Water, Energy and Resources Reduction Projects

SOUTHERN NEVADA WATER AUTHORITY® Water Efficient Technologies

Laundry Water Reduction Through Reclaim & Reuse

Simple reclamation and reuse:
Often as simple as capturing rinse waters for process reuse. Later these waters are reapplied elsewhere in the process; as makeup or pre-wetting at another stage of the laundry. Because the water has been exposed to the laundry it is no longer potable and must be treated accordingly. Storage pits, pumps, tankage, filtration, disinfection and sanitation are all required:

Case 1)
Products = Table Linens, Bar Towels, Floor Mats
Estimated Savings: 6,994,107 Gallons per Year
Case 2)
Products = ALL; Sheet Goods & Bedding, Guest towels, Table Linens, Bar Towels and Floor Mats.
Estimated Savings: 19,600,000 Gallons per Year
Case 3)
Products = High-end & Luxury Resort Products: Spa Robes, Guest Towels, Sheet Goods, Bedding.
Estimated Savings: 12,585,457 Gallons per Year

Tertiary reduction:
Process heat reclamation
A large laundry also uses a lot of "air." Pneumatic actuators and solenoids are common in the process machinery: In this case a 250 Hp water cooled compressor provides it. Because of the possibility of oil contamination in the cooling water; it is unusable (directly) in the laundry, and was hence routed to a floor drain and the sanitary sewer. Though the usual load is about 15,450,000 BTU per day; waste-heat of over 71,000,000 BTU's per day* could also go with the water…
A closed loop glycol system with a heat exchanger and an auxiliary heat exchanging cooling tower were fitted. The tower was sized *at full compressor load, for the possibility of heat recovery exchanger failure. The system recovers over 643,000 BTU per day.
Estimated Savings: 5,675,966 Gallons per Year

Laundry Water Reduction

Advanced reclamation:
Energy recovery and water reuse
Hot, higher energy waters are captured for re-use, energy is recovered and transferred to other processes via heat exchangers. Waters then enter various pits for further processing: Primary filtration by shaker screens, advanced oxidation (usually by ozonation) further filtration to sub micron level, and additional disinfection (usually with UV light) before distribution back within the laundry system.
Estimated Savings: 88,962,195 Gallons per Year

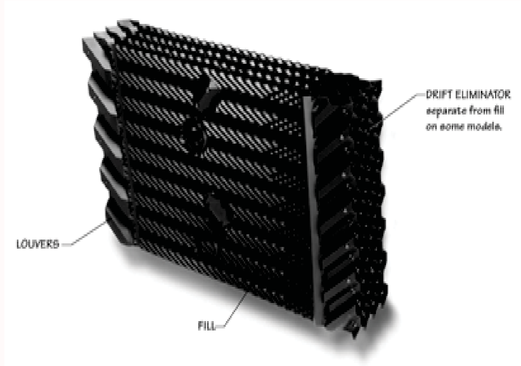
Evaporative Cooling Towers

Water Reduction with Concentration Ratio
(CR) Improvements is the most often used water conservation improvement for evaporative cooling towers. Its use in Southern Nevada is somewhat limited by water quality and return flow credit issues: The initial water quality; hardness, typical scaling components and Total Dissolved Solids, makes for several management problems. Accordingly, the SNWA has limited the programs limit on CR to 5. Facilities participating in the program have on average went from a CR of 2.22 up to 3.45.
This represents an annual water savings of 673,760 Gallons per Year Per 100 tons of Cooling capacity.

Evaporative Cooling Towers

Drift Reduction:
High-efficiency "drift elimination" technology incorporated into the evaporative cooling towers "fill" package: Can decrease 'drift losses' by 40 to 100 times… It is an unusual conservation initiative as most conservationists focus on reducing blow-down.
But here in Southern Nevada, it conserves our premium value consumptive use water. These technologies can reduce the initial drift rates, of 0.2 to 0.05% of circulating water, down to 0.005 to 0.002% of circulating water. **A typical project can save 1.35 GpM per 1000 tons of cooling capacity…**
Estimated Savings: For the average facility visited, this would equate to an average savings of 1,866,093 gallons annually.

Drift Eliminator Section with Integrated Fill



Water Reduction by elimination:
Replace an outmoded cooling system…
Air conditioning refrigeration systems have gained efficiency over the last 30 to 40 years.
Eliminating older water cooled systems, along with their higher maintenance profile can save water too:
Case 1) Medical Office Suites
Existing equipment: 200 tons cooling capacity @ (2) counter flow towers: Replacement equipment: 200 tons cooling capacity @ (4) 50 ton air cooled condenser models:
Estimated Savings: 4,200,596 Gallons per Year
(2,384,122 gallons as Consumptive Use)
Case 2) Bank Branch location
Existing equipment: 40 tons cooling capacity @ (1) counter flow tower: Replacement equipment: 30 tons cooling capacity @ (1) air cooled condenser model:
Estimated Savings: 840,119 Gallons per Year
(476,824 gallons as Consumptive Use)

Bottling Plant

Reduction via Process Changes:
Bottling plants often use a bottle rinser to assure that no dust, grit and manufacturing residue are present in the bottles used for their product. Replacement of water rinses with ionized air jets can eliminate most of this use.
Estimated Savings: 7,974,720 GpY

Reuse water Bottle Rinser effluents
for partial Cooling Tower make-up.
After eliminating most of the water rinsers, the remaining bottle rinser effluents were captured in a sump, and pumped through an additional piping system to the cooling tower. This highly purified (de-ionized) water is nearly ideal for cooling tower make-up water.
Estimated Savings: 4,369,050 GpY

Future / Ongoing Projects:

Power Plant Cooling Water Reduction
Newer higher efficiency systems; Reverse Osmosis (RO) with on-site regeneration of the media, Multi-Media filtration, demineralization system; and higher cooling tower operating cycles will save water at this facility. Located about 25 miles southeast of the Las Vegas, this facilities water is considered consumptive use.
Estimated Savings: 20,000,000 GpY

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