Understanding Barnstable's waste water facility

by Andrea Leonard and Janice Zeppenfeld

Photos by Mark Cote

Ordinarily, one wouldn't choose to spend such a day at Barnstable's waste water treatment plant at the corner of Route 28 and Bearse's Way, Hyannis. Bright sunshine, low humidity, and fresh breezes from the southwest suggest recreational pursuits. But then, we don't make the weather. We just take what comes.

Responding to an invitation issued weeks earlier, Village Advertiser publisher Carlton Crocker, staff photographer Mark Cote, editorial contributor Jan Zeppenfeld, and I were welcomed by Chief Plant Operator, Peter T. Doyle.

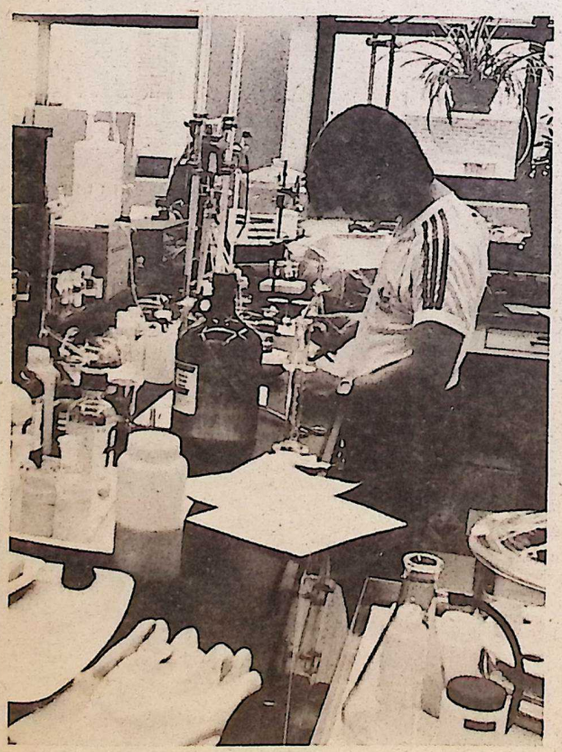
Tall, slender, a man of easy friendliness, Doyle wore a neatly trimmed black beard. Intelligent interest in his work and our questions about the plant's operation reflected in his dark eyes as he began our tour with an audio-visual presentation illustrating Barnstable's waste water treatment. Following the slide show, Doyle took us on a sightseeing walk of the facility.

Our first stop was the laboratory where water is tested for grease, phosphates, nitrates, metals, and other pollutants. Water samples are brought to the lab from nine test wells located south of the plant in a sweeping semi-circle, starting at the Airport Rotary and extending south and west between Route 28 and West Main Street. By monitoring the water quality in the test wells, a constant check is made on the efficiency of the treatment plant. Barnstable's town engineering department also uses the lab's facilities at times.

