

A photograph showing three men in safety gear (hard hats, high-visibility vests, and work clothes) working at a sewer access point. One man is kneeling and operating a camera on a long pole that is being lowered into a circular opening in the ground. The other two men are standing and observing the process. The background shows some industrial equipment and a grassy area with fallen leaves.

From left, Alexander City sewer operators David Keel, Stanley Hill and William Hayes lower an Aries Pathfinder camera into a sewer line. (Photography by Kenneth Boone)

**FOCUS: SEWER**

# THE FOG IS LIFTING

Technology upgrades and targeted maintenance have helped Alexander City reduce SSOs by 50 percent over the past two years

*By Dan Heim*

Alexander City is located in central Alabama, midway between Birmingham and Montgomery. The Tallapoosa

River runs nearby and feeds Lake Martin, a major resource for recreation and fishing. With 440,000 acres of water and close to 750 miles of shoreline, it looks like a Norwegian fjord. Problems with I&I and SSOs could threaten its water quality, but the city hasn't let that happen.

They do get some rain — 58 inches annually. Aging infrastructure, mostly vitrified clay pipe, was creating additional problems with I&I. Excess discharge could make it into the waterways, and ultimately to the lake. Known for exceptional water quality, Lake Martin has been designated a "Treasured Alabama Lake." The city is committed to preserving this asset.

Gerard Brewer, P.E., and director of Public Works for the Alexander City Sewer Collection Department (ACSCD) notes, "We knew we had potential problems, and both Alabama Department of Environ-



**Alexander City Public Works  
Director and City Engineer  
Gerard Brewer.**

plete on that GIS now," says Brewer. "It's helping us tremendously by prioritizing what needs to be done."

Previously, smoke testing was the only method used to identify

**"We did have an existing grease ordinance, but it was a single paragraph, said nothing about grease traps, and was kind of vague. We had 50 different interpretations of what it meant. Our new ordinance is much more specific — and effective."**

**Gerard Brewer**

mental Management (ADEM) and EPA were watching closely to see how we handled it."

### Beginnings

ACSCD partnered with CH2M HILL, an environmental consulting firm, back in 2000. According to Scott Cummings, consulting engineer with CH2M, "One of the first things we recommended was a GIS. If you don't know what you have in the system, you can't really fix it." Cummings and CH2M associate Dana Raughton have been onboard at ACSCD advising them every step of the way.

"We're about 95 percent com-

pipe breaks or bad joints. Acquiring a truck-mounted Aries Pathfinder camera system, and Aries pole and push cameras, was another significant step forward. ACSCD has now inspected 40 percent of their pipe using CCTV. ITPipes software (Infrastructure Technologies) handles the data logging. Their plan is to inspect another 20 percent of their pipe each year.

"Until you actually look into those pipes, you have no idea where the problems are coming from," says Danny Pike, foreman of the SCD and jack-of-all-trades with camera systems. "We knew we had a FOG problem, but until we saw

## RECYCLING WASTE

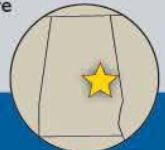
Alexander City runs two treatment plants. The Sugar Creek Plant (AWWTP) came first, and was designed to handle dyes and chemicals from local textile industries. With that industry in decline, the plant is currently running at only 60 percent capacity. Designed for 6 million mgd, primarily from the large textile plants, the load has gone to nearly zero. The textile plants have closed, reducing tax revenue and budgets. So Alexander City is aggressively seeking to attract new industry.

Coley Creek Plant (WWTP) handles the residential waste stream, and is designed to remove typical solids and organic components. It's a much smaller plant. Solids from this facility are trucked to Sugar Creek, where they're combined for further processing.

The Sugar Creek Laboratory, a modest operation with two full-time employees adjacent to the Sugar Creek Plant, is charged with monitoring the quality of effluent.

The real work goes down at the Sugar Creek Plant. There, polymers are added to bind the solids into sludge, which is then sent through a belt press to squeeze out most of the water. What's left is solid cake. That cake is trucked to several permitted sites where it's spread for final drying.

