



UNIVERSITY OF NORTH CAROLINA SEA GRANT PROGRAM NEWSLETTER

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Septic tanks: The consequences of growth

Wallace Beckham gets downright upset when he starts talking about the water system he wants for his community. One of the reasons Beckham gets so exercised, he says, is that in places crowding development in Avon is outpacing the ground's ability to process wastewater from septic tanks before returning it to the water table and people's wells. Some wells, Beckham says, have been tested and found contaminated in his Outer Banks community.

"The more septic tanks get in, the more pollution we're going to get. . . They're waiting for us to have an epidemic out here," Beckham says. And he isn't the only person in coastal North Carolina who's worried about septic tanks.

Mrs. Rosetta Short, head of the Long Beach planning commission, says the rapid development of her town has created a "serious problem and possible pollution of drinking water and the estuary." Townspeople, she says, "don't realize it. They see all these lots that are undeveloped . . . but we've got to see five to ten years" into the future.

To begin to deal with the potential crowding of septic tanks and their drainage fields, Mrs. Short is recommending increasing the square footage required on each lot, because, she says, "the carrying capacity of the land cannot tolerate 7,500 square feet." (Square footage requirements vary from county to county.)

Some of the larger communities in coastal North Carolina have waste treatment plants, but smaller communities, isolated homes and most of the houses along the coast use septic tanks for disposal and wells for water. Septic tank overflow and inadequately treated sewage have been blamed for much of the pollution contaminating over 600,000

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The rules

So what's being done about regulating all those septic tanks?

David Stick, vice chairman of the Coastal Resources Commission, says "There's no governmental entity which seems to have the jurisdiction for an overview . . . authority and responsibility are fragmented." And worse, "nobody can really tell us what the situation is."

But a couple of problems are evident:

—many observers, Stick among them, are quick to suggest that local sanitarians do an uneven job of handing out septic tank permits;

—in addition, observers often fault the North Carolina Commission for Health Services for failing to adopt for homes the newer, more stringent regulations which are already being used for larger construction.

The "Rules and Regulations Governing the Disposal of Sewage from Any Residence, Place of Business, or Place of Public Assembly in North Carolina," were worked out jointly by the staffs of the Commission for Health Services and the Environmental Management Commission. Health Services will consider adoption of the joint resolution once again at a May 8 meeting in Pinehurst. (The public is invited. For details, write the commission at P.O. Box 2091, Raleigh, N.C. 27602.)

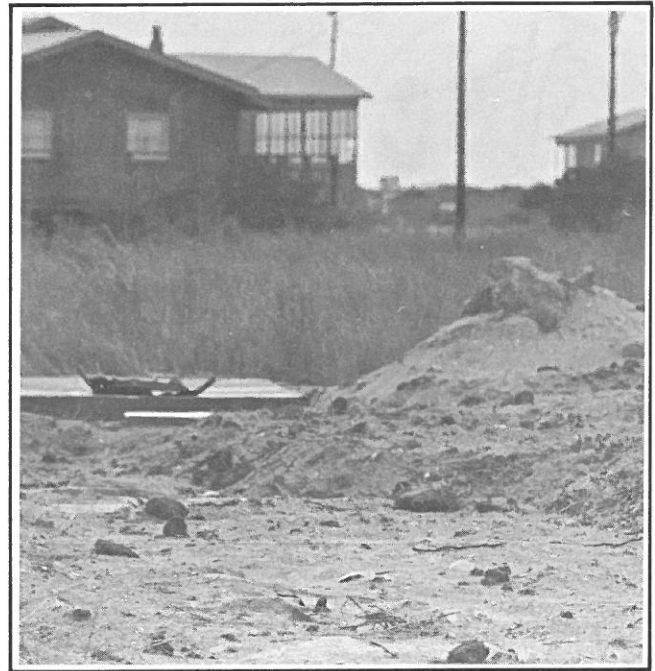
Septic tank oversight is spread between two state agencies and the local health departments. The health departments, under the Commission for Health Services, are responsible for overseeing most residential development. That is, those offices have jurisdiction over all construction that would generate no more than 3,000 gallons of sewage a day.

Over 3,000 gallons a day or in a case of discharge into surface waters, the Environmental Management Commission oversees waste disposal and treatment. The commission manages such development as motels, condominiums, trailer parks, and commercial structures.

The Environmental Management Commission issued only about 40 permits last year for the larger projects under the joint resolution's stringent guidelines. But county health departments across the state allowed over 40,000 of the residential septic tanks to be installed.

Each county adopts its own guidelines. Until and if the Commission for Health Services adopts the tougher guidelines, the one common denominator in county enforcement is the state's minimum standard set forth in the Ground Absorption and Sewage Disposal Act of 1973.

The Act requires two permits be issued by local sanitarians. One is required before construction



An open septic tank drainage field

begins and the other upon completion of construction. Septic tank drainage fields—large beds of gravel—are left open for the sanitarian to inspect. Such factors as character and porosity of the soil, percolation rate, topography, depth of the water table, and location of water-supply wells are considered.

The hitch is that enforcement of the Act is left up to local sanitarians and boards of health, which, according to Stick, "vary tremendously."