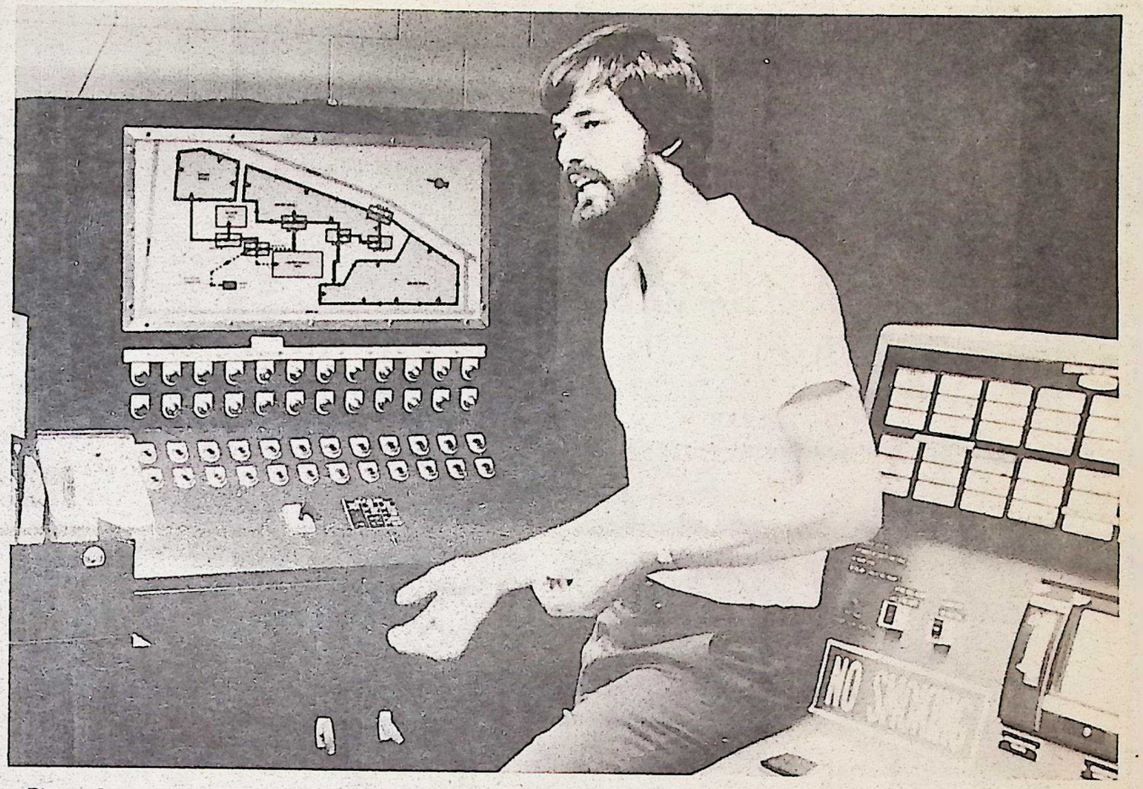
Next, we viewed the "reception center" where septage is brought in by tank trucks which have pumped cesspools and septic tanks at residential and commercial locations. A steady stream of "honey wagons" arrived, hooked up to the receptor pipes, paused while their contents were drained, and then roared away to collect another load.

"This plant was not designed to handle unlimited quantities of septage," Doyle remarked as we proceeded to the pretreatment building where the first step in removing impurities is conducted. "Septage is our biggest problem."

"Potent" is the word Doyle uses to describe septage. "It's at least 20 times more potent than material received from the sewer mains. To process all the septage we get now, we need much more waste water from sewers." The plant is currently way below capacity for sewage processing. "To dilute the septage," Doyle continued, "a couple of million more gallons of (waste) water, every day, would be required.



College student Henry Skinner is pictured working in the lab. He assists John Quinn in sample testing which constantly monitors the waste water treatment.



Pictured in the control room, Chief Plant Operator Peter Doyle answers questions about the Town of Barnstable's Waste Water Facility. "...No one could foresee the enormous growth of unsewered neighborhoods in the town."

"As recently as 1975, only a million gallons of septage a year was coming in. No one could foresee the enormous growth of unsewered neighborhoods in the town. Now, at the present rate of delivery, we will have to accept over six million gallons of septage in 1983. Built to process 20,000 gallons of septage a day, the plant is now taking in 30,000."

Eleven men, he told us, operate the entire facility as well as maintain the outlying sewer system. The plant was built to process 4.2 million gallons of waste (septage and sewage) a year. Presently, it processes one million gallons in the winter months and two million gallons in the summer. The difficulties in processing a rise from the uneven ratio of sewage to septage.

While leading us to the primary tanks, Doyle outlined the plant's operation. Waste that has been brought in by the trucks and pumping stations in the town are sent through the pretreatment plant. Here solids are removed by various methods to protect downstream equipment from clogging and wear. The flow is also measured at this point. At this stage, septage receives additional chemical treatment (because of its concentration) before it is added to the flow.

The next step is the primary clarifying tanks, where the flow is slowed down to allow heavy solids to settle to the tank's bottom. The resulting settlement is called primary sludge, which is removed through a sump hole at the bottom of the tank for further processing.

The flow then travels to aeration tanks, where the sewage is treated with bacteria. These bacteria, found naturally in the environment, are mixed with and feed upon the sewage in a carefully monitored process.