These sites use the cake, which is rich in nitrogen, phosphorus and organic compounds, to condition the soil for growing straw and hay used by local cattle ranches. One or two truckloads of cake are delivered each day. The entire process is closely regulated by the ADEM and the EPA, monitored for application limits and chemical content, and is subject to more stringent constraints than commercial fertilizers. Storage of cake at the plant is necessary, since it cannot be applied during the wet season.



### PROFILE:

## Alexander City (Ala.) Sewer Collection Department

**SERVICE AREA:**  
25.8 square miles

**CUSTOMERS:**  
5,821 residential,  
1,380 commercial

**POPULATION DENSITY:**  
387 per square mile

**INFRASTRUCTURE:**  
150 miles of 8 to 30 inch gravity mains, a mix of vitrified clay, PVC, concrete and ductile iron; 5,000 manholes; 21 lift stations; two treatment plants; one AWWTP, one WWTP rated

**ANNUAL BUDGET:**  
\$577,000 operational,  
\$800,000 capital

**EMPLOYEES:**  
11 full-time workers

**AVERAGE RAINFALL:**  
55-60 inches per year

**WEBSITE:**  
[www.alexandercityonline.com/waste.html](http://www.alexandercityonline.com/waste.html)

how much had settled into low pipe sections, we didn't appreciate the extent of the problem. Now we can also see breaks, bad joints and root intrusions."

Brewer notes enacting a grease ordinance and installing grease traps at 54 food service facilities played a big role in solving the FOG problem. "That's where 65 percent of our SSOs were coming from. We've also inspected and cleaned about 40 percent of our pipe. Together, that's eliminated 50 percent of our SSOs.

"We did have an existing grease ordinance, but it was a single paragraph, said nothing about grease traps, and was kind of vague. We had 50 different interpretations of what it meant," Brewer says. "Our new ordinance is much more specific — and effective."

Superintendent Mike Waldrop says root intrusion in this heavily



**ABOVE:** The Alexander City team includes, from left, Public Works Director and City Engineer Gerard Brewer, Shelby Richardson, William Hayes, Leroy Thornton, Danny Pike, David Keel, Stanley Hill and Mike Waldrop. **LEFT:** From left, Hayes, Pike, Thornton and Keel use a vacuum system to remove debris and solids from a sewer line.



wooded area was another significant source of I&I. “When you have roots, they will find the water. So we need a pretty aggressive program,” he says. “That includes keeping trees and shrubs out of our easements, cutting and trimming as needed with Bush Hogs, and using chemicals to kill back the roots. It’s a daily job, and we track all this work on our GIS.”

High groundwater levels, averaging 7 feet, and several streams also exacerbated I&I. The city’s 5,000 manholes, mostly constructed of brick and mortar, didn’t help. Many of those have already been inspected and rehabilitated using a cementitious mix brushed on from the inside.

#### **Current efforts**

The Middle Tallapoosa Clean Water Partnership (MTCWP) is a local, privately funded environmental group. It’s a consortium of stake-holders that includes industry, civic organizations and educators. Their mission: oversee all aspects

of the Tallapoosa watershed.

“We’ve got a lot of eyes on how our system affects the water quality. But the partnership also gives us a platform for educating residents about how to protect that watershed,” Brewer says. “We do everything from advertising to water festivals to ‘state of the watershed’ meetings.”

Local schools are also involved with environmental education. MTCWP provides grants for teachers to fund student projects addressing water quality. They also act as a clearinghouse for information about rain barrels, rain gardens, and what not to put down your drain.

“Alexander City is not required to have a formal stormwater program, but the city makes use of the partnership to promote preservation of water quality throughout the basin,” says Cummings. Partnerships like that, during economic downturns and reduced budgets, allow the city to cut back as needed but still get the job done.

Rehab efforts on the system’s

pipes are ongoing, and ACSCD is three years into their pipe replacement program. They know much of their pipe is nearing the end of its 50-year average lifetime, so they've been inspecting 2 percent of that pipe each year for several years. They're also on the verge of some large construction projects, and with a capital budget of \$800,000 per year, Brewer thinks they'll be able to get where they need to be.

