

# Scientists discover, patent, sell waste-water tech

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Sam Houston State University has applied for six federal patents, three of which have already been awarded, to protect the technology and engineering associated with a "revolutionary" packaged wastewater treatment system invented by its scientists, and it has formed a company to further develop, market and sell the systems.

The system is designed around a proprietary consortium of [microorganisms](#) - [bacteria](#) -- that are naturally occurring in nature which provide the capability to clean the wastewater with a very high efficiency while leaving no toxic by-products.

The physical systems themselves - that house the bacterial "cocktail" in "bio-reactors" - use little energy, are completely portable, scalable, simple to set-up, comes on-line in record time, simple to operate and can be monitored remotely, according to the lead scientist on the project.

"The science and engineering technology behind this process have both military and civilian applications," said SHSU lead investigator Sabin Holland.

"The technology was developed for remote applications where little infrastructure exists, examples being remote military operations, disaster relief efforts, and nation building."

Holland has managed the research and directs the program at SHSU's Texas Research Institute for Environmental Studies.

"We have gone from basic research into the bacteria to actual construction and deployment of the systems in seven years. The typical time from laboratory discovery to commercialization is 14 years," Holland said.

"The bacteria, the 'bugs,' we are working with are naturally occurring and can be found in a common handful of dirt, which would typically contain hundreds of kinds of bacteria. We have isolated a small subset of them, each having a specific function, to engineer a [biofilm](#) that is self-regulating and highly efficient at cleaning wastewater."

Sabin has demonstrated the systems' robustness and effectiveness at several municipal and military deployment sites by cleaning influent wastewater within 24 hours after set-up to discharge levels that exceed the standards established by the Environmental Protection Agency for municipal wastewater, and leaving less than ten percent of sludge, in most cases less than one percent.

"The typical septic system or traditional waste treatment process can take as long as 30 days and leave as much as 40 to 50 percent sludge," he said.

Part of the recent engineering and component testing of the research and design were done in partnership with Lamar University and Sul Ross University, Sam Houston State's sister institutions within the Texas State University System.

"The technology is scalable," Sabin said. "We can make the units as large as required for large scale treatment applications, or as small as a single home unit."

The research has been funded over the last three years by U.S. Department of Defense. The first deployable systems have been

purchased by the United States Army for use in Afghanistan. The Army's systems will be deployed in rugged terrain and transported by the Army's standard heavy trucks using a standard palletized loading system.

After an extended search for a business partner, Sam Houston State selected a private firm, PCD Inc, of Palestine Texas, to form a limited liability corporation company named Active Water Sciences (AWS), to manufacture, market, sell and further develop the systems. The University retains a majority interest in the corporation and has licensed the technology to AWS for three years.

"This technology is an elegant, simple system," said Dan Davis, SHSU's associate vice president for research administration and technology commercialization. "It's revolutionary compared to standard technology. We are at a very exciting point in its commercialization."

Source: Sam Houston State University

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