The mixture of bacteria and sewage then proceeds to secondary clarifying tanks. In these tanks, the bacteria, which have absorbed 90% of the pollutants, settle to the bottom and are pumped out. Some are then recycled back to the aeration tanks. In this tank also, the product is checked visually for clarity, as an indication of the efficiency of the process. The liquid is then pumped to the filter beds that stretch over acres of ground west of Bearse's Way and north of Route 28. One to two feet of special coarse-grained sand tops many feet of regular sand in the filter beds. Liquid from the secondary clarifying tanks is ultimately filtered through the sand layers. It percolates down and re-enters the groundwater supply.

Crossing a grassy hillside, we approach two more, smaller, tanks. In the first, a tall structure encircling a deep pit banked with earth, is grease. (Note: all of the tanks mentioned are built of poured concrete with tar lining.) The contents of this tank stink. The stench is familiar to people east of Bearse's Way. In winter when prevailing winds are northeast, the odor elicits few complaints; but summer's prevailing southwest breezes carry horrid smells to nearby commercial areas. Doyle says that grease emits the foulest and most awful smells imaginable. Our noses confirm his opinion.

Originally, the grease was processed along with the rest of the waste, which meant it was included in the tanks closest to Bearse's Way. Now it is processed in a separate tank that is as far away as possible from the roadway. In addition, every attempt is made to keep the level of the grease as low as possible to mitigate the odor. A portion of $100,000 appropriated by the town is being used to design covers for the grease tanks to further alleviate the odor problem.

Commenting on the odor and its origination, Doyle said, "The sewer plant was here long before all those businesses and the mall moved to sites immediately adjacent to the plant. Admittedly, it was a much smaller facility then, but logically, as the town grows, so must its sewer plant."

We did not linger long at the grease tank but moved along to the second which held semi-solid sludge. Contents of both tanks are conveyed mechanically to the last building on our tour. Here, primary sludge and excess bacteria go through a spin-dry process to remove remaining liquid and, through a centrifuge, form cakes of material that are finally trucked to the landfill for burial.

"Septage is our number one problem," Peter Doyle reiterates. "Related to that is our second biggest problem: grease. It doesn't break down biologically. If no grease ever entered cesspools and septic tanks, they would work much more

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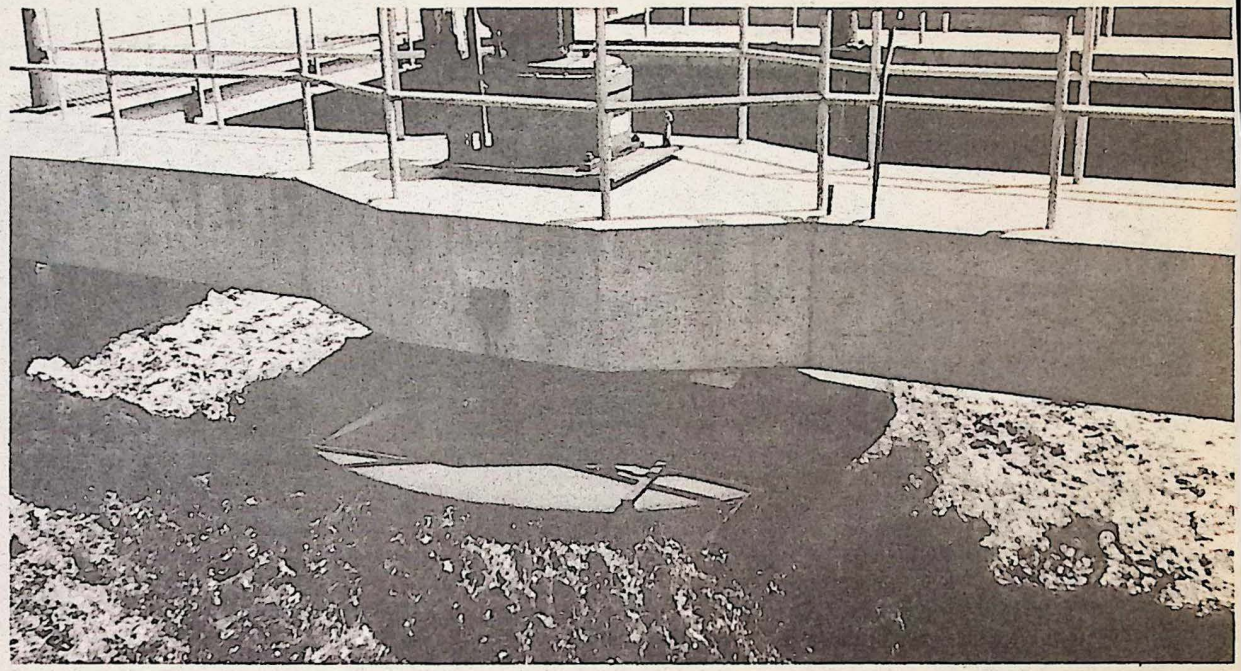
efficiently.