"We're moving to PVC for those pipes, replacing the vitrified clay so popular back in the 60s and 70s," says Pike. "When we televised that stuff, we found lots of bad joints and cracks. It's pretty easy to break clay pipes."

Replacing or rehabbing that pipe was a high priority, and officials identified it as among the city's top 10 sources of I&I. The worst 40 percent of that pipe was addressed in the first two years of the program.

### Working smarter

Technology upgrades have allowed ACSCD to work smarter and more efficiently, and Brewer and Pike can cite several examples.

"Back when we were just smoke testing, we did the best we could with that simple tool. Our motto is 'find it, flag it, fix it.' But once we added GIS, we

**"Until you actually look into those pipes, you have no idea where the problems are coming from. We knew we had a FOG problem, but until we saw how much had settled into low pipe sections, we didn't appreciate the extent of the problem."**

Danny Pike

found we were making redundant spot repairs and not using our resources to best gain," Brewer says. "The spatial element of GIS let us see many problems we'd been missing. Now we can get the whole picture."

Pike adds that when they made the move to CCTV and actually started looking into those pipes, they found a lot of things that never showed up with smoke testing, including sagging lines where grease had built up, offset joints and root intrusions. It was an eye-opening experience.

"It was that video of our pipes that really got the mayor and City Council behind our efforts," Brewer says. "They could see the extent of our problem with their own eyes. It seems funny now, but they watched that video during a lunch meeting. As you might expect, sewer videos and lunch at the same time can make a big impact."

As a result, the City Council is fully behind ACSCD's efforts. They understand the scope of the problem, appreciate the engineering challenges, and are backing ACSCD to the extent the budget allows. "That's really helped us do our job," Brewer says. "It's more 'glamorous' for them to fund highly visible projects, say, ball fields or parks. But they understand the importance of this essential and invisible infrastructure."

### Down the pike

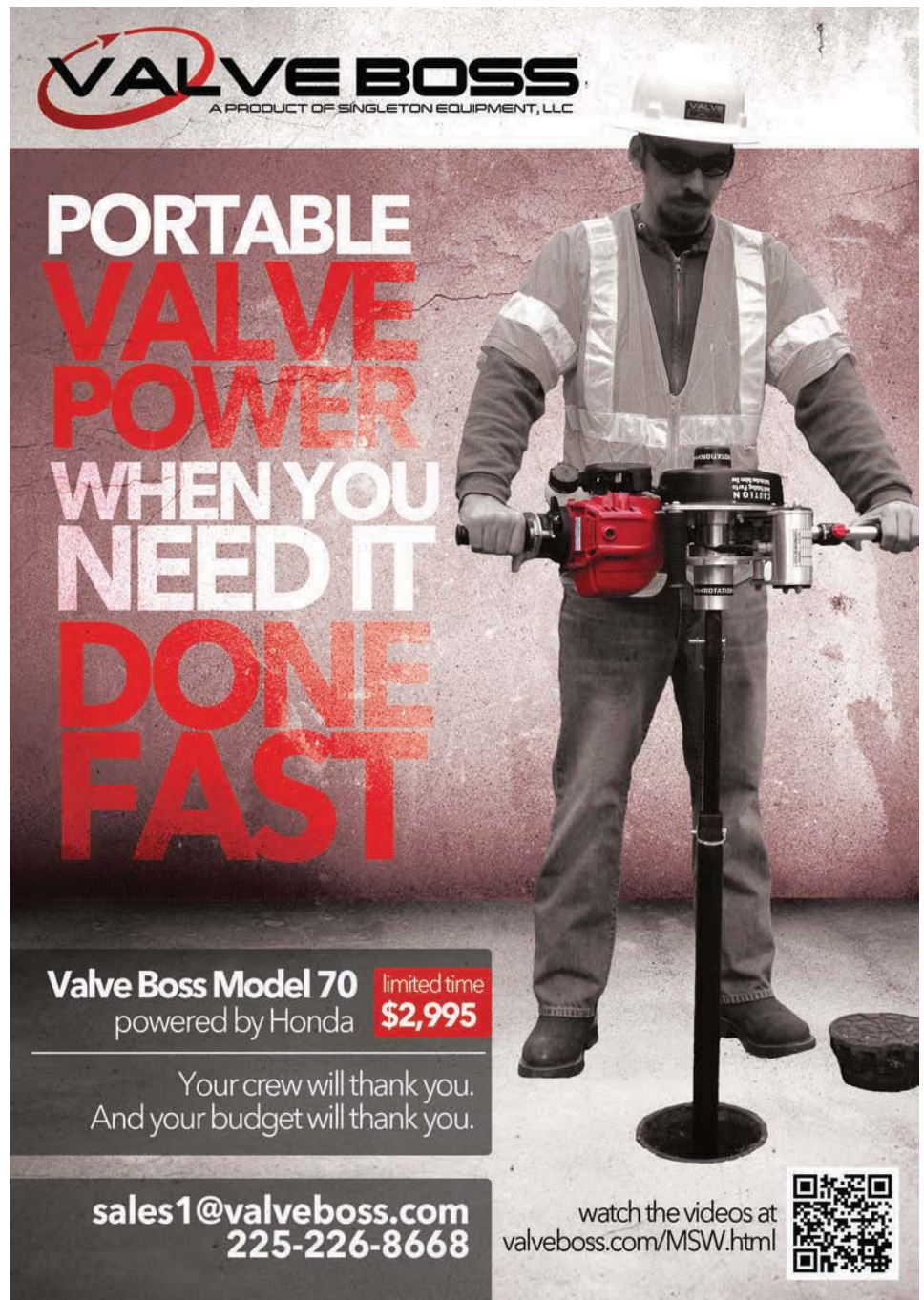
"One of the things I think we're doing right, and supported by our politicians, is doing what we can in-house, but subcontracting certain types of work to local contractors. That includes things like

