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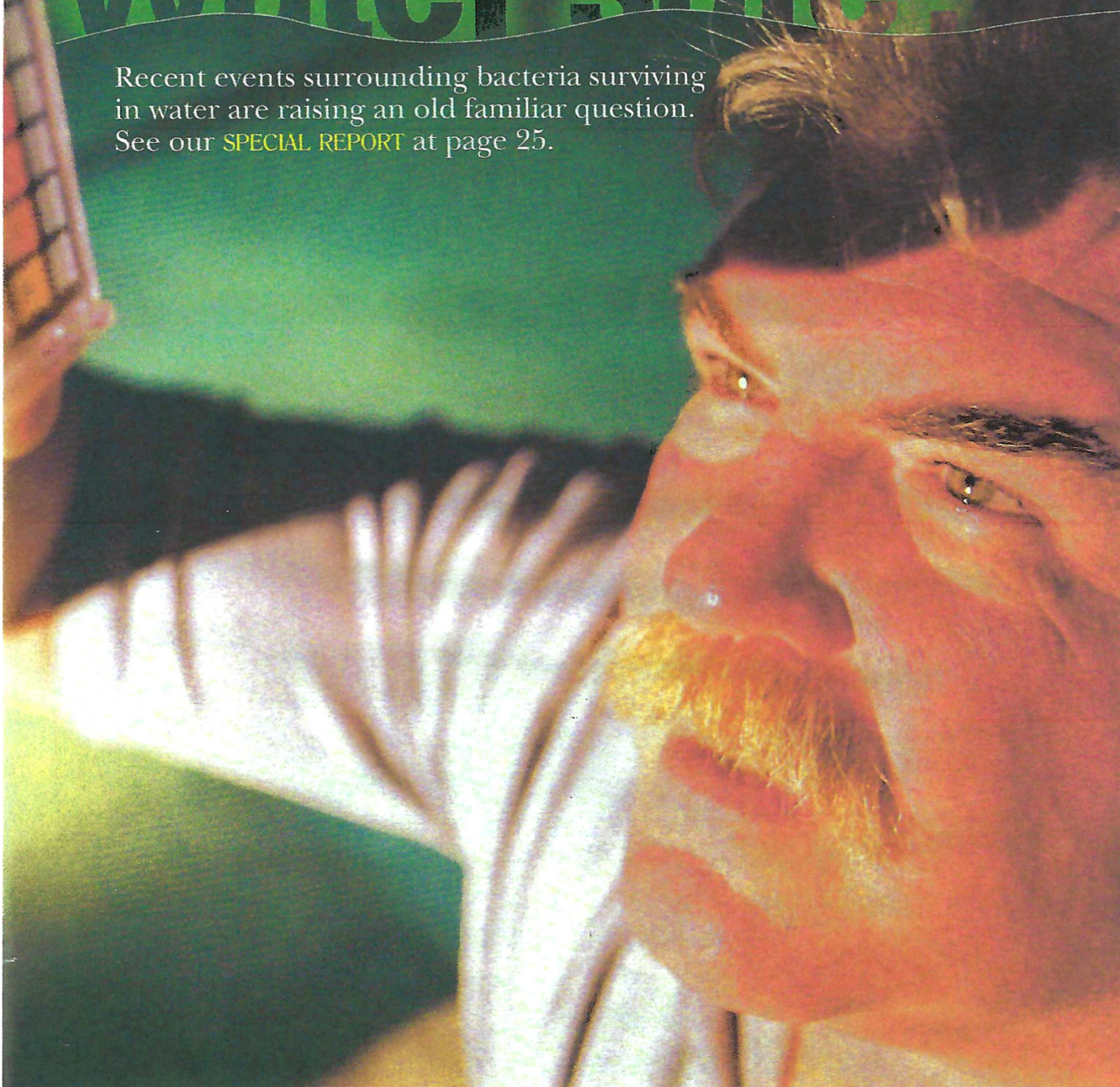
Swimming Pool/Spa Age **SPECIAL REPORT**

SWIMMING  
**POOL/SPA**  
AGE®

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# Is our water safe?

Recent events surrounding bacteria surviving in water are raising an old familiar question. See our **SPECIAL REPORT** at page 25.





As an industry reacts to one of its own causing an E. coli outbreak, waterpark officials say water quality is and will continue to be its greatest priority.

# On the waterpark

BY ERIC MINTON

A waterpark. Of all the headline-grabbing aspects of the E. coli outbreak linked to the White Water Marietta, Ga. waterpark in June — that the victims (at 25 and climbing) were children, that one was the son of an All-Star Atlanta Braves baseball player, that the particularly dangerous strain hospitalized most of the children, putting some in critical condition — the most newsworthy aspect was the setting.