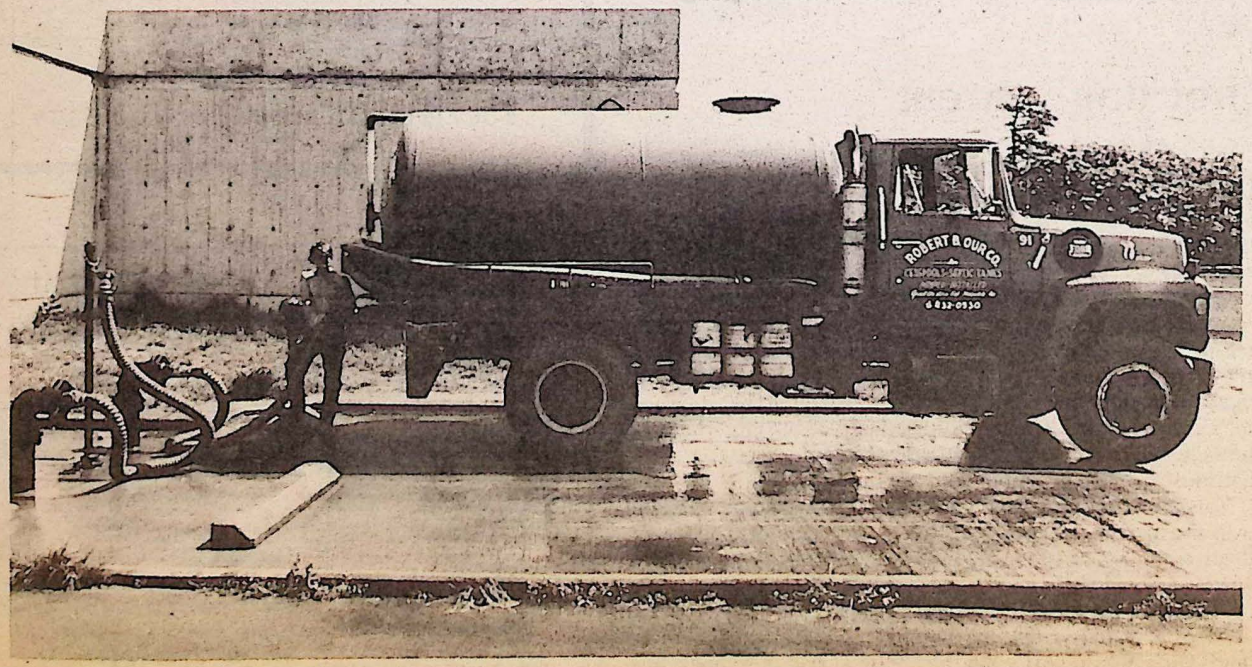
"This plant was not designed to handle the quantities of septage being delivered here. It was designed as a limited facility based on the population projections of the town at the time. Also, it was expected that the sewer system would expand, but it hasn't. But if no grease and oil went down the drains, handling septage would be a much simpler part of this operation."

The plant is currently handling septage at maximum capacity, with this summer's tourist season only beginning. Septage must continue to be brought to the plant because there is nothing else to do with it. "It's almost too late now," Peter Doyle believes, "however, we are now in the process of experimentation with innovative and alternative technology, (using part of the funds appropriated recently) so we CAN process ALL the septage the town will produce."

So, grease is it . . . and septage. Touring the waste water treatment plant may not be the pleasantest way to spend part of a beautiful summer's day on Cape Cod, but our visit was an educational experience...one worth sharing with you.



Aeration tank in action. Here, bacteria are introduced into the water to "feed" on the sewage.



Septage is the number one problem at the sewer plant. Designed to handle 20,000 gallons daily, the plant is currently taking in 30,000 gallons delivered by septage haulers as pictured .