

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com





Chasing Down High Water Use in Commercial Settings

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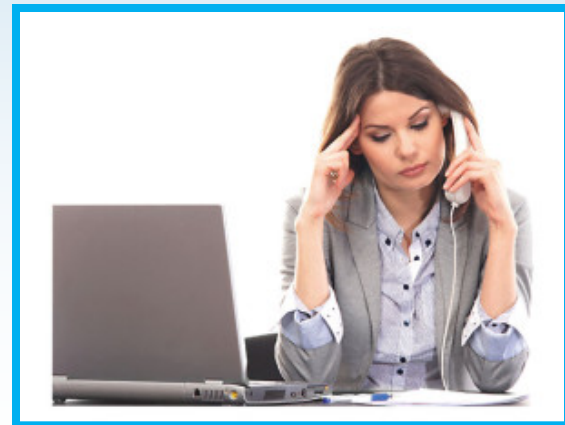
Bottling Plant

- Average consumption = 79,000 gpd
- It's only a "trickle"
- Trickle = 8,000 gpd



Unexpected Increase

- “We have had a plumber come out”
- “No way we are using that much water”
- “There is something wrong with the water meter”



Is it the Meter?

- Positive displacement meters -
Unlikely
- Turbine / Electronic meters -
Possibly



Is it the Meter?

- Mis-read
 - 2527 Ccf
 - 2725 Ccf
- 150,000 gallon mistake



Is it the Meter?

- Wrong register size
 - Up to 15 times actual use



Toilets!

- 42% of surveys – malfunctioning toilet
 - Flapper...float....over flow pipe...fill valve...gaskets...design issues....



Toilet Leaks - Myth #1

- Tenants / Employees will inform you about a leak.
 - Ignore issue
 - Try to fix it themselves





The Duct Tape Fix



Plastic Bag Approach



Shoelace – Popsicle Stick



Foil Deflector



Toilet Myth #2

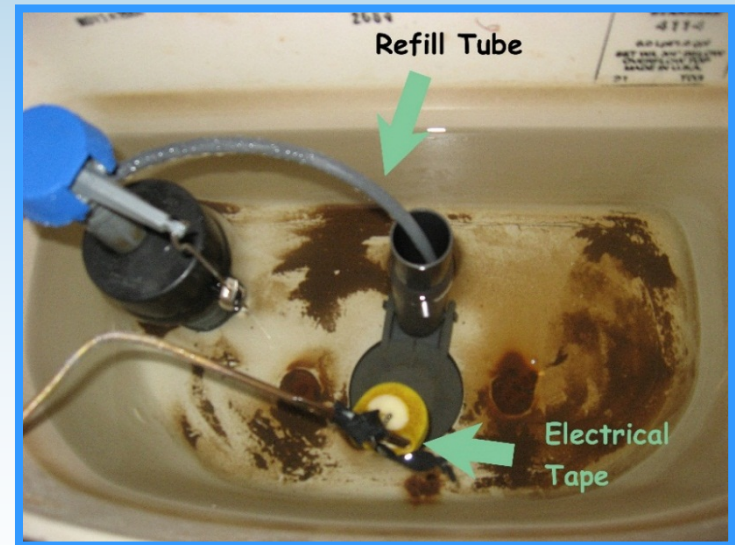
- Don't leak much water
 - 10 to 100 gpd
 - 1000s gpd
- 5000 gpd (current record)