A waterpark.

While E. coli outbreaks have been linked to community and commercial facilities in the past, this apparently is the first involving a waterpark. In its 18-year history, the World Waterpark Association (WWA) (Lenexa, Kan.) has never heard of such a case. And that's something considering these parks usually feature kiddie pools, wave pools, endless rivers and raft rides.

Noah's Ark, the nation's largest and one of the oldest waterparks (opened in 1979), has never experienced a case like this. In fact, Tim Gantz, president of Noah's Ark (Wisconsin Dells, Wis.), can't recall a bacteria epidemic among any of his colleagues or any of his competitors.

This two-decade incident-free streak wasn't just luck. To keep its water pristine, waterparks generally combine up-to-date and well-maintained equip-

ment, careful water chemistry, specially trained lifeguards and strictly enforced rules for its customers.

"Waterparks tend to do a better job," says Roy Martin, aquatics eastern regional manager for U.S. Filter (Bradley, Ill.), which sells automatic chlorination systems and has a large waterpark clientele. "The way they design their facilities, they have high turnover rates (water circulation).

"Most automate their facilities, and they tend to buy top-line equipment," he adds. "And they tend to participate in AFO (Aquatics Facility Operator) and CPO (Certified Pool Operators) certification courses, so the knowledge of people there, I believe, is higher than average pools."

It has to be. Accidents can cripple public trust. Need proof? The trade newspaper *Amusement Business* reported that White Water's attendance fell 30 percent after the E. coli incident.

## DOUBLING UP THE GUARDS

The key for White Water may rest in technology. Before the breakout, it was using automatic chlorination and had installed an electro-static precipitator three years ago. According to a White Water statement, after learning of its link to the E. coli outbreak, it purchased the Strantrol System5 from U.S. Filter. Park officials say the chlorination system will be used in every at-

Noah's Ark Waterpark in Wisconsin Dells, Wis. uses an automatic chlorination system by U.S. Filter (Bradley, Ill.).

traction in the park.

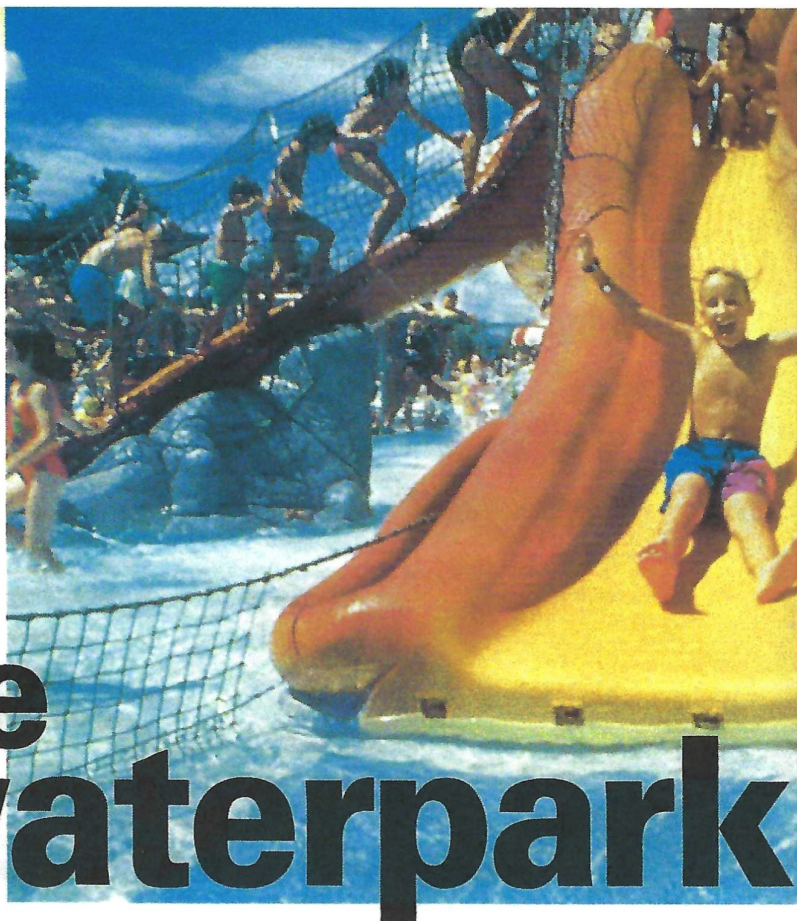
The System5 uses digital technology rather than analog because digital technology is more accurate. The system alerts operators via computer, phone, pager or aural alarm when oxidation reduction potential (ORP) or pH levels are too low or too high. Readings are taken continually at the weakest link in the pool.

