

Water Loss Control

Glenn Barnes



WATER FINANCE
ASSISTANCE

Session Objectives

- Explain non-revenue water
- Describe the water audit process
- Measure the cost of different types of non-revenue water



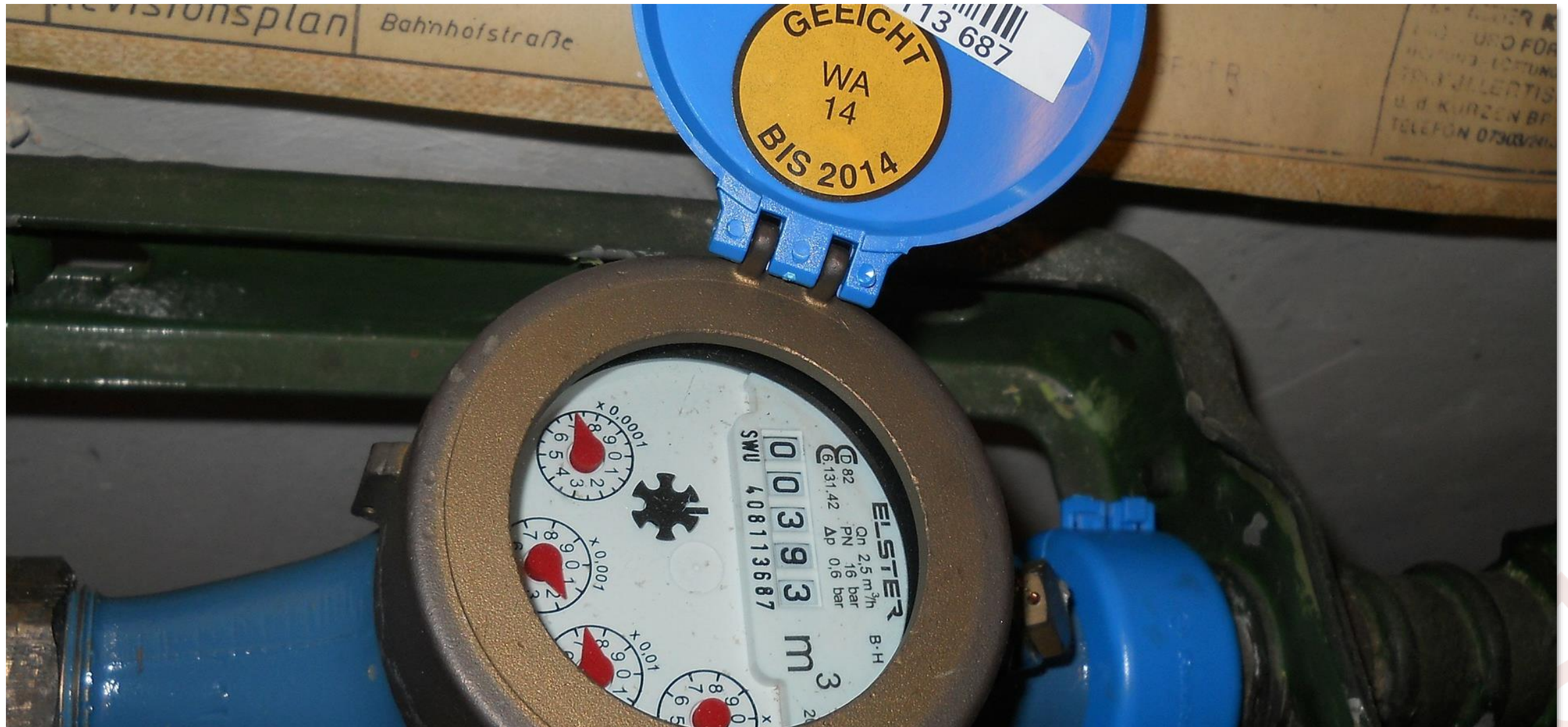
We treat water...