Toilet Leaks

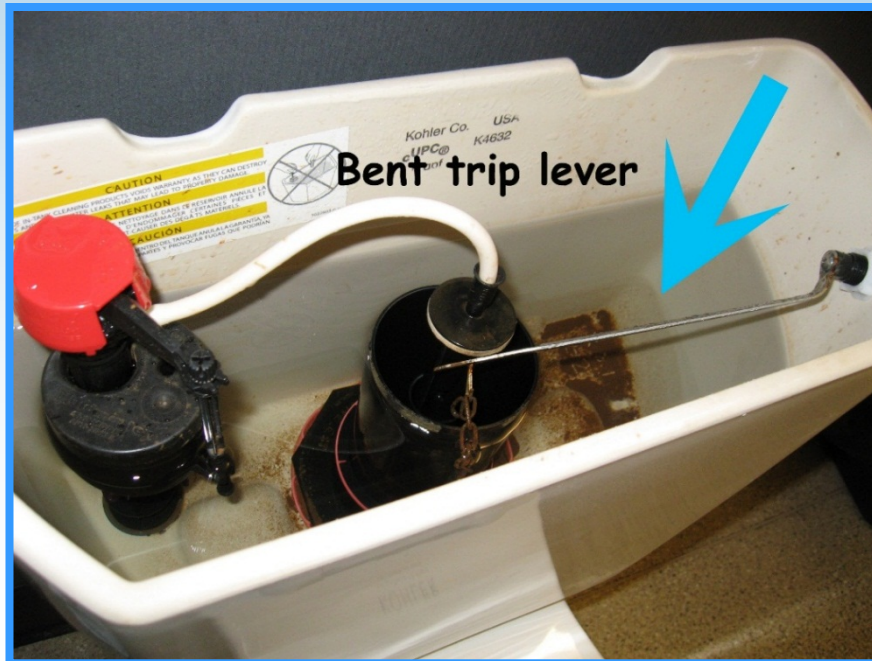
- Refill tube creates syphon
- 400 gpd





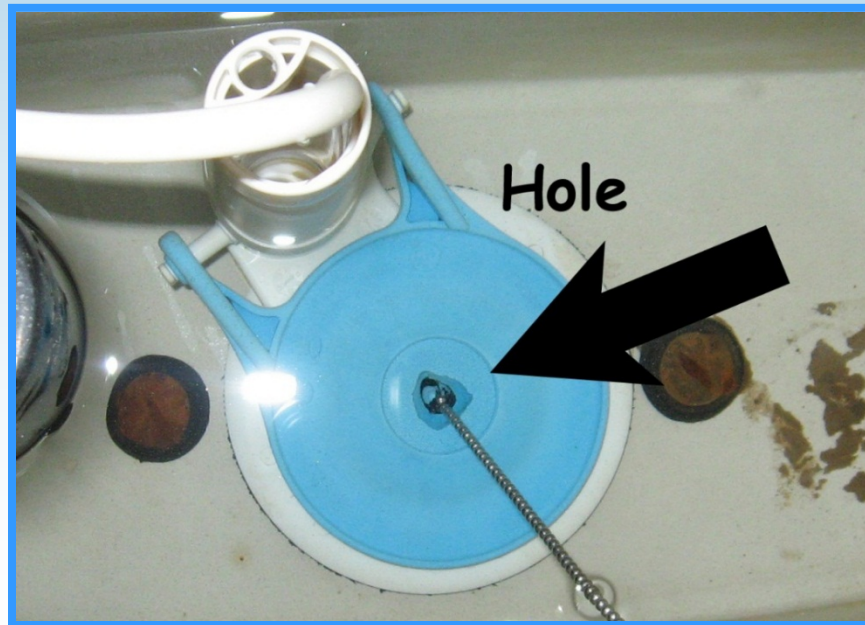
Toilet Leaks

- Design issue
- 3,300 gpd



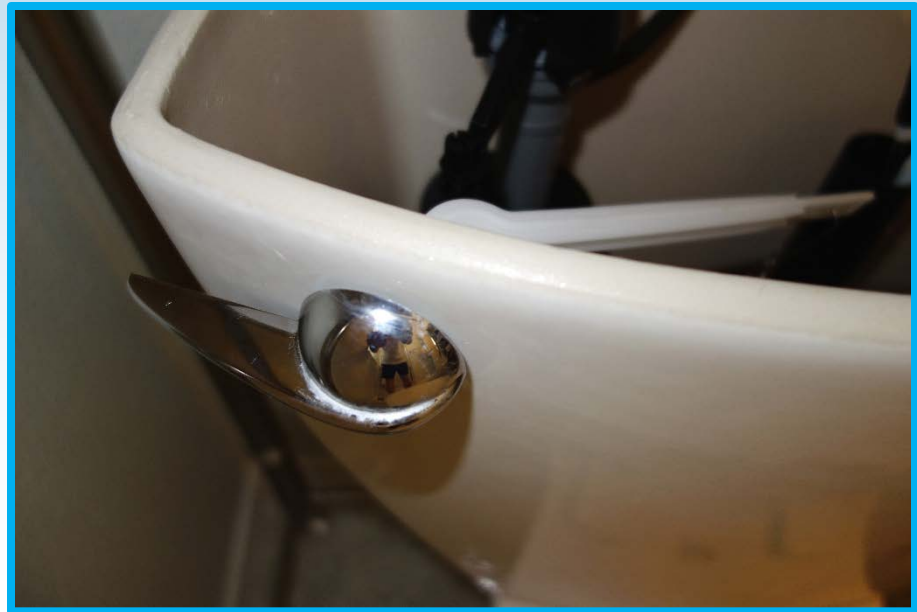
Toilet Leaks

- Maintenance issues and wear
- 1,800 gpd



Toilet Leaks

- Flush handle binds
- 1,000 gpd



Toilet Leaks

- Chain gets caught or kinked
- 800 gpd



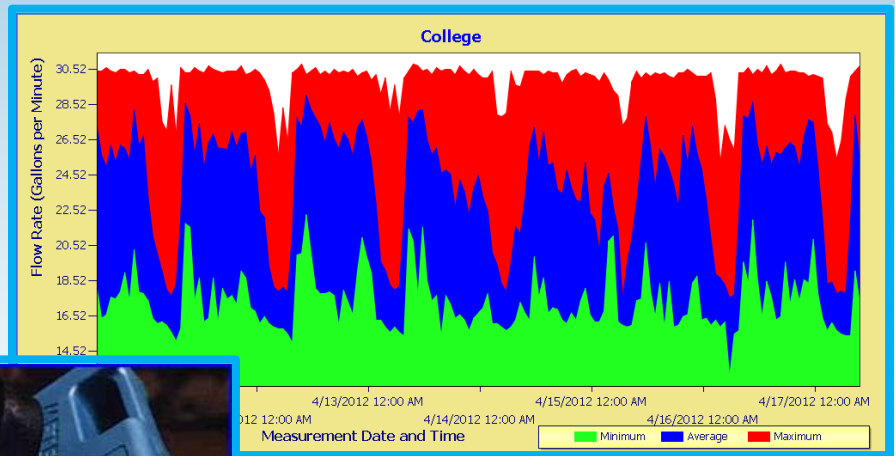
