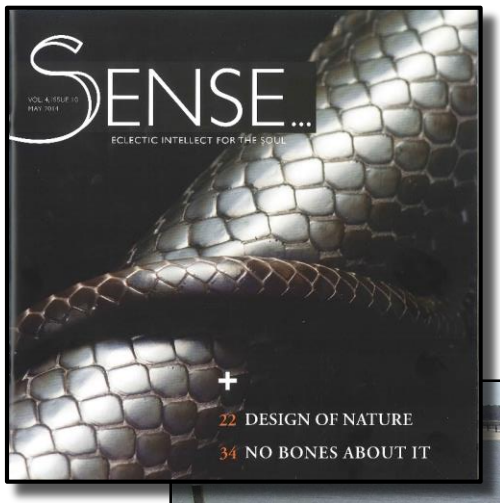
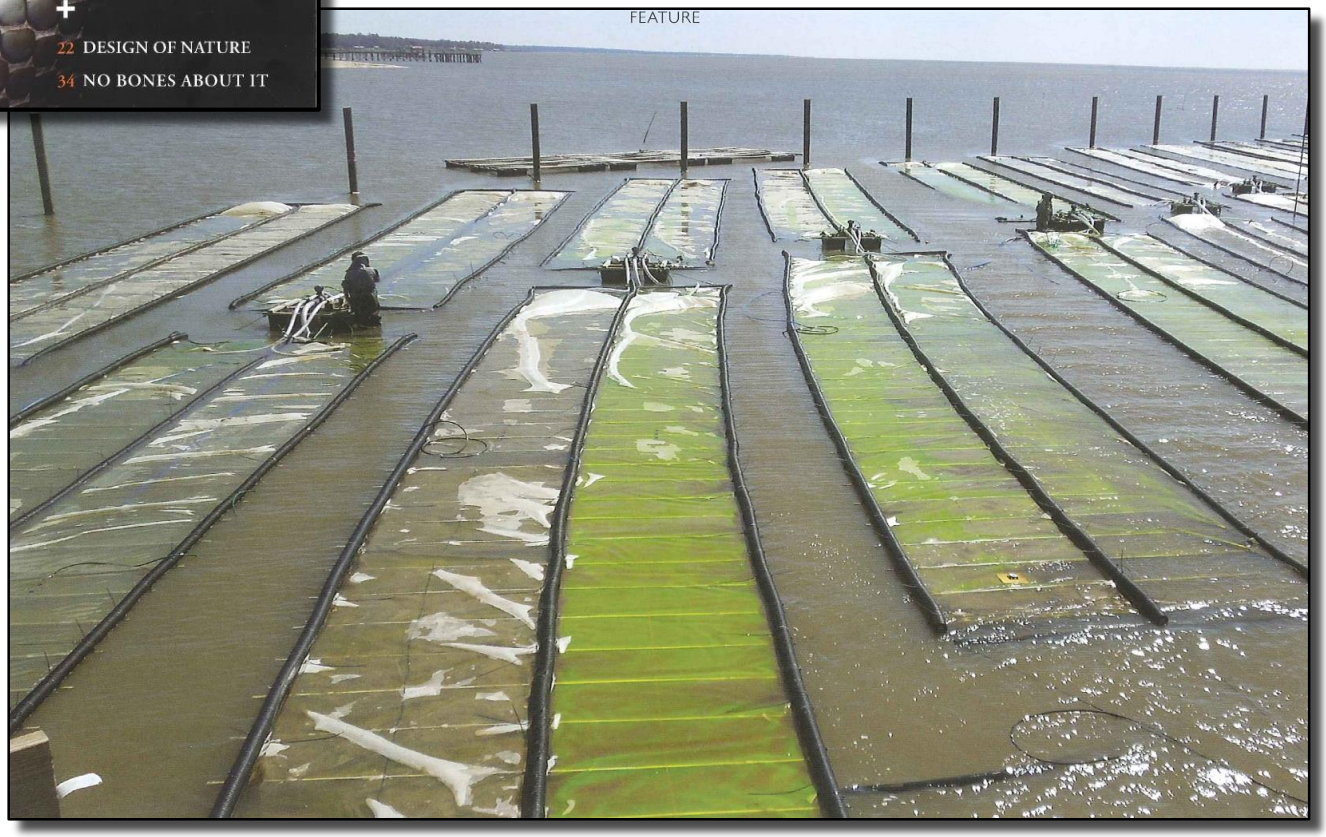


GROWING GREEN

How Daphne Sewage Spills Lead to An Algae Treatment Process with Backing from Japan

TEXT BY EMILY HILL



In 2005 Daphne Utilities was struggling to handle the overwhelming sewage overflow issues the city faced. They never dreamed that the solution to this issue would put the city on the map, and lead to working on an algae project with major backing from a Japanese engineering firm.