System5 also compiles an ongoing detailed water analysis, which gives operators an overall review of water conditions at any point during the season.

"It can go down to a minute-by-minute play of what was occurring," Martin says. Such data would have more readily pinpointed what happened at White Water June 11 and 12.

According to a White Water statement following the incident, the park was "not satisfied with our manual record keeping. Our water quality staff are 16-year experts, but they aren't record-keepers.

This system frees them from documentation so that they can concentrate on their jobs, eliminates human error which can occur during very busy operational times, and provides hourly documentation every day, every hour. More than anything, it greatly exceeds the standard, and is





far more sophisticated than manual pool test kits."

Today, automated chlorination systems are becoming standard equipment for many waterparks. For example, Noah's Ark replaced its old systems with Strantrols over the past three years and uses the system on all new rides. The waterpark has 32 water slides, four kiddie play areas, two endless rivers and two wave pools.

The Beach (Mason, Ohio), which attracts some 350,000 guests from Memorial Day to Labor Day, has used Strantrol systems for 11 years. And Splashtown USA at Funtown USA Amusement Park (Saco, Maine), replaced all of its old automatic chlorinators in the past three years with equipment from Santa Barbara Control Systems (Santa Barbara, Calif.).

"We've replaced filters, pumps, the sand; we always put in new sand every year," says Kenneth Cormier, president/CEO/general manager of the 31-year-old Splashtown. "It's working better than ever since we've had it."

Waterparks use both automatic systems and manual tests for their water. Schlitterbahn Waterpark Resort (New Braunfels, Texas), uses a Taylor Technologies Complete Kit (Sparks, Md.) to test its pools' pH, free chlorine, total alkalinity, hardness and acid and base demand several times a day, depending on pool size.

Noah's Ark checks its chemical levels four times a day, twice the state's mandate. And The Beach mechanically checks levels every hour and manually ever other hour. Soak City Waterpark, which is within Cedar Point Amusement Park and Resort (Sandusky, Ohio), uses a staff of aquatic technicians to check the automated systems and water for each of its pools every two hours.

"Safety is in everything we do," says Bill Spehn, who manages operations at Soak City. "We will do over 100 water tests a day at Cedar Point, so no pool water goes two hours without being checked by an aquatic technician."

During that time, water has circulated through the filter systems at least once. All of Splashtown's pools pump through the filters once an hour, and Cedar Point's 24,000-square-foot wave pool with 427,000 gallons of water also turns over in an hour.

"When we built it, that was something we required," Spehn says. "We felt that was the best way to keep the water, no matter what size, clear so the lifeguards could see the bottom."

"You must have proper water balance with your sanitation, and keep your residual proper, but having one-hour turnover works with that," he says. "You get that many bodies in a pool, and they haven't showered or bathed, and you have all that suntan lotion, the more you take it through sand filters, the better off you are."

Noah's Ark can turn its 1.8 million gallon wave pool over in two hours; the state requires it be done every six hours.

The park typically looks at the state requirements and at least doubles them. For example, Wisconsin requires waterparks to employ at least one CPO. Noah's Ark has eight on staff and at least four working a day.

"Just to make sure it's safe," Gantz says. "Safety is always number one. With new rides, we make sure they're tried and true before there is a public opening."

"We have the same concerns with water quality. We don't want to meet state standards, we want to beat them," he adds.

Waterparks often strive to exceed state standards. Ohio standards require pools to keep their chlorination levels at 1 ppm (parts per million); Cedar Point keeps its pools at 1.5 ppm, and The Beach maintains a 2 ppm level at the kiddie pool and 1.5 ppm standard at all other pools.

White Water Atlanta's standard was 1.5 ppm, but after the E. coli incident it is setting its chlorination levels at 2.5 ppm, says a company statement.

U.S. Filter's Martin says the actual ppm reading isn't enough of an indication of sanitation capabilities.

"It's been shown time and time again that to maintain sanitized conditions in the dynamic conditions of a pool, the only way to assure an effective rate of oxidation is controlling based on ORP."

While water with proper ppm readings at the time of testing may have high ORP levels in a pool without swimmers, once the lotioned crowds come, with some swimmers practicing poor hygiene beforehand and others considering the pool a communal toilet, the oxidizing power drops.

Although such automation improves effective sanitation, and manual tests back up the unit's diligence, and water recirculation adds even more protection, nothing is foolproof.

"If you want to undermine a system, it can be done," U.S. Filter's Martin says. "Education is a big factor in the big picture."

That includes education of staff and customers. Many waterparks are banning diapers in their pools and not only require plastic, sealed pants on diaper-wearing children, but sell them in their gift shops. The Beach posts signs stating, "Diapers are not permitted to be worn in any pool; babies and toddlers are required to wear elasticized plastic coated 'pool pants' when entering any pool; changing of diapers is not permitted in pool areas."