Toilet Leaks

- Broken fill valve
- 5,000 gpd



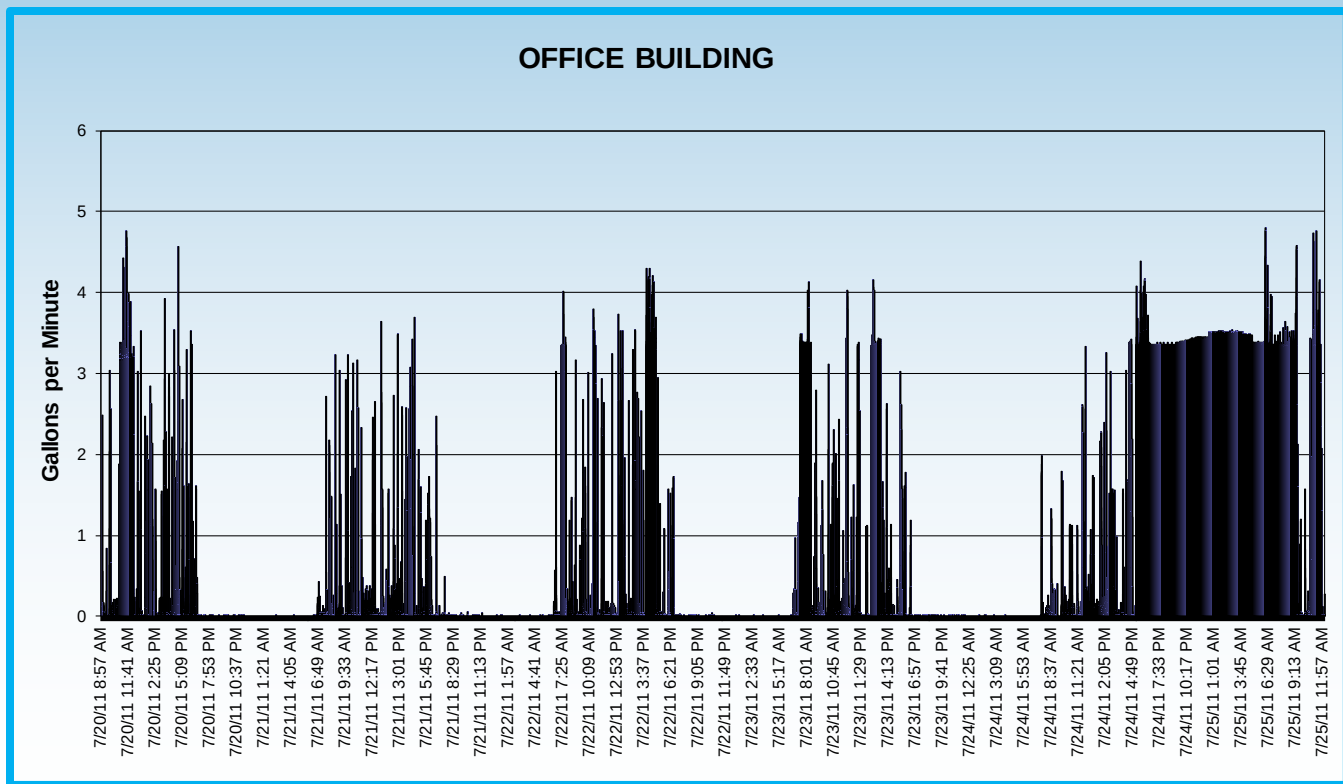
Data Logging

- 24-hour water use recording
- 7 days



Intermittent Toilet Leak

- 3,200 gallons in 16 hours



Single-pass Cooling

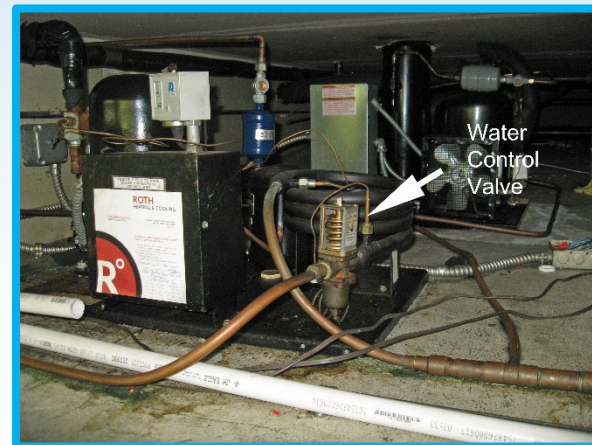
Transferring heat to water and discharging to drain.

- 11% of surveys find failed or failing water control valve.
- 80% are found in restaurants