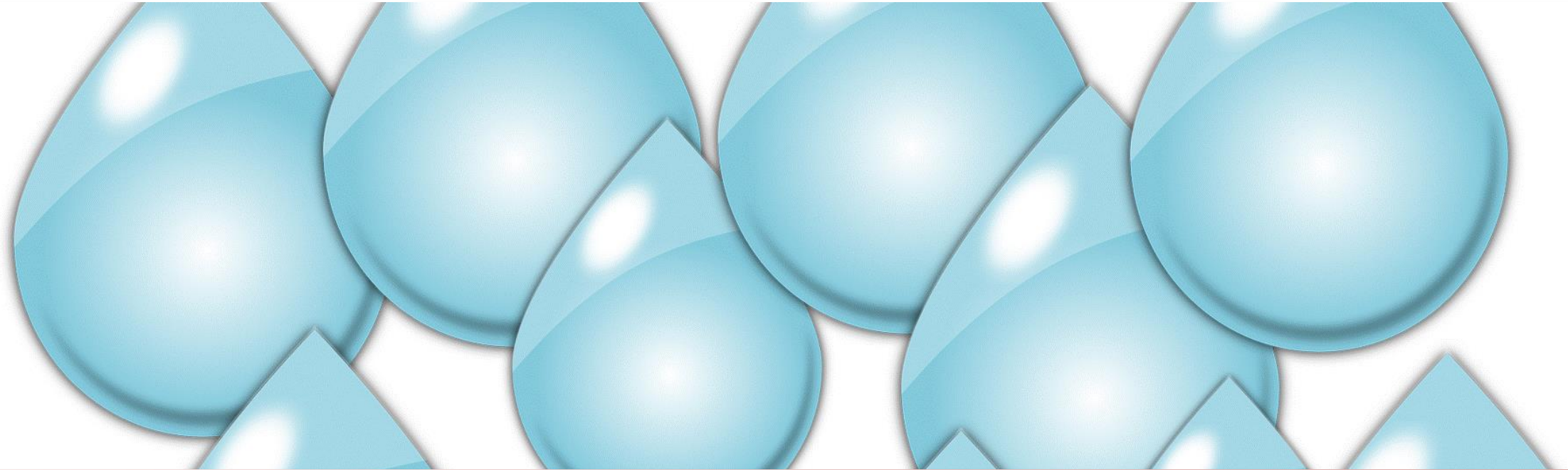
...send it through pipes...



...and our customers use it



