

## FOCUS: SEWER

# COMPLIANCE THROUGH INNOVATION

Clean Water Services keeps in step with strict regulations by allocating the right equipment to the job and encouraging team members to contribute ideas

By Peter Kenter

**I**t's a challenge servicing sanitary and storm sewer systems in a county comprising 616 square miles with a population of half a million.

That's especially true in a Pacific Northwest state with strict environmental regulations, and when wastewater effluent discharges to the county's only river, which is also the major local supply of drinking water.

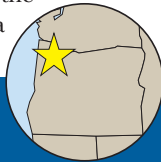
Clean Water Services tackles that challenge in Washington County, Ore. CWS is a water resource management utility established in 1970 to consolidate the water and wastewater services of a dozen communities. It has diverse responsibilities that in addition to wastewater and stormwater include flood management, water quality and stream enhancement projects, street sweeping, and fish habitat protection.

Strict attention to environmental regulations is paramount, but CWS finds that superior results are best achieved by giving team members the latitude to adopt innovative policies and to select the technology that best suits the job.

Dane Smith, purchasing and fleet coordinator, and Ted Claussen,

maintenance supervisor, have logged 32 years apiece with CWS. "Dane started in April, and I started in June," jokes Claussen. "He'll go before I do."

They describe the CWS service area



**PROFILE:**  
Clean Water Services, Washington County, Ore.

**FOUNDED:**  
1970

**POPULATION SERVED:**  
500,000

**AREA SERVED:**  
616 square miles

**EMPLOYEES:**  
300

**INFRASTRUCTURE:**  
800 miles of sanitary sewer lines, 470 miles of stormwater lines

**ANNUAL BUDGET:**  
\$48 million (operations)

**WEB SITE:**  
[www.cleanwaterservices.org](http://www.cleanwaterservices.org)

Crew lead Adam Werner and field construction maintenance technician II Pat Romane clean one of Clean Water Services' nearly 14,000 catch basins, which are serviced every year. (Photography by Bryan Welsh)







Members of the Clean Water Services maintenance team include, from left, purchasing and fleet coordinator Dane Smith, maintenance supervisor Ted Claussen, field construction maintenance technician II Jim Stahly, crew lead Bob Sorenson, field construction maintenance technician II Pat Romane (on step), and crew lead Adam Werner (in truck).

“Most of the sanitary lines are in good shape, with tight joints,” says Claussen. “We try and clean the sanitary system once every three years. I prefer to keep it closer to 24 months, and we’ve been meeting that goal significantly during the past four years.”

### Basin by basin

The system is divided into basins and sub-basins. The sanitary sewer system comprises three basins and 115 sub-basins. The lines are also regularly hydroflushed with the Aquatech units, and the entire system is inspected every seven to eight years. In-house crews carry out much of the repair work.

“They’re capable of virtually every kind of repair,” says Claussen. “A lot of it is old school dig-and-replace, because we don’t get a lot of freezing weather here — maybe two weeks out of the year.” The county also owns pipe burst-



General Equipment Company built a lazy Susan holder for sections of vacuum tube on Clean Water Services’ Aquatech combination trucks.

stormwater system clean and televised is a CWS priority. At the county’s disposal is a fleet of combination trucks, waterjetters and TV inspection vans.

The backbone of the maintenance fleet is a team of six Aquatech B-10 combination trucks and an Aquatech SJ1500 jetter, all from Hi-Vac Corp. Crews can also deploy two Model 800-H truck jetters from Sewer Equipment Co. of America.

Smith likes the versatility of the Aquatech units to service both sanitary and stormwater lines. “For our purposes and our budget, they give us the broadest service,” he says. “Our crews like the B-10 in particular because it has the hose reels on the rear bumper, which lets the operator maintain an upright position. They say it’s better for their backs and more ergonomically friendly.”

The department operates five TV vans, four from Aries Industries and one from Rausch Electronics USA.