Single-pass Cooling

- Restaurant with 8 water-cooled condensers
 - Walk-in coolers
 - Keg coolers



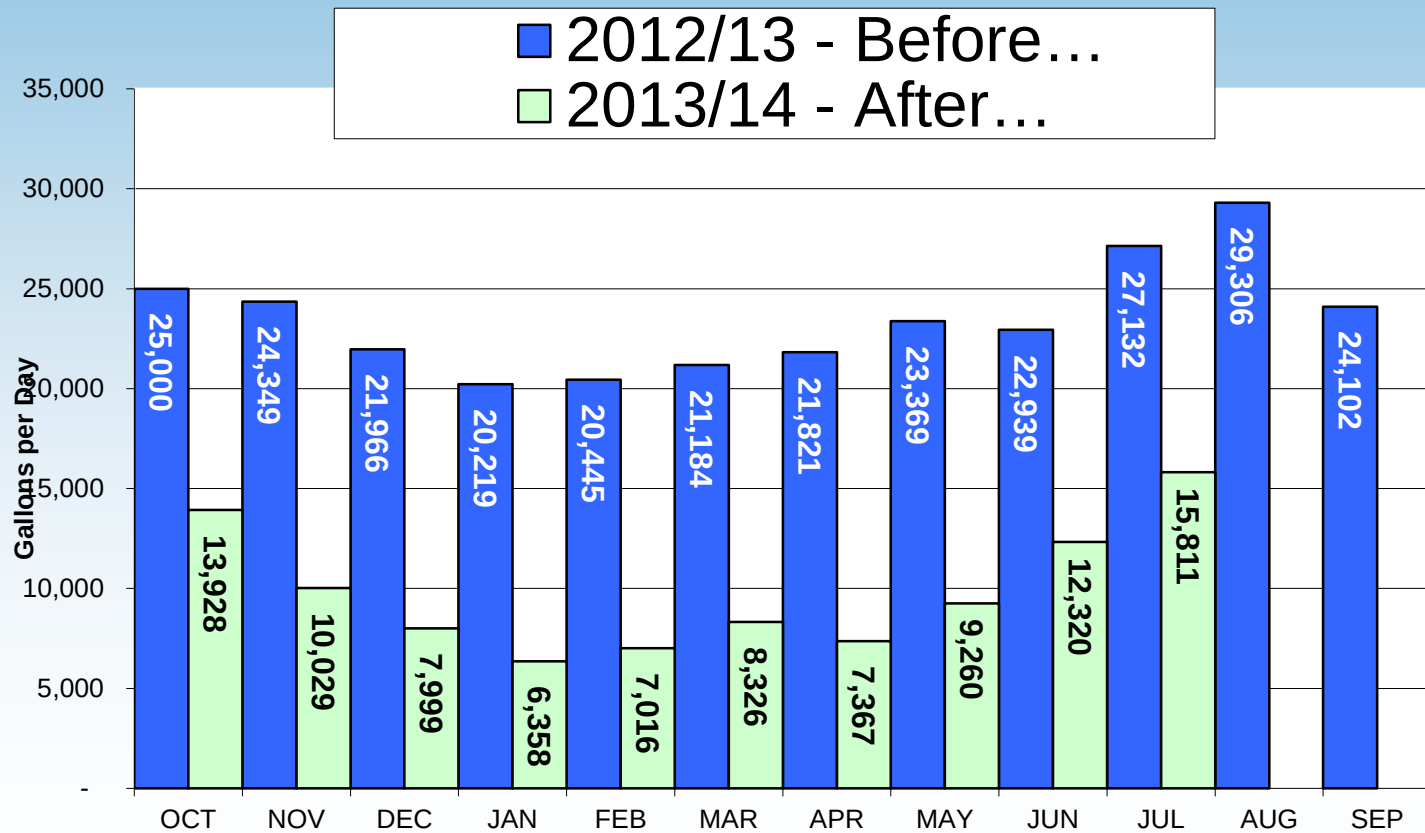
Single-pass Cooling

- Expected discharge temperature
 - $\approx 100^{\circ}$ F
- Tested discharge temperature
 - 65° F to 80° F



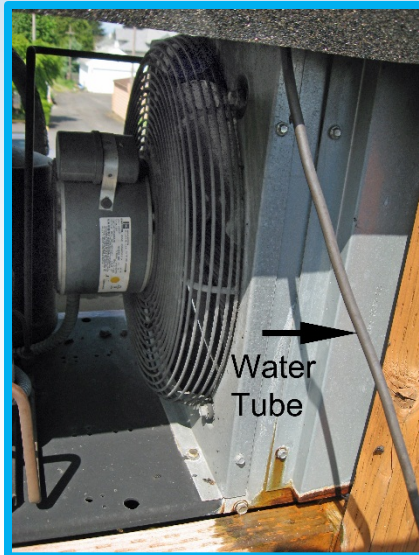
Single-pass Cooling

Water Use Comparison



Innovative Cooling

- Increase in use of 700 gpd
- Swamp cooler?
- Air-cooled condenser



Swamp Coolers

- Out of site out of mind
- Water loss from 400 to 1,500 gpd



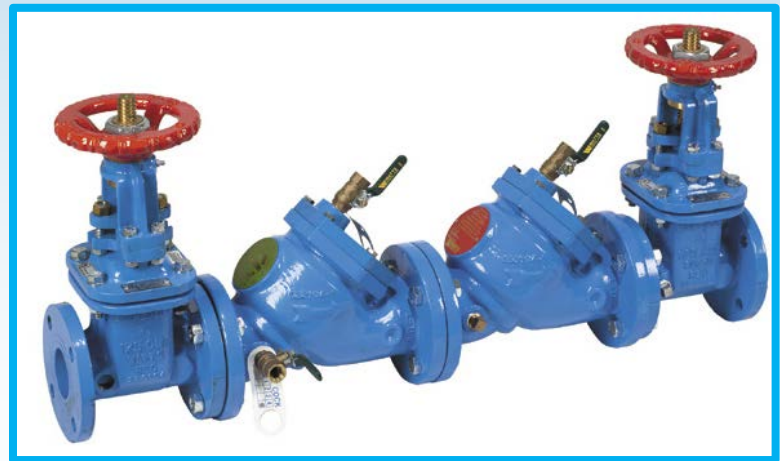
Underground Leaks

- Myth
 - Water always comes to the surface
- Mostly true
 - Meter turns constantly