Along the way, some water “disappears”



Non-Revenue Water

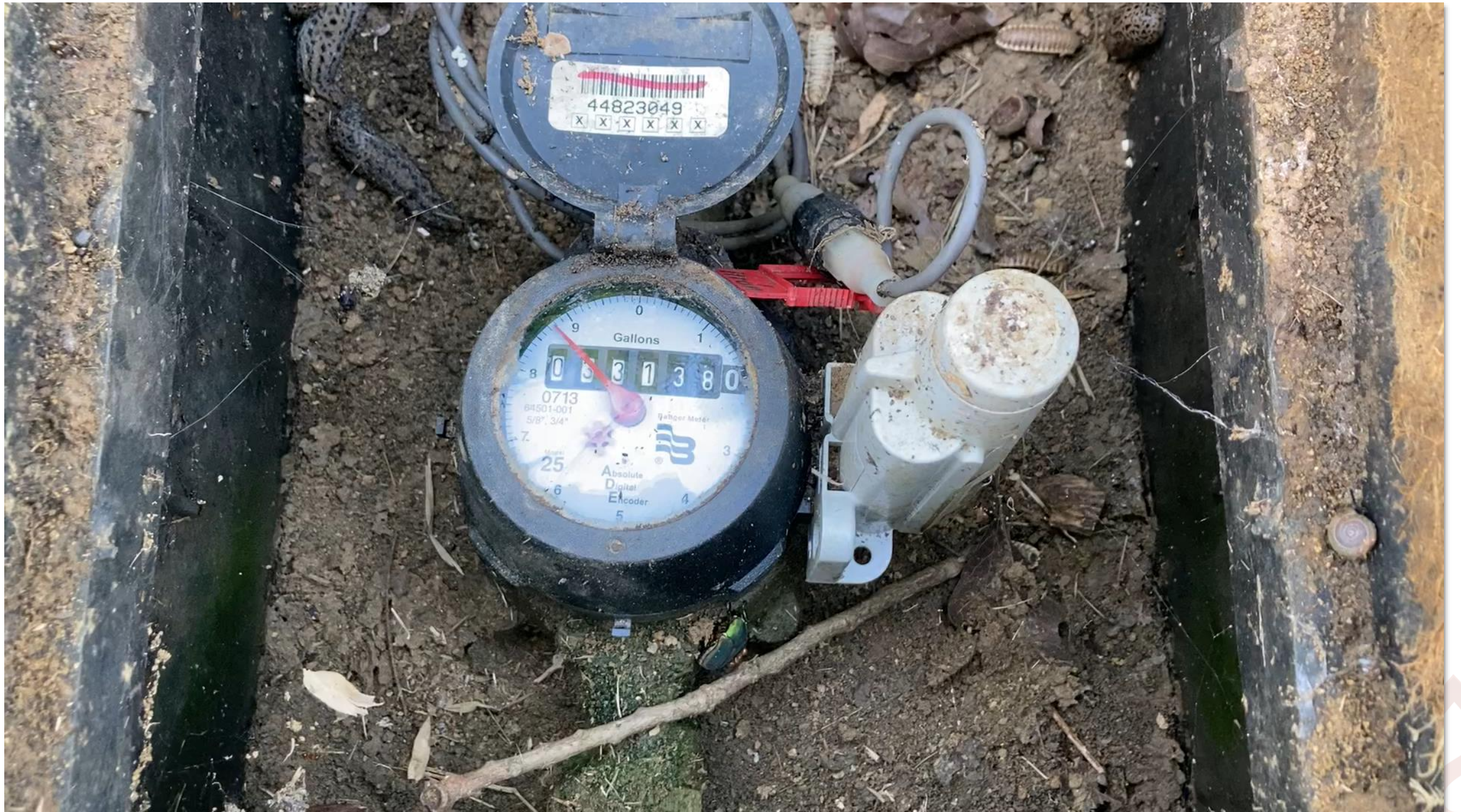
Where does it **go**?