The waterpark directs patrons to the gift shops for pool pants and to changing stations in restrooms.

White Water instituted a require-

ment for plastic, sealed pants after the June E. coli incident and will provide them free of charge, says a company statement.

It also banned groups of young children, requiring that children in the kiddie pools be accompanied by parents or guardians.

In implementing the no group policy, White Water officials were reacting to the likely culprit of contamination, and also assuming that parents are less likely to bring sick children to the park, says a company statement.

Parents also may be able to maintain closer supervision of individual children than can a day care provider overseeing a dozen or more kids.

White Water is unusual among waterparks in that its location, in a metropolitan suburb rather than a tourist destination, brings the park a lot of local group business.

"Our guards have the authority to tell patrons that if their children are wearing sagging or disposable diapers that they are not allowed to swim," says Margaret Drexel, director of marketing for The Beach.

While parks take different approaches when responding to fecal incidents or other contaminations, all immediately evacuate the pool.

Cedar Point removes the defecation and increases sanitation by 1 ppm. Once that level is reached, guests are allowed back in the pool.

The Beach shocks its contaminated pools to 30 ppm and lets it sit for 12 hours to 24 hours before allowing guests back in.

Walt Disney World, which contains River Country, Typhoon Lagoon and Blizzard Beach waterparks, is required by state law to drain the kiddie pools after contamination and completely replace the water.

For adult pools, guests are allowed back in the pool when the water has been disinfected.

And fecal incidents happen. At Cedar Point, where Soak City is an average-size waterpark, incidents happen "several times a season," Spehn says.

Still, they have never resulted in the bacterial outbreak that apparently occurred at White Water.

As its industry reacted with surprise to a waterpark's link to E. coli, White Water is pressing for more industry research and greater controls by all waterparks, says a company statement.

According to Spehn, this event is a wake-up call, even though waterpark pools, because of their size and filtration/chlorination systems, "take a lot not to be safe."

"It's an alarm for anybody who doesn't take water quality seriously," he says. "The wake-up call should be that water quality isn't to be put on the back burner. It has to be on the front page." ■



## White Water: What happened?

INVESTIGATIONS INTO WHAT exactly happened at White Water in Marietta, Ga. are continuing. Its Captain Kid's Cove is a kiddie pool with less than 2 feet of water around a colorful complex of slides, bridges, climbing platforms, waterwheels, fountains and waterfalls.

State health officials believe a sick child, visiting the park with a home care day care group, defecated in the pool on June 11. This contaminated the water, which was swallowed by other children before chlorination and the pool's filtering system could kill the bacteria.

As a special note, White Water's rides and attractions use separate circulation systems, so any water contamination at Captain Kid's Cove wouldn't have reached the neighboring two children's play areas, the lazy river or the wave pool, says a company statement.

Authorities have so far exonerated the park, saying its chlorination system was working properly and the fecal accident, by its very nature, may have been invisible to lifeguards working an unusually crowded pool. Whether the bacteria was actually transmitted through the water, via an object at the play center or by children touching hands remains in doubt.

White Water officials admit that chlorination levels "were much more volatile than usual" before the incident due to unseasonably high heat and crowds, says a company statement.

— *Eric Minton*

SWIMMING  
**POOL/SPA**  
A G E.

July 20, 1998

Eric Minton  
1713 Green Street  
Warner Robins, GA 31093

Dear Eric,

With the August water safety/pathogen issue almost behind us, we have started to reflect upon the process of putting together the comprehensive special report.

When we first began discussions about re-focusing the issue to include extensive coverage of the E. Coli outbreak and its ramifications, we were nervous to say the least — nervous about the magnitude of what we were proposing and of the short amount of time we had to complete it.

Looking back, we realize that you are the main reason we were able to tackle the nearly impossible feat of a last-minute August issue overhaul. You knew that reporting on the subject of waterborne pathogens, ill children and the industry's role in water safety issues would not be easy — particularly since we gave you only 10 days to do it. Yet you were willing to accept the assignment without question, proving your dedication to the magazine and fueling our own excitement and determination to produce an outstanding and informative piece.

Your professionalism, hard work, reliability, thoroughness and, dare we say, "journalistic hustle" is evident in the final product. Frankly, we couldn't have done it without you. It gives us high hopes regarding where this magazine can go editorially with your help. We are proud that you are part of the SWIMMING POOL/SPA AGE editorial team. We know we can count on you — and for that we thank you.

Sincerely,



Heather Siegel  
Managing Editor



Michael Pallerino  
Editor