spot repairs and full line replacement," Brewer says. "Keeping that money in our local economy is important. We sometimes go out-of-state if special equipment or methods are needed, but we really try to do all we can right here."

With most of the textile industry now offshore, Alexander City has begun an aggressive program to attract new industry, build their tax base, and increase local jobs. The city, by using attractive tax structures, has been successful in attracting new industry from the automotive sector. Honda, Hyundai and Kia are already in the area are with parts assembly plants and associated support industries.

In the meantime, ACSCD will continue doing what they do best.

"One thing we've learned is to recognize where our strengths and abilities are, and to leverage those skills," Brewer says. "Danny [Pike] and Mike [Waldrop] have done a tremendous job with our CCTV program. That's already helped solve a lot of our problems. Good managers need to



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Leroy Thornton looks at a closed-circuit-video feed of a sewer line from inside the Aries CCTV truck.



**“We’ve stayed on top of things, avoided consent orders, and believe we have a long-term strategy that works. We know we won’t be able to fix everything next year, but we’re making great progress. We’ve stayed within our budget, and are proud of what we’ve done so far.”**

Scott Cummings

recognize and reward skills like that. In terms of technology, we went from being novices to as good as or better than most in the business.”

ACSCD has been doing their work totally on self-generated revenue. There’s been no bonds, grants or rate increases. That’s crucial for keeping customers and politicians happy. It’s being done with good management and dedicated employees who feel appreciated.

“We’ve stayed on top of things, avoided consent orders, and believe we have a long-term strategy that works,” Cummings says. “We know we won’t be able to fix everything next year, but we’re making great progress. We’ve stayed within our budget, and are proud of what we’ve done so far.”

Brewer notes the utility has a group of employees who have close to 100 years total experience in the business. “We’re like a family. And we’ve all taken it upon ourselves to learn how to use this new technology, fix our own equipment, and stay up to date with the software.

“I can’t emphasize enough what technology has done for our program. A large part of that is GIS, CCTV and the Cityworks software package. It’s all integrated. You can’t manage what you can’t see.” ♦

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