Video credit Andrew Russell on Flickr under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)





44823049
X X X X X X

Gallons
0 9 1
8 0 3 1 3 8 0
0713
64501-001
5/8", 3/4"
25
Absolute
Digital
Encoder

White container with a handle and a cap, possibly for water sampling or measurement.



Non-Revenue Water

Gallons Treated

– Gallons Metered



Grant Valley

Population

2,114

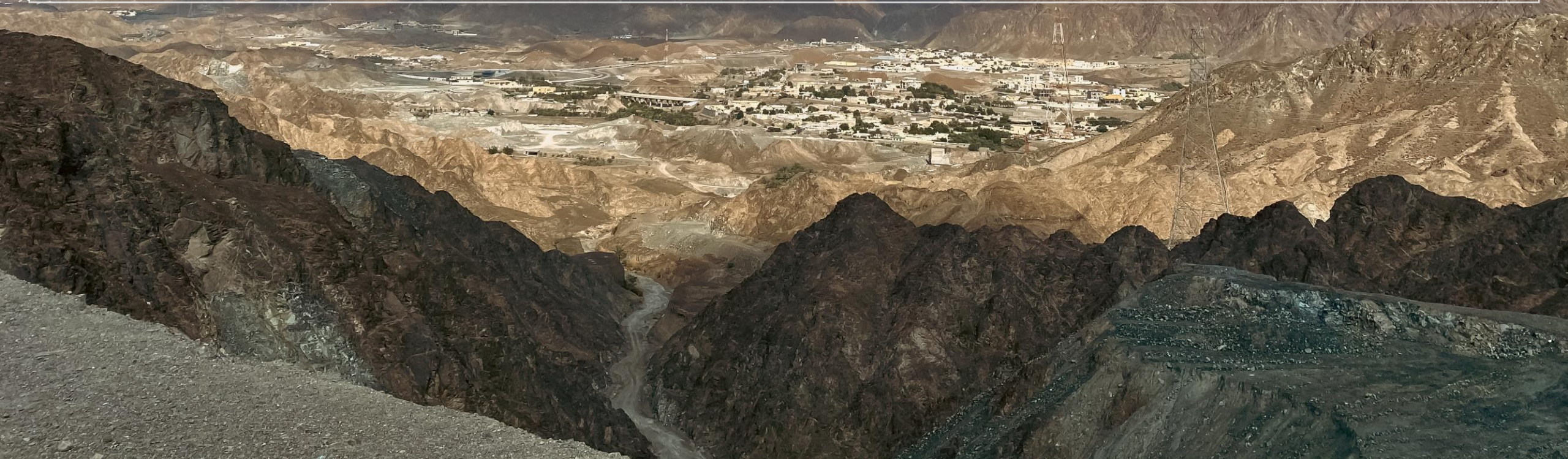
Median Household
Income

\$31,571

Service Connections 813

Annual Water
Gallons Sold

42,879,548



Grant Valley Calculation

53,987,598 gallons treated

— 42,879,548 gallons metered

11,108,050 gallons
non-revenue water



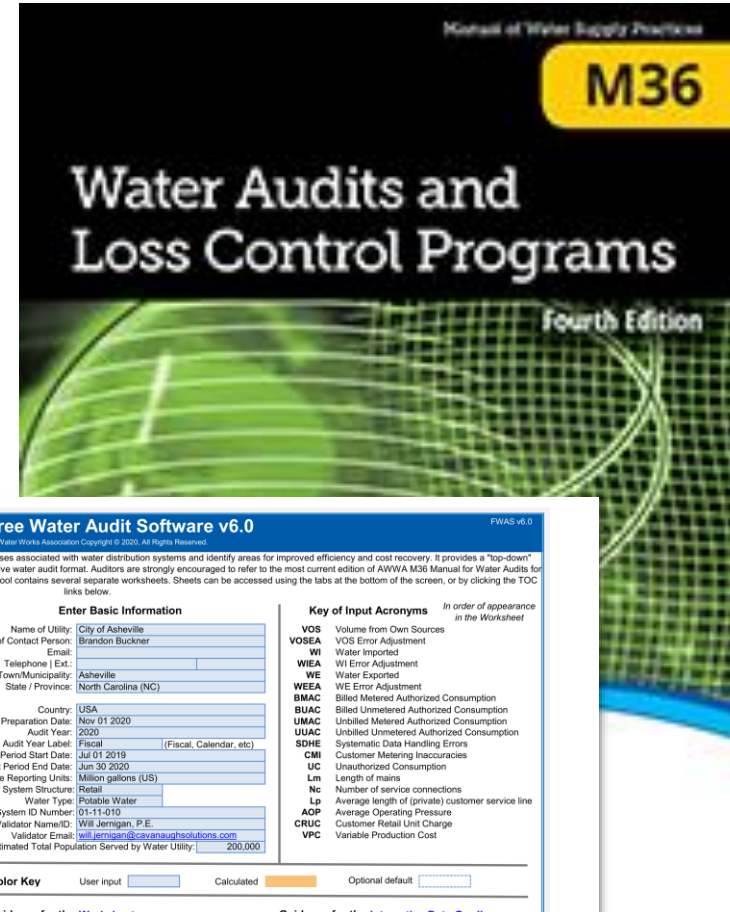
Simple But Unhelpful Calculation

- This simple calculation tells you *if* water loss exists, but it doesn't shed any light on *why* you are treating more water than you are metered
- It can lead you to take expensive and unnecessary actions