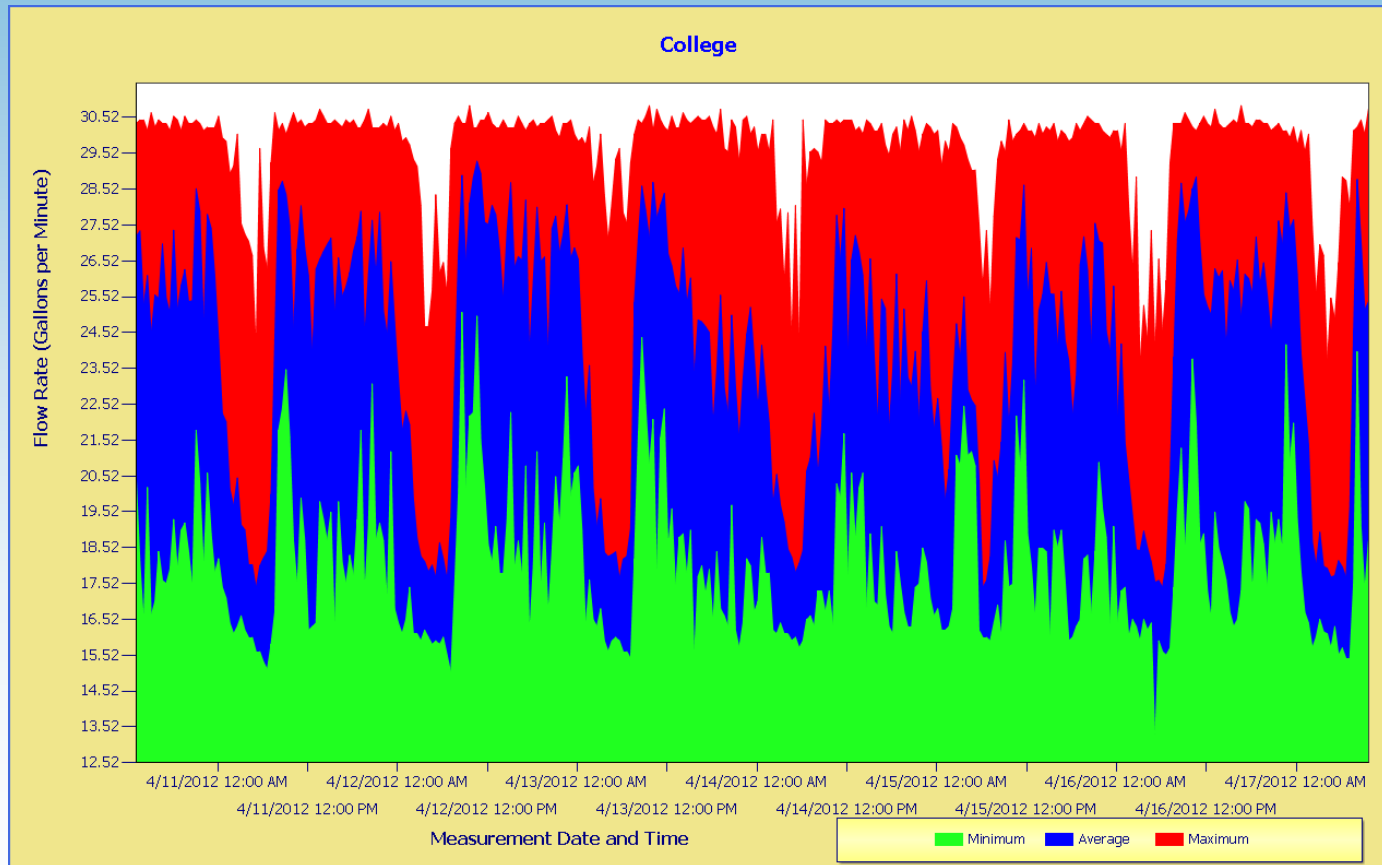
Underground Leaks

- Meter turns 7 minutes
- Meter stops 5 minutes





College Campus





College Campus

- Clues:
 - Warm water in the toilet tank
 - A few living units had “warm” floors



College Campus

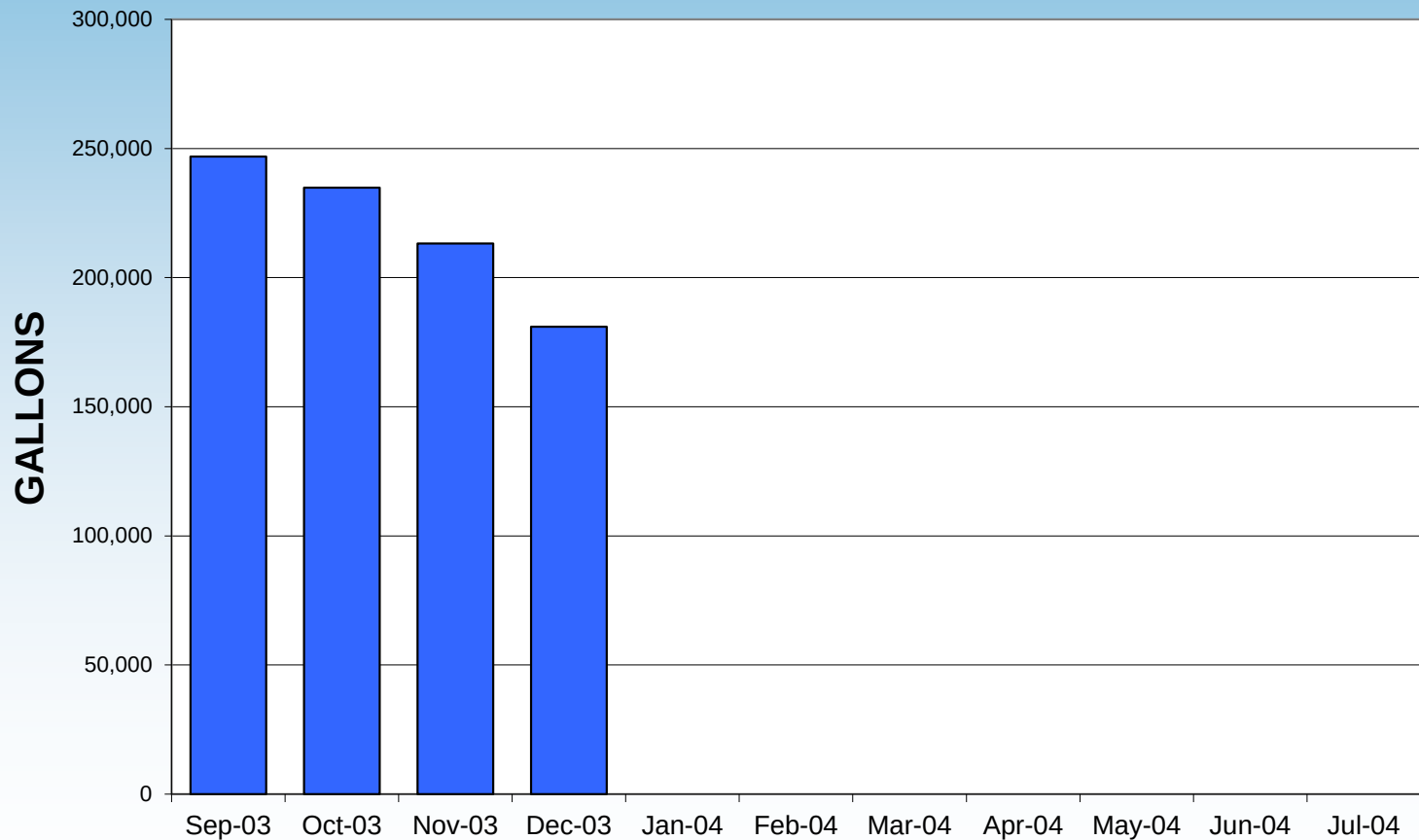
- Repaired hot water pipe.
 - Savings:
 - 17,500 gpd
 - 6.4 MGY





