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Cranston Print Works Co.

Water Conservation Case Study

Water Conservation Team Effort Leads to Savings

Summary

Cranston Print Works Co. (CPW), an employee-owned company, achieved annual savings of over 110 million gallons of water and over \$350,000 from the implementation of 25 water conservation projects. These savings are attributed to the CPW's Water Conservation Team, which was formed in response to the company's commitment to continuous quality improvement.

Background

The Webster, Massachusetts division of Cranston Print Works Co. (CPW) prepares, prints, and finishes cotton and blended fabrics for the craft, home sewing, and interior decorating markets. The facility operates three shifts per day, 5-6 days per week, and employs 340 people. Reducing the company's impact on the local environment is an integral part of CPW's commitment to continuous quality improvement. In 1992, CPW installed a jet aeration system with injected liquid carbon dioxide to replace the two 4,300 gallon holding tanks in which wastewater neutralization had previously taken place. The carbon dioxide system eliminated the need for 2.66 million pounds of sulfuric acid a year. The payback period for the carbon dioxide system was less than 1.5 years and saves the company approximately \$80,000 per year in chemical purchase and maintenance costs. The Massachusetts Audubon Society, the Worcester Business Journal, and the American Textile Manufacturers Institute have recognized CPW for its environmental achievements.

Water Conservation

Building on CPW's success with toxics use reduction, employees formed a Water Conservation Team ("the Team") in 1995 to investigate opportunities to reduce water usage in all of the plant's processes. The Team is made up of 5-8 employees from various production and staff areas, and is integral to CPW's vision of continuous improvement and respect for the environment in all decisions. Since its formation, the Team has implemented 25 projects that have reduced the wastewater generated by the fabric preparation, printing, and finishing stages. CPW estimates that these projects have cut its annual wastewater generation by greater than 110 million gallons.

One example of a process that the Team identified as an area where significant water and energy savings could be achieved was the development and installation of a water recycling system in the white framing process (WFP). The WFP removes the lint, straightens the fibers, and adjusts the fabric to the correct width before it is sent to printing. Originally, the fabric was rinsed in a high-pressure washer with the lint-laden effluent discharged as process wastewater, and, when in full production, consumed 40 gallons per minute of fresh water heated to 110° F. Removing the lint from the effluent was the main obstacle to reusing the water for washing the fabric. The Team evaluated several options and decided that a vibrating screen filter was the most practical. In June of 2000, the CPW implemented the WFP water

recycling system. The effluent from the high-pressure washer is now pumped through a vibrating screen filter to remove the lint and the filtered water is pumped to a storage tank that feeds the washer. The storage tank has a closed steam coil to keep the water heated at the proper temperature. To prevent the concentration of impurities, a timed drain cycle purges about 50 gallons once per hour and a level control system adds make-up water to the tank when needed.

Since the WFP water recycling system was first implemented in June of 2000, the process underwent several improvements to properly size the screen mesh and determine the make-up water rate for the storage tank. CPW estimates that this project has cut wastewater generation by 8.9 million gallons per year. The equipment and installation for the WFP water recycling system cost \$15,000. CPW estimates annual savings from the water recycling at \$29,000 per year, which translates to a payback period of about six months.

Results

Reductions:

CPW reduced the amount of wastewater generated per wet yard of fabric processed from 1.2 gallons in 1996 to 0.7 gallons in 2002. This reduction is reflected in the cumulative reduction in water usage from all 25 water conservation projects to more than 110 million gallons per year. Individual savings from some of the key water conservation projects are listed in Table 1.

Economics:

About 90% of CPW's cost savings are from avoided sewer charges from the local publicly owned treatment works (POTW), with the remainder from energy savings. Overall, water use reduction efforts resulted in savings of more than \$350,000 per year.

Table 1. Wastewater volume and cost* reductions for various water conservation projects

Project description	Reduction (MGY)**	Savings
Installed vibrating screen filter and closed loop system on white framing process	8.9	\$29,000
Installed closed loop system on cooling water for rope range singer	8.3	\$26,211
Installed flow timer on print machine rag cleaner	6.0	\$18,948
Print machines: installed flow restrictors on fresh water make-up system	12.0	\$37,896
Print machines: all 6 machines converted to 100% recycled water	3.7	\$11,685
Print machines: replaced manual screen cleaning with automated filtration	13.1	\$41,370
Scrubber: reuse steam from aging process as water in bleaching process	4.6	\$14,527

*Figures do not include energy cost savings

** MGY: million gallons per year

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