The county has more than 800 miles of sanitary sewer lines and 39 lift stations feeding four treatment plants. The pipes are concrete except for about 5 percent PVC. It’s a relatively new system: roughly two-thirds has been installed since 1975.

as a puzzle. The utility must carefully allocate resources to each community — the largest is Hillsboro — and ensure that no activity in one community adversely affects the outcome in another. At the end of the day, success is measured by the health of the Tualatin River, a tributary of the Willamette River, where wastewater treatment plant effluent is released.

### Strict regulations

Keeping the county’s sewer and

## RECYCLING RIDES

Clean Water Services is committed to environmentally sound principles that include reuse and recycling. That extends even to the equipment fleet.

“We had a 1996 Aquatech SJ1500 jetter truck on a Freightliner chassis that we thought we’d like to keep around a little while longer,” says Dane Smith, purchasing and fleet coordinator. Crews often preferred the older model because its rear hatch covering the hose reel provided a shelter in rainy weather and its low profile made it easy to maneuver on county roads.

“In keeping with our recycling goals, we investigated refurbishing it instead of buying a new one,” says Smith. CWS budgeting rules gave Smith the freedom to allocate the cost of refurbishing the unit under the capital budget. The cost also fell below the threshold where a request for a proposal was required, making the process simpler than a new purchase.

“We sent the unit to the Hi-Vac dealer in Portland to be completely refitted and refurbished, from pumps to tank, and then had them put it back on the old chassis,” says Smith. “When it came back it was like a brand-new vehicle. The truck only has 100,000 miles on it, so we think we can get another 10 to 12 years out of it.”

Smith reckons the department saved about \$70,000, and he was so pleased with the results that he’s sending out a 1999 MT45 Freightliner TV inspection van to TEC Equipment of Portland for a makeover. Expected savings: \$40,000 to \$50,000.

“TV vans are ideal candidates for refurbishing because they’ve got such low mileage on them,” says Smith. “Driving at low speeds from manhole to manhole, this one has a heavy-duty chassis and only 45,000 miles on it. When we have it mechanically checked over and steam-cleaned, then put the cameras back in, we expect to get another dozen years out of it.”





Crew lead Bob Sorenson operates the easement machine built by KWMI Manufacturing. It allows crews to reach off-road manholes up to 800 feet from the truck, making it much easier to clean remote sewer lines.



Crew lead Bob Sorenson and field construction maintenance technician II Jim Stahly prepare for a pipe cleaning job.

ing units from Vermeer Corp. and TRIC Tools and a chemical grouting truck from Aries Industries. Outside contractors handle cured-in-place pipe lining for larger pipes 36 inches and up.

Stormwater management is critical because mountains surround the communities. “The water goes where it goes,” says Claussen. Heavy rains can cause flash flooding, but combined sewers are a distant memory. A series of smaller surge basins help collect excess rainfall, although occasional floods clog storm drains, necessitating midnight flush-and-vacuum operations.

“Heavy rains always seem to hit between midnight and two in the morning, when it’s hard to

find the drains in the dark,” notes Claussen. The stormwater system comprises about 470 miles of lines, including trunks and interceptors. The agency also maintains 13,500 catch basins, and 600 water quality manholes.

Like the sanitary system, the stormwater system is divided into basins and sub-basins. The stormwater system consists of four main basins and 65 sub-basins.

### No flushing

Only the Aquatech units are used for stormwater system maintenance, and only to clean and vacuum the system; jetting would raise sediment and flush it through the system instead of removing it.

“Our goal is to clean out 25 percent of the storm lines annually as a minimum goal, but we generally exceed that,” says Claussen.

“We clean all of the catch basins annually and all of the water quality manholes twice a year.”

Checking the water quality manholes is crucial, because they contain a baffle system that traps floatables, oil, grease and silt. The lines are generally televised after cleaning. “We like to get a nice clean shot of the lines as we leave them,” says Claussen.