AWWA Methodology Changes Everything

- A way to measure not just the amount of water loss but also what is causing it



- Now we have **water audits**

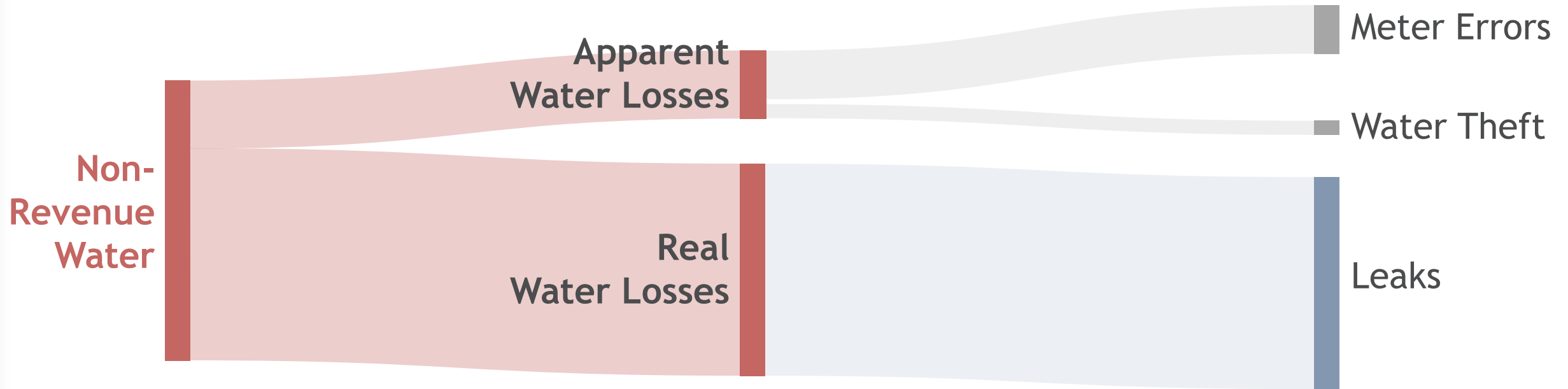
The screenshot displays the AWWA Free Water Audit Software v6.0 interface. It is divided into several sections: "Table of Contents (TOC)" on the left, "Enter Basic Information" in the center, and "Key of Input Acronyms" on the right. The "Enter Basic Information" section contains a form with fields for utility name, contact person, location, audit year, and population. The "Key of Input Acronyms" section lists various codes used in the software, such as VOS, WIEA, and UMIC. At the bottom, there are sections for "Color Key" and "Guidance for the Worksheet" and "Guidance for the Interactive Data Grading".

Data Needed

- Volume of water pumped and treated by the utility
- Volume of water purchased
- Volume of water read by customer meters
- Volume of water sold in bulk to other utilities
- Length of the utility's water mains
- Number of service connections
- Average operating pressure of system
- Total annual operating cost of the utility
- Cost of treating a gallon of water
- Volumetric rate charged to customers



After the Water Audit



After the Water Audit

Total Non-Revenue Water	11,108,050
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Meter Errors	Apparent Losses	2,221,609
Water Theft	Apparent Losses	555,403
Leaks	Real Losses	8,331,038



Cost of Leaks

- Cost of leaks is the cost of treating a gallon of water
- This includes the total cost of treatment chemicals and supplies as well as electricity



#	Water Service	Annual Budget
1	Regular Salaries	\$133,000
2	Overtime	\$11,000
3	Group Insurance	\$28,000
4	Payroll Tax	\$11,348
5	Retirement	\$12,875
6	Professional Services	\$12,150
7	Solid Waste Disposal	\$1,500
8	Repairs & Maintenance -- Lines	\$43,000
9	Repairs & Maintenance -- Wells	\$15,000
10	Repairs & Maintenance -- Equipment	\$16,000
11	Repairs & Maintenance -- Vehicles	\$1,000
12	Repairs & Maintenance -- Buildings	\$2,000
13	Rentals & Leases	\$500
14	Liability Insurance	\$12,500
15	Communications & Advertising	\$10,720
16	Bank Fees	\$180
17	Travel	\$500
18	Dues & Fees	\$850
19	Education & Training	\$500
20	General Supplies & Materials	\$50,000
21	Electricity	\$31,000
22	Gasoline	\$3,200
23	Natural Gas	\$6,275
24	Small Equipment	\$500
25	USDA Principal and Interest	\$37,811
	TOTAL WATER EXPENSE	\$441,409

$$\frac{\$81,000}{53,987,598} = \$0.0015 \text{ (per gallon)}$$



Cost of Meter Errors and Theft

- Cost of meter errors and theft is the price customers pay for a gallon of water (the volumetric rate)



Grant Valley Rate

- Flat: \$30.00 per month
- Volumetric: \$5.76 per 1,000 gallons

$$\frac{\$5.76}{1,000} = \$0.00576 \text{ (per gallon)}$$



Financial Impact

Meter Errors & Theft

Gallons 2,777,012

Per Gallon Cost × \$0.00576

\$15,996

Leaks

Gallons 8,331,038

Per Gallon Cost × \$0.0015

\$12,497



Free technical assistance from ITCA for Water Audits for the first time!



Thank You!



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