

tissue in the desert

SCA Flagstaff, Arizona works with the community to conserve water and preserve jobs

By Monica Shaw

Getting down to the basics, tissue is simply made of fiber and water. So, how does a mill cope when access to one of these essential elements is threatened?

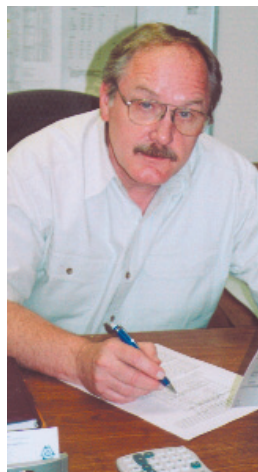
At SCA Tissue North America's mill in Flagstaff, Arizona, obtaining high-quality wastepaper for its recycled tissue and towel products presents less of a challenge than gaining access to a stable water supply. Like many mills, especially those on North America's West Coast, the Flagstaff facility must compete with a fiber-hungry Chinese market for recovered paper. But unlike many, the mill must also cope with water supply issues in its high desert climate that have only been compounded by a severe, six-year drought with no end in sight.

One need only examine a map to see the issues SCA faces in Arizona, where water sources are scarce - and now stressed - and only two mills exist. The Flagstaff mill is also in close proximity to a tourism-driven, environmentally sensitive area where US national treasures such as the Grand Canyon are located.

Prior to this January, the mill was using drinking water from the City of Flagstaff as its primary source of water, having cut its use to 2,000 gallons/ton (8,250 L/tonne) of paper produced through stringent conservation efforts and additional clarification units that support water reuse internally. Still, this was not enough to guarantee long-term water access - and mill viability - as the drought worsened.

Eager to preserve well-paying manufacturing jobs, the Greater Flagstaff Economic Council (GFEC) and the city authorities approached SCA about using reclaimed water. The mill decided to evaluate this alternative water source with a trial project. The successful venture has led to installation of a permanent pipe that sends water to the SCA mill. Not only has the project been an environmental and community success, it has shown SCA's commitment to away-from-home (AFH) markets on the West Coast.

"At Flagstaff, we use advanced manufacturing technology to achieve sound environmental practice, good community stewardship, and top-notch product quality,"



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WHY THE DESERT?

The Flagstaff mill was founded in the 1930s as an egg carton plant, but switched to producing recycled tissue grades in the 1970s when the No. 5 paper machine was purchased. It has had a variety of owners, including Wisconsin Tissue, Chesapeake, Georgia-Pacific, and, finally, SCA.

Two tissue machines are in service at the mill. The No. 5 machine, a wet-crepe machine, makes napkin and towel products, while the No. 6, a dry crepe machine installed in 1990, makes toilet tissue and napkin products. Both machines trim at around 130-in. (3.3 m), and their jumbo rolls are converted at SCA's Bellemont facility about 15 miles (24 km) away. Paperloop Benchmarking Services estimates the combined capacity of the two machines to be 130 finished short tons (118 tonnes)/day.

Coronet and Main Street are some of the AFH tissue brands produced at Flagstaff, while Tork and Park Avenue represent towel grades. The products are mainly distributed in California, Arizona, and New Mexico, but recent production increases have given the mill inroads into markets in the northwestern US.

The production increases are a result of various capital projects, including new drives on the No. 5 tissue machine in 1998. The No. 6 machine was also upgraded with a new 12-ft (3.65 m) Yankee and new headbox in 1997.

A more recent upgrade was the installation of a new 12-ft Yankee dryer with a 900° F (482° C) hood on the No. 5 tissue machine last year. This multi-million dollar project increased production by 15% on that machine, and combined with a new rewinder at Bellemont, it also showed SCA's commitment to the mill, according to Western operations director, Jerry Woodward.

"SCA has been very supportive of our mill, but we've also given them a good return on their investments," says Woodward. "SCA wants to be number one in the away-

from-home business, and our mill is very close to California, so we are a strategic fit from a regional perspective."

The Flagstaff mill is proud of producing an extremely clean sheet as a result of proprietary cleaning methods and its use of high-quality pre-consumer wastepaper grades. This sheet quality is demand driven. While the West Coast population is known for supporting environmental causes, both from conviction and from necessity as in the case of water curtailment, those same customers also want an appealing product.

"Our customers insist on a high-quality, white sheet," explains Chris Rimington, plant engineer and 30-year veteran of the mill. "They won't purchase very low grades of tissue products."

With a high-quality sheet, access to strong markets, low water consumption, and the ability to generate returns, Flagstaff mill had a great argument for continuing to operate in the desert, explains Woodward. However, as the drought dragged on, even low water consumption was becoming too high.