CWS has taken on the duty of street sweeping because it directly affects the quality of stormwater. “In 1990, the surface water management program identified the amount of phosphates, oil and sediment coming in off the streets, so we adopted an aggressive street sweeping program,” says Claussen.

The sweepers use a regener-

ative air system, not mechanical brooms, to lift dirt from the streets. They’re limited to traveling at five miles per hour, and their progress is constantly monitored to ensure that the roads are clean.

“The sweepers may soon be outfitted with GPS to monitor their exact coverage, speed and hours of service,” says Claussen. “Our thinking is that the cheapest way to eliminate impurities is to sweep them up before they get into the system. We figure it costs four times as much to pull the dirt

out of the catch basins than to sweep it up.”

Claussen notes that once impurities descend below road level, the cost of dumping increases from next to nothing to almost \$80 a ton, because the debris is then classified as hazardous waste.

### Industries on board

Customers are educated about containing contaminants before they enter the system. Industrial clients are monitored and are required to report any contamination accidentally introduced into the system.

“We have on-site labs that go to the client to do sampling of the contaminants,” says Smith. “We can’t just wait at the treatment plant to identify what’s coming down the pipe.” Restaurants participate in a fats, oils and grease (FOG) program. Bacterial treatment of food grease at the retail level is discouraged because it can interfere with microbes in the wastewater treatment process.

Roots are a problem in both the sanitary and stormwater systems. The guilty parties here are primarily corkscrew willows and silver leaf maples. For pipes up to 12 inches, crews use hydraulic cutters to pulverize roots. “Anything above that, there’s too much pressure loss,” says Claussen. “We use chain cutters in the bigger lines.”

The department uses root foaming treatments in the sanitary sewer system, but such chemicals are not allowed in the stormwater system.

**“Our crews are pretty creative and we listen to their suggestions. We’re also given enough freedom within the rules to choose the best equipment for the job.”**

**Dane Smith**

### Innovative equipment

Innovation is part of the CWS culture. Crews are allowed to select specialized equipment to suit their needs. They use special easement machines (KWMI Manufacturing) to move hose reels long distances across properties and through the county’s many canyons.

“They’re powered by a gasoline engine and take the hose reels about 500 feet,” says Smith. “Then we have another 300 feet we can take off the reel from there. It allows us to send out one or two

people to those jobs, instead of the three or four required to carry the heavy water-filled hoses.”

The first set of easement machines bogged down in the mud, so the department ordered a new unit that crawls on a set of tank-like tracks.

One of the department’s own innovations on the combination trucks is a lazy Susan device affixed to the side for storing aluminum vacuum tubes upright instead of carrying them on the bumper, where they’re subject to damage. “General Equipment built the units for us to our specs,” says Smith. “Now the crews just spin the platter and turn the next pipe toward them as they take them off the truck.”

Complying with strict environmental regulations doesn’t require CWS to regulate and stifle innovation within the department, notes Smith. “Our crews are pretty creative and we listen to their suggestions,” he says. “We’re also given enough freedom within the rules to choose the best equipment for the job.” ♦

## MORE INFO:

**Aries Industries Inc.**  
800/234-7205  
[www.ariesindustries.com](http://www.ariesindustries.com)

**General Equipment Company**  
503/288-7447  
[www.general-equip.com](http://www.general-equip.com)

**Hi-Vac Corp./Aquatech**  
800/800-1016  
[www.hi-vac.com](http://www.hi-vac.com)

**KWMI Manufacturing**  
800/503-0076  
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**Rausch Electronics USA LLC**  
877/728-7241  
[www.rauschtv-usa.com](http://www.rauschtv-usa.com)

**Sewer Equipment Co. of America**  
800/323-1604  
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**TEC Equipment Inc.**  
800/525-6333  
[www.tectrucks.com](http://www.tectrucks.com)

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888/883-8742  
[www.trictools.com](http://www.trictools.com)

**Vermeer Corp.**  
888/837-6337  
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