How Much Should I Use?

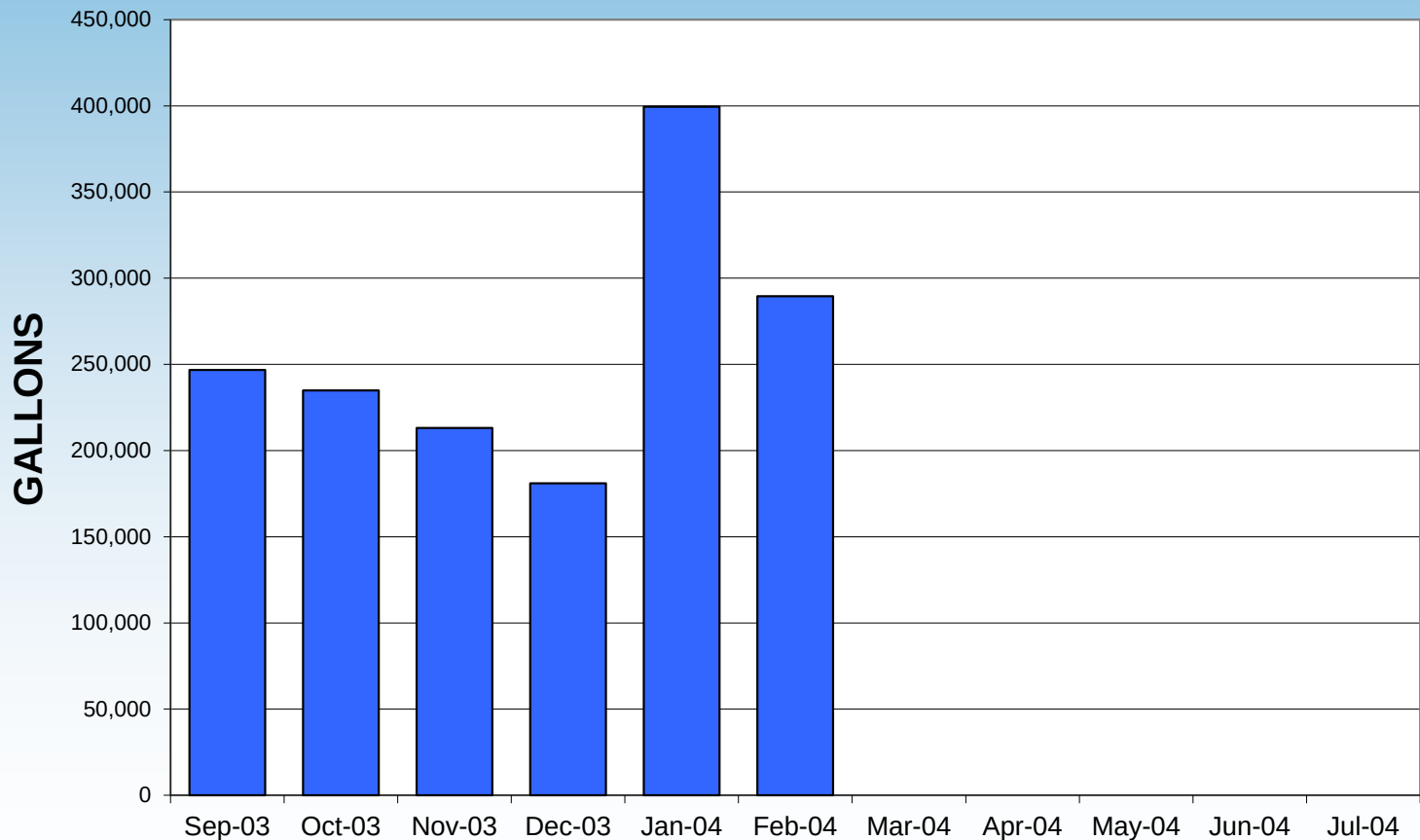
Monthly Water Use





How Much Should I Use?