CITY PROPOSES ALTERNATIVE

By 2003, drought conditions had closed many wells, causing the City of Flagstaff to expand already strict conservation efforts. Manufacturing makes up only about 6% of the local economy, and SCA, which employs 250 people, was one of the top five manufacturing employers in Greater Flagstaff, which has a population of 85,000.

But SCA was also the largest industrial user of the scarce drinking water, using 250,000 gal/day (950,000 L/day). That amount was enough to support 1,850 residents, according to Flagstaff Mayor, Joseph Donaldson. The City had approached SCA in the past about using reclaimed water, but the benefits did not initially appear to outweigh the risks, says Woodward.

"We always thought reclaimed water would have a negative impact, and while water resources weren't threatened, we steered clear of it," Woodward explains. "By 2000, water rates were going up, and it became evi-



Selections from the SCA Tissue North America range



"Our customers insist on a high-quality, white sheet," explains plant engineer, Chris Rimington

dent that it was only going to get worse. The City planned to limit fresh water use, and if you went above that, rates would go up tremendously. We realized that if we were going to keep the mill open and grow the company in Arizona, we had to look further at water conservation."

The grade of reclaimed water proposed by the City was A+. Undergoing a four-stage treatment process, it actually meets Arizona Department of Environmental Quality and US EPA (environmental protection agency) standards for drinking water, although it is mainly used for watering golf courses and university grounds in the Flagstaff area. Despite this level of purity, SCA decided to proceed carefully before a complete switchover.

PILOT TRIAL, TEMPORARY PROJECT

In June 2003, the mill sent water and fiber samples to Miami University of Ohio for trial runs on a pilot tissue machine. When two independent labs found no problems with the trial product quality, SCA decided to try reclaimed water in its papermaking process.

The next trial would be conducted by laying a temporary, above ground pipe between the mill and the Rio water treatment plant. The City of Flagstaff, Mayor Donaldson, and GFEC assisted by convincing property owners in the quarter mile (400m) between the mill and treatment plant to allow the pipe to cross their property. Donaldson reports that all parties were "extremely willing" when they heard of the mill's conservation efforts. Also, to make sure that drinking water was kept separate from reclaimed water, the mill had to install backflow preventers and to carefully label water piping.

Overall, SCA uses 250 gal/min (950 L/min) at the mill, 150 gal/min (570 L/min) of which is for the tissue machines. Woodward reports that in December 2003 the mill began using reclaimed water at a rate of 50 gal/min (190 L/min) on the tissue machines, and, within three weeks, 100% of the water used to make tissue was reclaimed.

"We vigorously tested both on-machine and end product parameters such as odor and appearance, and we found no virtually no difference between using the potable water and using the reclaimed," explains Woodward. "We didn't change our chemistry, and we didn't experience any runnability problems either."

There was only a small issue with more frequent shower plugging. "We just installed inline filters to eliminate the problem," says Woodward. Customers have reacted positively to products made with reclaimed water, he adds.

"We sent a statement to all of our customers as to



The temporary, above ground pipe stretches a quarter mile (400 m) from the city's treatment plant to the mill

what we were doing and provided documentation to show them the products had been tested and were safe," Woodward comments. "Much of our customer base is in the same area affected by the drought, so we hope to capitalize on that."

PERMANENT PIPE SUPPORTS MILL FUTURE

With the success of the trials, which cost the mill around \$115,000, SCA has decided to permanently switch to reclaimed water on the paper machines. While the boiler is still using drinking water, Rimington says that the mill is researching the possibility of switching it over as well.

The mill continues to monitor tissue machine microbial counts, volatile fatty acids, and other parameters that could affect end-product quality. It also keeps track of changes in end-product characteristics.

An innovative financing plan will support the installation of a permanent pipe to the Rio water treatment facility during the summer of 2004. In time, another pipe will be installed to take water from the mill back to the treatment plant. Total projected cost for both pipelines is about \$1 million, and Woodward reports that the first pipeline will help the mill save around \$100,000/yr on water costs. However, this cost saving is nothing compared to the long-term benefits for the mill and the community.

"Without a doubt, this project has good RoI, because the City will put in the pipeline and then we will pay it back by paying a higher rate for the reclaimed water," says Woodward. "This was a good move for both parties. The yearly savings aren't nearly as important when compared with keeping the mill operationally viable for years and being a leader in the community by doing something good for the environment," he believes.

Currently, the mill has to cut back on its use of reclaimed water due to high summer demand in the community. However, the second pipeline returning water from the mill to the treatment plant should help this situation, as should continued efforts at reducing water consumption.

"We continue to look for ways to use less water, and we are currently working on a way to close our water loop considerably," Woodward explains. "Water conservation efforts are ongoing in the same way that we continually look for ways to speed up the paper machines and ways to use lower grade furnish. That's life. That's how you stay competitive and increase stockholder profits." **TW**

Photos on-site at Flagstaff by Phil Pepe, Jr.