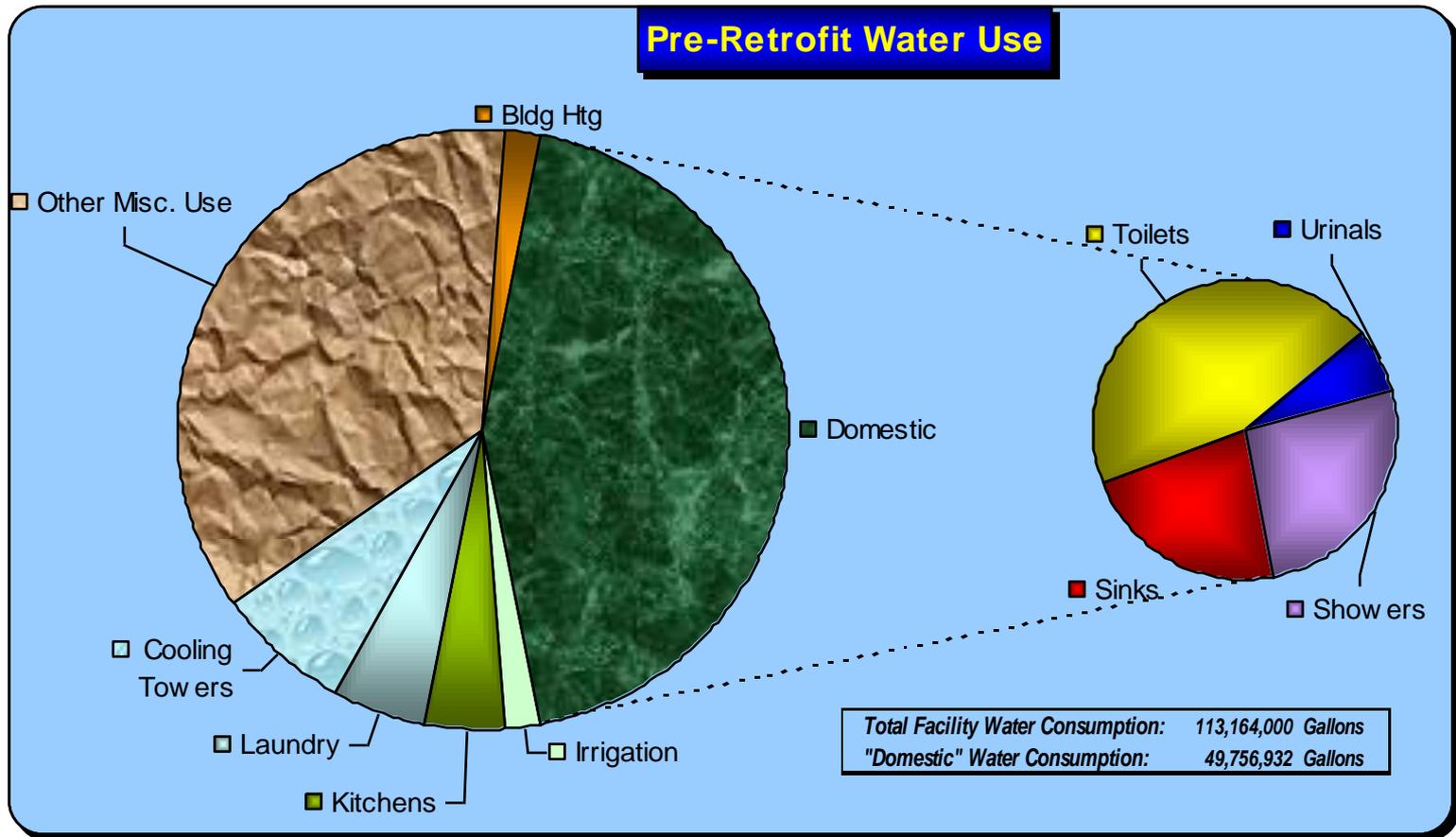
- Different uses of water at a government facility
 - domestic, HVAC, process, laundry, kitchens, cleaning, irrigation, single pass cooling systems, waste and waste water treatment, leak detection, ect.
 - geography, building function, building Age

“In the Federal sector, approximately half of the potable water consumed is used for domestic purposes”