Monthly Water Use



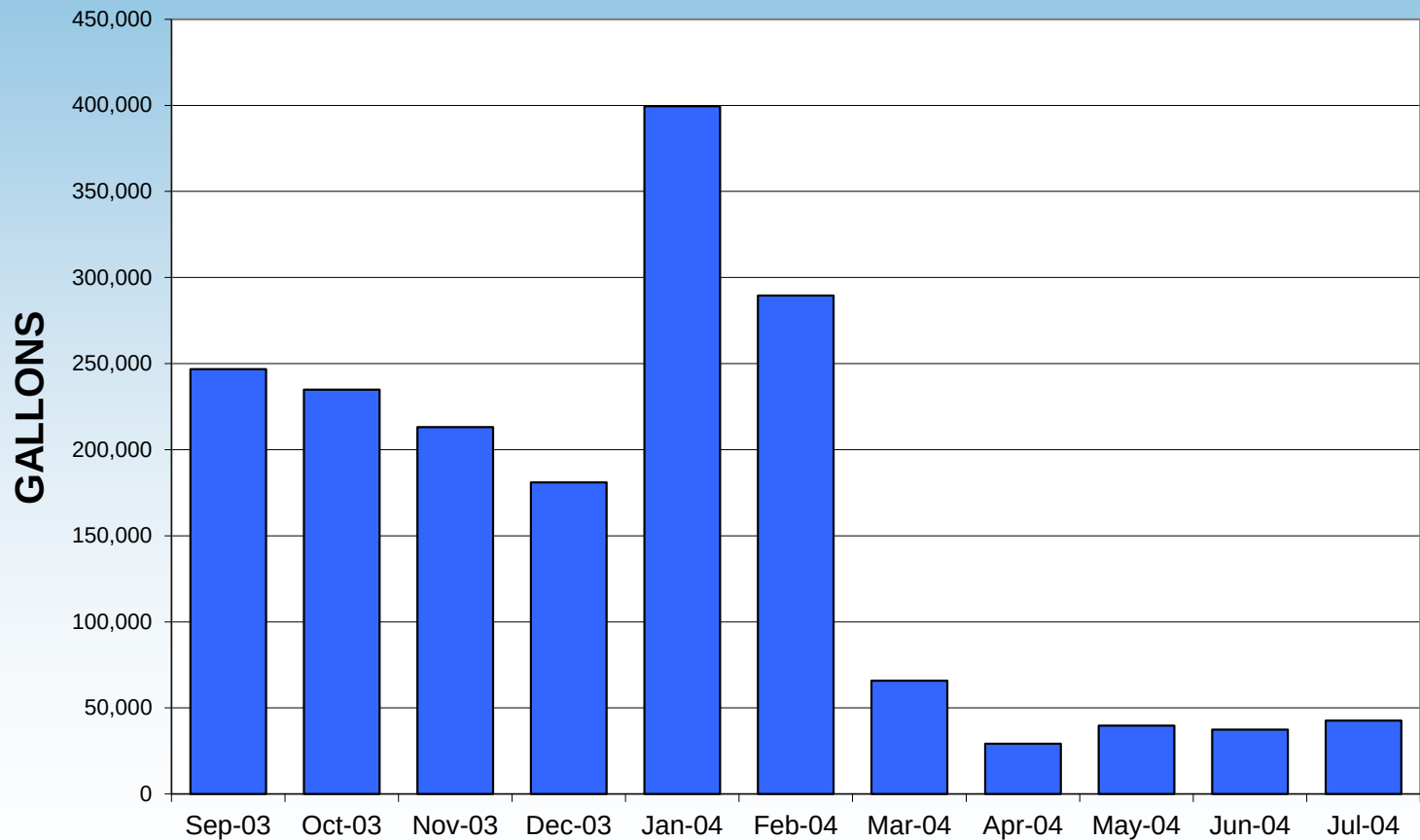
Underground Leak





How Much Should I Use?