General Manager of Daphne Utilities Rob McElroy said the sewage overflow was a result of the public not recycling things such as cooking oil, and other pipe-clogging materials. "If every home was only responsible for a single teaspoon of fats, oils or grease getting into the sewer system a day, it would be the same as if once a month somebody opened up a manhole and poured seven 55 gallon drums of oil into the sewers," McElroy said.

So to combat the problem, Daphne Utilities initiated a cooking oil recycling program in 2005, where jugs were made available for city residents to properly dispose of the oil. The city started receiving so much oil, they wanted to make good use of it. Daphne Utilities began work with Kevin Jones of Earth Clean Technologies and built a biodiesel plant to convert the oil to biodiesel, and could do this for about 96 cents a gallon. "Every gallon of this stuff we're making, we're saving our customers about three or four dollars a gallon over diesel we had to buy," McElroy said.

The city saw a reduction of sewer spills of more than 70 percent, but McElroy also said this project put the area "on the radar screen nationally" because nobody else was doing this.

So how did a sewage overflow solution and biodiesel plant development lead to the city's work with algae? It all stemmed from a tweet.

According to McElroy, Jones came across a tweet on Twitter from a man at Algae Systems saying they were developing a process to convert algae into fuel. "He thought that was kind of cool so he reached out and contacted them, and they said they developed this stuff in a lab but were looking for a place to scale it up and do a pilot plan. Kevin told them to come to Daphne, Alabama," McElroy explained.

About two years ago Daphne Utilities met with Algae Systems, the two partnered up, and began the pilot test. "All of this came about by trying to stop sewer spills in Daphne. The next thing you know, we're on the leading edge of technology trying to convert algae into both clean water and alternative fuels," McElroy said.

According to McElroy, the process occurring in Mobile Bay, which can be seen from Bayfront Park pier in Daphne, generally involves manufacturing large "rafts" from clear plastic, filling the baffles with natural freshwater algae from the local area, feeding that algae nutrients from disinfected wastewater and floating the bags in the bay for about 4 days until the algae have their fill, reproduced all they can and are ready for harvest.

"At the end of that time, the algae, having been stirred naturally using the wave action of the Bay, will have eaten all the nutrients in the wastewater," McElroy said. The solution is then pumped back to the shore, separated into a concentrated algae solution and clean water of at least adequate quality for irrigation purposes and can be further filtered or refined into drinking water. The algae solution, according to McElroy, is further processed into "bio-crude oil" which can be further refined into any desired fuel such as jet fuel.

Although McElroy can't release the name of the Japanese company investing in this project, he said Tokyo investors visited the Daphne area in late April through early May to get a "face-to-face update" to see exactly what the status is on the project. McElroy says Japan originally got word of the project because one of the suburbs of Tokyo is a sister city to Mobile.

Since the pilot test is being done by Algae Systems with backing from the Japanese engineering company, it's not costing Daphne Utilities or the city of Daphne any money. However, McElroy says investors have put a little more than 4 million dollars into this one plant.

McElroy says there are two scenarios that this type of technology could be used for. One scenario involves taking the project to poverty-stricken countries. "If you wanted to build a plant capable of treating probably a million gallons of sewer waste water a day, it might take you two or three years to build that plant. This type of facility has a much smaller footprint. It doesn't take up any land area, so it's something that literally could be flown in, dropped in, set up much quicker than coming in and building hard infrastructure on the ground, and a lot cheaper," McElroy said.

"The other scenario would be as an emergency treatment technology that could ramp up very quickly with very little hard infrastructure construction. Such as New Orleans after Katrina, when the entire waste water treatment system is dead and it's going to take months if not years before they are going to get it up and running back on the line," McElroy said. The algae water treatment set-up would have a fast response time and would fill the gap while a permanent infrastructure is being built.

The Japanese engineering firm is looking for a site to scale the project up to the next step, which McElroy says would be a full commercial scale where they would be producing both water and fuels that would be intended for sale. The Tokyo investors are pursuing two alternative means of processing algae into fuels. "I don't think there's direct competition between the two, I think there's just two variable ways to do it that they're looking into," McElroy said.

McElroy says he personally doesn't believe there's enough area where the process is currently taking place to create a large scale. However, he says the Japanese company is looking at other sites in the area, even other sites in Mobile Bay, to build the large scale project. The Japanese engineering company is expected to issue a press release regarding the project before the end of May.

Algae Systems President John Perry Barlow (left) and Rob McElroy with algae system they hope to use to turn "sewage energy" into fuel.