



Money Down the Drain: The True Value of Water

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Drip...drip...drip or in some cases gush...gush...gush. Do you know what that sound is? Money being poured down your drain! The true value of water is far greater than the H₂O molecules alone. In some cases, the true value of water can be as high as \$30 per 1,000 gallons! What you don't know about water can cost you plenty. What you learn about water can save you lots.

Water is a utility, and like electricity and natural gas, the more efficiently it is used, the more money that is saved. What is the true value of water though? Is it simply the value paid to the city for their "city water"? Is it only the pumping costs for well water? The answer to these last two questions is "NO!" What else adds value to every drop of water used? You are about to find out.

Usage

It is entirely possible that a company has no idea how much water they are using. The water bill is received and goes directly to accounts payable. Perhaps multiple water bills are received, and they are never combined to determine the total bill. Sometimes the rate is expressed in cubic feet instead of gallons, which is confusing for some. It is not unusual to find that no one in a company is paying any attention to how much water is being used and how much wastewater is being generated. A mass balance of "water in" to "water out" has never been generated. Extra wastewater surcharges may also be ignored.

Why?

Why is water sometimes ignored? Water is cheap...or at least it used to be viewed that way. This view has been changing more and more each year. According to an article in WaterWorld, November 2005, the costs of water and wastewater combined rose an average of 5.3% in the last year. That is nearly twice the Consumer Price Index (CPI). The average price paid for water and wastewater is \$5.78 per thousand gallons. Some cities have rates as high as \$12.17 and some as low as \$1.76 per thousand gallons.



on the water and sewer bills received each month. The true value of water includes the following:

- Cost of water (e.g., city or well pumping costs)
- Cost of wastewater treatment (e.g., off-site or on-site)
- Surcharges for special pollutants (e.g., Biochemical Oxygen Demand, Chemical Oxygen Demand, etc.)
- Heat (e.g., condensate, boiler blowdown, fuel costs)
- Chemicals added to water (e.g., cooling tower chemistry, boiler chemistry, process chemistry)
- Pretreatment costs (e.g., softening, reverse osmosis, deionization, etc.)

How to Reduce True Water Costs

There are numerous ways to reduce true water costs. Methods can be operational, chemical, or mechanical in nature. In order to reduce water costs, one must know the systems.

Water Mass Balance: Know the “water in” to “water out.” If they don’t equal, find out why.

Energy Balance: Know what processes add or remove energy from water. Boilers add heat while chillers take heat away. Either way, it costs money to do this. Know what energy is being wasted down the drain.

Each piece of equipment is unique and has its own water saving potential. Examples include:

Boilers: Decrease the blowdown by supplying high purity water as makeup. Decrease blowdown by installing an automatic blowdown controller to keep boiler cycles steady. Decrease blowdown by increasing the condensate return. Decrease blowdown by changing to more effective boiler chemistry to increase cycles.

Cooling Towers: Decrease blowdown by supplying higher quality makeup water such as softened water. Recycle water to the cooling tower such as reverse osmosis reject water or treated wastewater. Decrease blowdown by using more effective water chemistry to increase cycles. Decrease blowdown by installing a better blowdown controller. Convert once-through cooling applications to cooling towers.

Closed Loops: Reduce makeup demand by using effective corrosion inhibitors that will minimize leaks.

Wastewater: Reduce treatment costs by evaluating other chemistries. Reduce treatment costs by properly feeding chemistries (e.g., reduce flocculant sheer, fish eyes, inadequate mix time, etc.) Reduce sewer costs by finding

other uses for treated wastewater (e.g., wash tanks, cooling towers).

- **Process:** Cascade baths from clean to dirty to reduce makeup and sewer costs. Change water quality to extend bath life or eliminate equipment damage.

Fuel Costs

A cost that can easily be overlooked when calculating the true value of water is fuel cost. When dealing with boilers, the hidden heat energy value can easily dwarf the basic water/wastewater value seen on the water bills. Reducing boiler blowdown and increasing condensate return can have a significant effect on the bottom line of operating a boiler system. With today’s natural gas prices of around \$12.50/MCF, the cost can be significant.



Example: Condensate Return

As shown in the [November 2004](#) issue of this newsletter, the value of condensate can easily be \$16.81 per 1,000 gallons. This includes the cost of water, wastewater, pretreatment, and boiler fuel. Adjusting this price with the modern day water/wastewater and fuel costs brings this number to \$30.31 per 1,000 gallons.



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This is **5.2 times** more than the \$5.78 per 1,000 gallons for the water/wastewater alone. Wow! Knowing the true value of condensate can turn a project to increase condensate return with a five-year simple return on investment into a one-year return.

Conclusions

As shown, the true value of water cannot be ignored and must be considered when evaluating the economic health of any operation. With knowledge of water and the systems, water usage can be economically fine tuned to save money today and tomorrow. For more information on water saving opportunities at your facility, contact your local Water Management Specialist.



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