Instructions for Implementing EO 13423

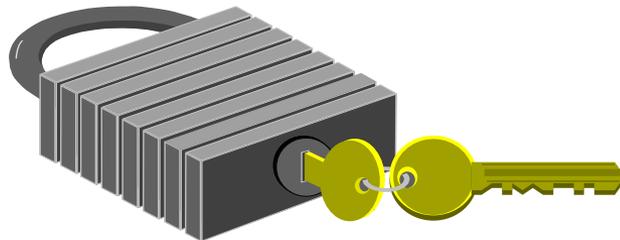


Understanding Where Water is Used



Developing Measurable Audit Objectives

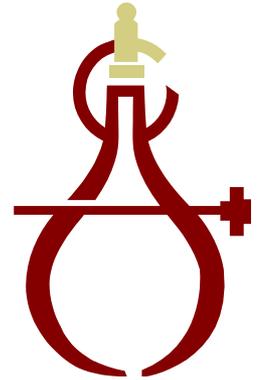
- Different than objectives for reduction
- Creates baseline for comparison
- Details “AS IS” and plans “TO BE”
- Methodology for quantifying
- Overall timeline and gathering information plan



Unlock the Potential

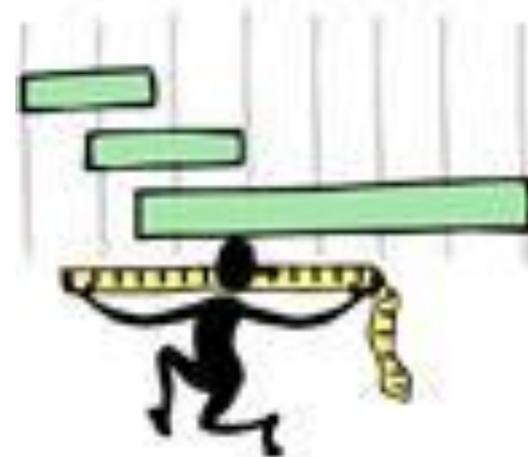
Developing Measurable Audit Objectives

- Methodology for quantifying
 1. Utility meter,
 - What can/can't be learned
 - Amount of time span (more the better, 3 year minimum)
 - Factoring seasonal use and/or comparing to other data
 2. Flow meter, instantaneous or over a period of time (why/how)
 3. Name plate data
 4. Calculated flows – when needed, and determine metrics to be used
 - Kitchens – how/what (by piece of equipment?)
 - Laundry – how/what
 - Cooling Towers – how/what
 - Irrigation – how/what
 - etc., etc.



Developing Measurable Audit Objectives

- Overall timeline and gathering information plan
 - Historical utility records (water, therm rates)
 - Equipment lists, building drawings
 - Occupancy and building use information
 - Maintenance logs detailing potential problems to be included



Conducting the Audit



- Review all collected data
- Model the collected data in a preliminary analysis
- Site evaluation and audit
 - Taking Measurements
 - Field Validate Data
 - Conduct interviews
- Compiling report



Conducting the Audit – Collected Data

- Review all collected data
 - Utility records
 - Occupancy – people use water in buildings
 - Maintenance logs
 - Equipment lists, building use



Conducting the Audit - Preliminary

- Model the collected data in a preliminary analysis
 - Estimates water use
 - Uncovers missing data and potential issues
 - Balance utilities used to the building use, occupancies, equipment, etc.
 - Provides guidance on where to focus and investigate during the site evaluation



Conducting the Audit – Site Evaluation

- Site evaluation and audit
 - Taking measurements
 - Field validate data
 - Conduct interviews to further validate the data



Conducting the Audit - Report

- Compiling report
 - What does it look like
 - Layer the information
 - Where does it go/who sees it



Interpreting the Findings

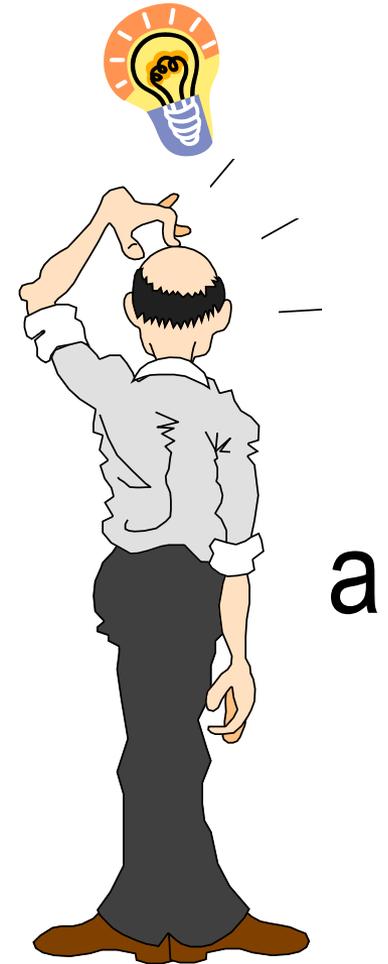
- Now benchmarks and industry standards can be used to compare
- Regardless of benchmarks – can you do better?
- List all the areas for efficiency found
- Prioritizing areas of potential to develop solutions



