



Smart Management for
Small Water Systems

Energy Management Workshop #1

Review of the Energy Assessments



American Water Works
Association

This program is made possible under a
cooperative agreement with EPA.

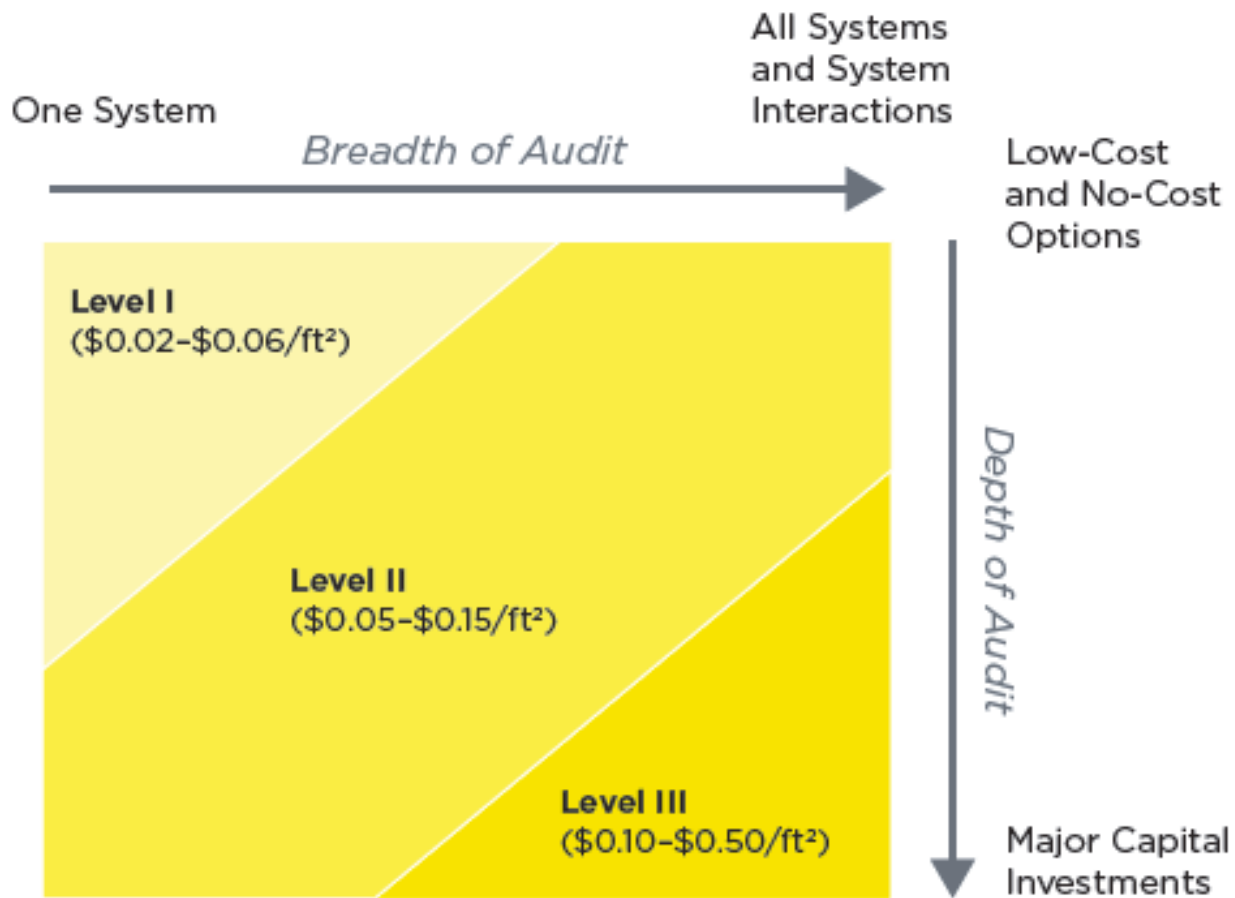


Figure 2-3 Cost and quality of the three levels of energy audits beyond preliminary analysis



Level 1 Energy Audit

1. Visit each water system to complete a “walk through” inventory of facilities.
2. Interview personnel to understand how each facility is used.
3. Gather data on energy use, facility capacity, and energy cost.
4. Prepare energy use inventory report to serve as documentation of baseline energy use of facilities and to identify potential opportunities to reduce energy use.



System	Total Annual Energy Costs to Pump and Treat Water	Total Annual Water Use (Raw, MG)	Energy Costs per MG (raw)	Average \$/kWh	Source
Beech Mountain	\$ 46,527.62	113.627	\$ 409.48		Surface
Canton	\$ 85,024.30	514.358	\$ 165.30	\$ 0.08	Surface
Diamond Head CWS					Ground
Marshall	\$ 16,648.23	52.380	\$ 317.83	\$0.12 - \$0.19	Ground
Mayodan	\$ 50,857.06	255.949	\$ 198.70	\$0.10 / \$0.17	Surface
North Wilkesboro	\$ 123,986.42	977.039	\$ 126.90	\$ 0.06	Surface
Robbinsville					Surface and Ground
Wilkesboro	\$ 168,882.62	1635.140	\$ 103.28	\$ 0.07	Surface



Review of Your Energy Assessments

- Assets – Primarily associated with drinking water system
- Nameplate Horsepower (HP)
- Variable Speed – for motors
- Calculated Power Consumption = Horsepower x 0.746 (conversion factor)



Review of Your Energy Assessments

- Hours of Operation per Year – Either based on observation or staff report
- Total kWh per Year – Calculated power consumption x Hours of operation per year
- Average Run Time - Either based on observation or staff report
- Design Specs – Based on observation (HP and head) or staff report



Review of Your Energy Assessments

- Operating Status – Based on observation or staff report
- Average Cost – Based on energy bills
- Total Cost = Total kWh per year x Average cost
- Cost per MG = Total cost/Total flow



Review and Discuss Your Audit

- What is most surprising to you?
- Are there areas that you see quick gains?
- Do you have questions?
- What next steps would you like to take after this walk-through audit?
- Do you think a more detailed audit could benefit you?
- Can you think of additional items to look at?



Use Lowest Cost Water First

- Determine the total unit cost of using each source
- Know the limitations of each source (water rights, capacity, water quality)
- Understand the additional cost of using more than one source or pump station at once
- Have prioritized source operation plans that maximize the use of lower cost water.

Source: Steve Jones/Hasen, Allen, and Luce



Use Lowest Cost Water First

- Automate the prioritized operation plan as much as possible.
- Use proper PRV settings and controls settings that don't allow high cost water to be used over low cost water.
- Keep higher cost water where it is needed
- Maximize the use of lower cost water in the areas of the system where it can be used

Source: Steve Jones/Hasen, Allen, and Luce