Monthly Water Use



College Housing

- 43,600 gpd



College Housing

- Trap primer
- Use dropped to 30,500 gpd
 - Savings of 13,100 gpd



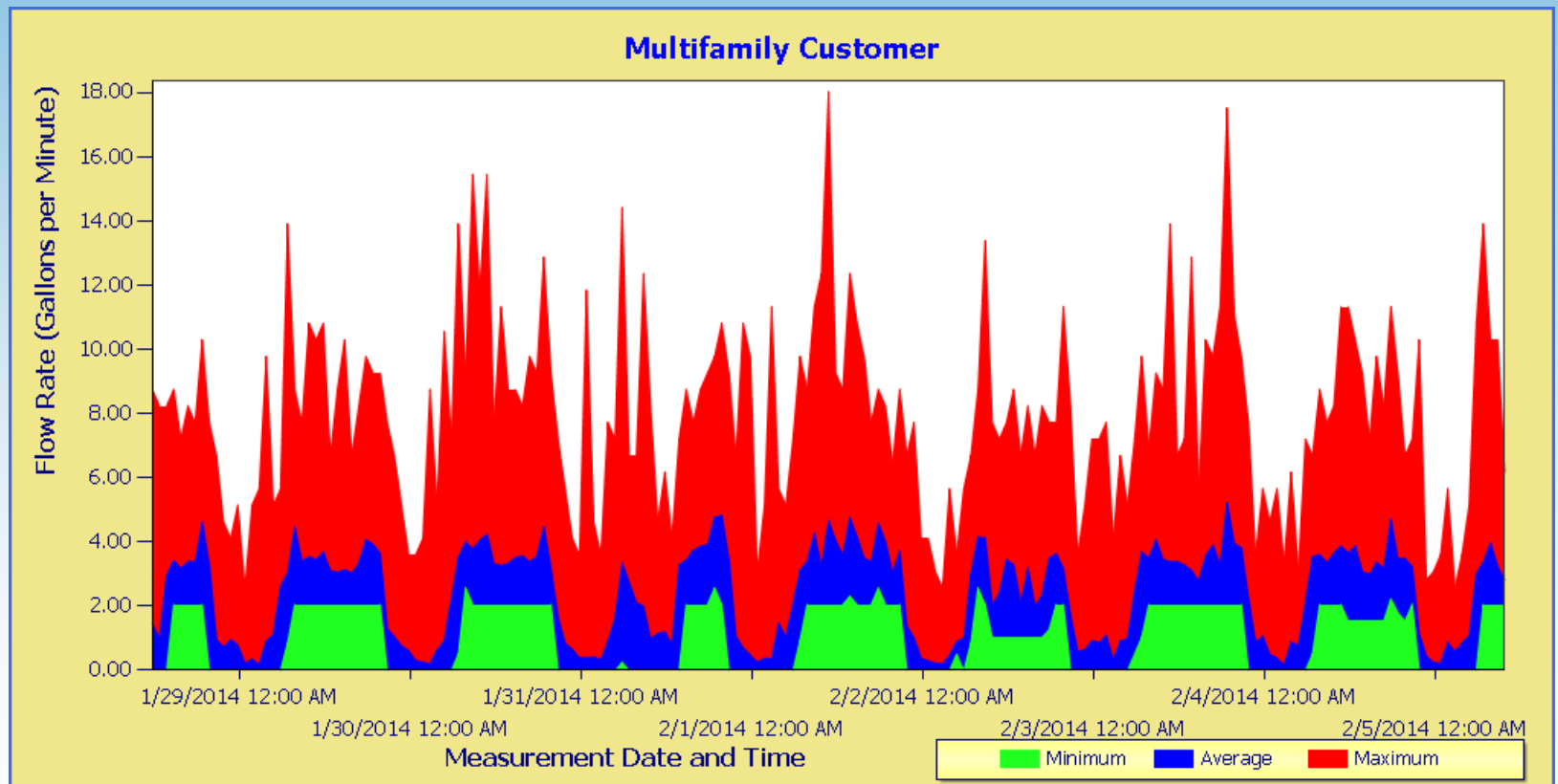
Behavior

- ~900 gpd
- ~1,300 gpd

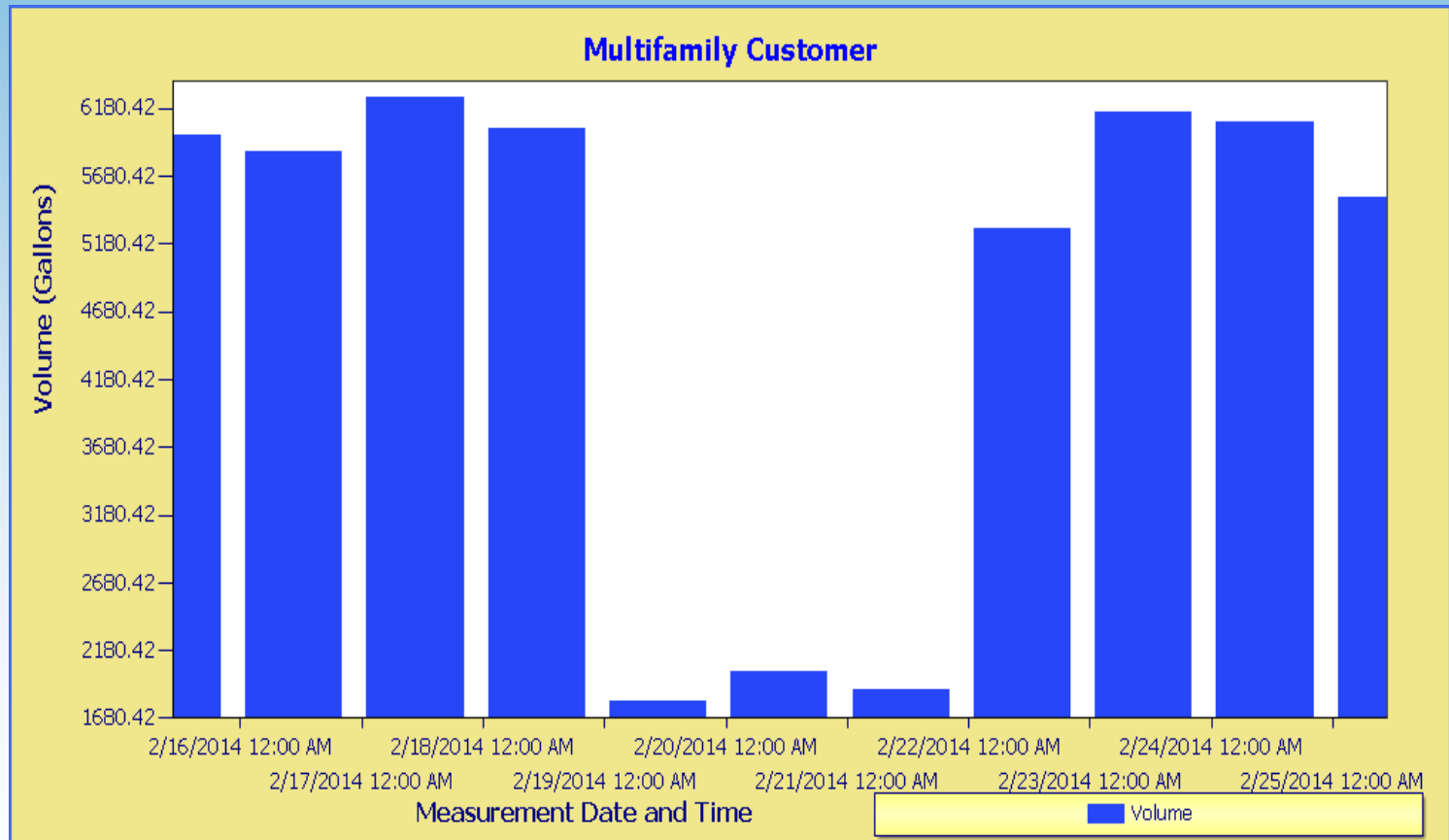




Behavior



Behavior



Water Security