Wow

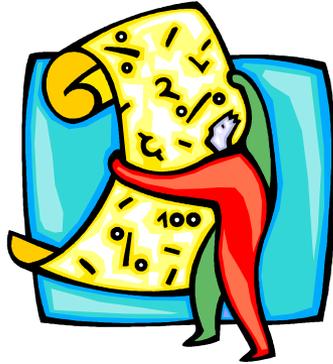
In Summary

- Try not to pre-determine solution or be biased



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In Summary



- Good data drives good decisions

In Summary

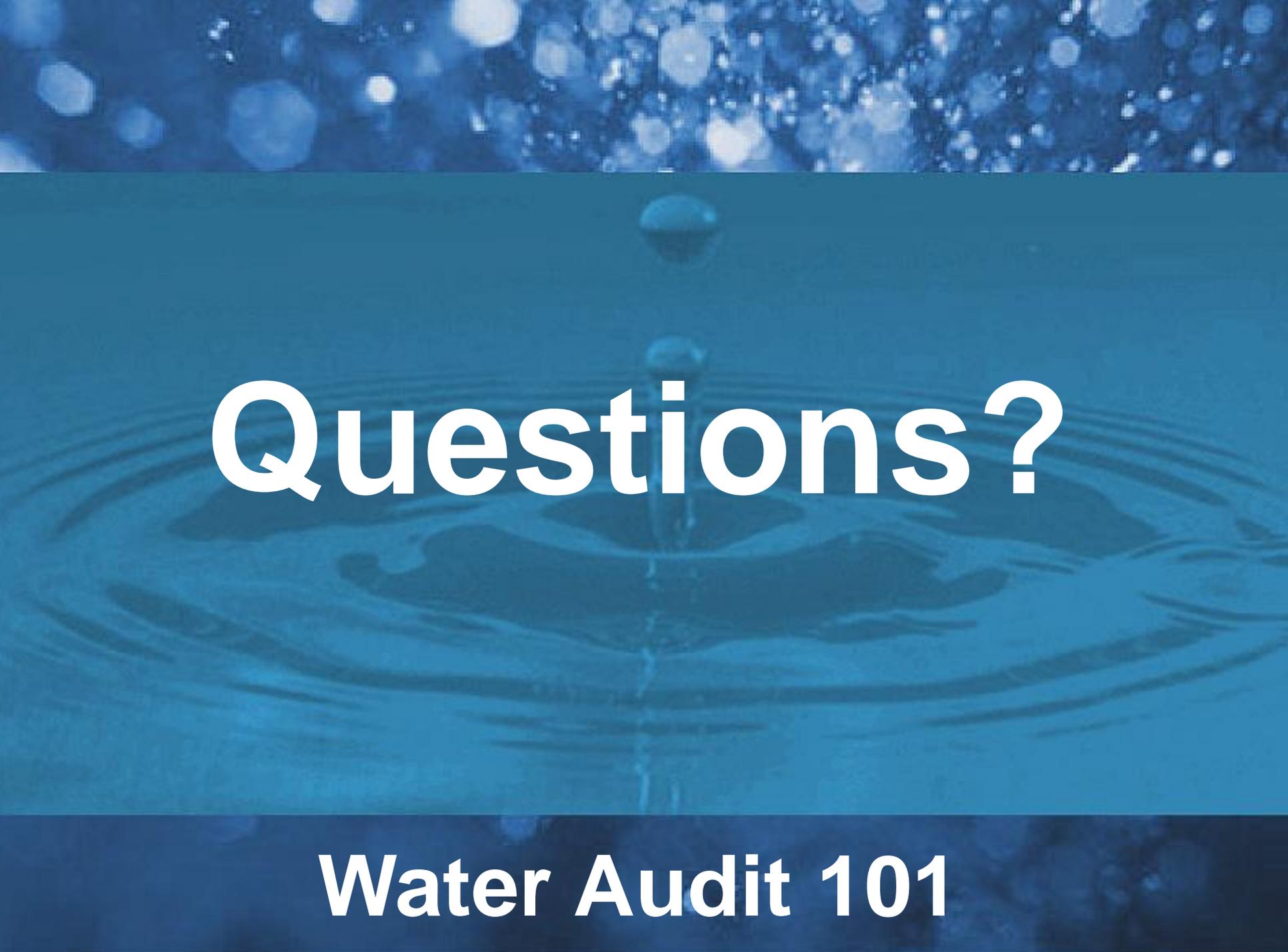
- Measurement is good for Sustainability



In Summary



- Teamwork and communication is key

The background of the slide is a blue-toned image of water splashing. At the top, there is a dense spray of water droplets. Below this, a single droplet is captured in mid-air, just above a series of concentric ripples that spread outwards from the point of impact. The overall color palette is various shades of blue, from light to dark.

Questions?

Water Audit 101