Some sanitarians, he says, enforce the law to the letter, but others might "let 'em get by with everything." And Mike Bell, coastal regional engineer for the Commission for Health Services, admits "we do have this problem in some areas." But, he adds, the real problem is often in the politicking of local health departments, county commissioners and such.

"Politics plays a very big role in this . . . I feel it was politics that helped withstand the implementation of the joint resolution regulations." When tough cases arise, Bell says the sanitarians don't always get the backing they need from higher ups.

Had the Commission for Health Services adopted tougher regulations, Bell says, there would have been a lot more turn downs on septic tank permits than are already occurring.

In Dare County, A. C. Turnage, regional engineer for the Environmental Management Commission says "the potential for pollution of that water supply is dangerous." But county sanitarian Joe Stokes insists that his county has one of the strongest septic tank regulations in the state. "The criticism we're getting is not justified," he says.

Finally, stricter dredge and fill regulations should help avoid creating bad septic tank situations for the future.

The future: more questions than answers

Since beach houses and summer fun and normal population growth are a fact of life, the septic tank problems in coastal North Carolina won't vanish overnight. Sanitarians will continue to face the insistent demands for just one more house. Businessmen will continue to demand a clear path to the tourist's dollar. And tourists will continue to demand their place in the sun.

Septic tanks and sewage disposal plants are already taxed to capacity in some places. David Stick, vice chairman of the Coastal Resources Commission, says existing regulations are outdated.

Questions arise about the carrying capacity of different regions, how far septic tanks must be from bodies of water, whether the cumulative effect of ostensibly correct septic tanks will turn out to be detrimental, what the viable alternatives are, what can be done about existing problems not covered under construction-oriented regulations. And the state is only beginning to learn what the relevant questions about long-term consequences are.

What's being done?

Clearly, damage has already been done. The question is: How much, and what must be done to stop further damage?

To help answer that question:

—The Coastal Resources Commission (CRC) is taking a look at the situation. The CRC's aim, according to Kenneth D. Stewart, executive director, is "to stimulate the agencies that presently have authority in this area to act." The CRC hopes to impress upon local governments their existing authority to regulate septic tanks, upon state agencies the need to enforce existing regulations, upon the Commission for Health Services the need to adopt stricter guidelines, and upon county governments the need to consider sewage disposal in their development plans for the Coastal Area Management Act.

Observers say in a pinch the CRC could possibly exercise some more direct control in the Areas of Environmental Concern (AECs). But that control would be fragmentary, they say, at best. It could be extensive in some counties, but not in others, they say.

—Federal and state government are offering some limited money to municipalities for planning and construction in direct point-source waste treatment. Several coastal communities and counties, among them Surf City, Carteret County and the Dare County Outer Banks, have received a share of this "201 money." But Barry Williams, head of the Department of Natural and Economic Resources task force on 201 planning, says the money

will likely soon run out. It is, he says, "not going to take care of the septic tank problem by any means."

Besides, he says, despite the number of coastal communities involved, the 201 planning money is "still really taking care of a small geographic area of the coast." No construction money has been awarded in the coastal area.

Further, none of the limited federal area-wide water quality planning money has gone to the coast, either.

Where to turn?

Some people say the only way to turn is to the ocean to dump treated sewage offshore from regional systems. That possibility is being studied under several grants in the state. The Coastal Plains Regional Commission and the Environmental Protection Agency recently appropriated money for a study of the environmental and economic effects of disposing of municipal sewage through ocean outfall. And L. J. Pietrafesa, NCSU, is studying ocean circulation characteristics for outfall possibilities under UNC Sea Grant funding.

Objections to ocean outfall have been raised. And some scientists say there should be other alternatives. Dr. B. L. Carlile, assistant professor of soil science at NCSU, says on-land irrigation of sewage over the vast wastelands along the coast would be a better alternative for larger systems.

For smaller systems, for all those scattered backyards, Carlile is studying several methods with the hope of developing something that will only be half-again as expensive as conventional septic tanks (under \$1,000).

Carlile sees most promise for the coastal areas in a low pressure pipe system, and a mound system that provides an artificial nitrification field well above the water table. Carlile's methods are being tried out in a development in Perquimans County on Holiday Island.

The long-range questions, though, are far from being answered. Some say there are simply no good alternatives to septic tanks and that the answer must lie in some sort of large-scale regional systems. The questions, at least, are beginning to be asked. But, the answers still lie in the future.

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'A difficult situation'

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acres of the state's shellfishing waters.

Here and there on the coast, crisis points have already begun to spring up. In the Surf City area, according to Mike Bell, regional engineer for the state Commission for Health Services, the uncontrolled installation of septic tanks and the location of septic tanks too near the water's edge have allowed wastewater to seep into the sound without natural treatment.

David Stick, vice chairman of the Coastal Resources Commission, adds to the problem areas "almost any place on the Outer Banks . . . Bogue Banks."

It sounds like one of those boring issues that planners and government officials fight over. But as Wallace Beckham, the state's shellfishermen, and the residents of towns like Surf City and Long Beach are discovering, septic tanks can be crucially important. They can affect the quality of the water we drink and the food we take from the sea, not to mention our health.

A septic tank is a relatively simple apparatus that, once hooked up and buried in somebody's backyard, is supposed to filter out gross wastes and then release liquids to percolate through the soil and eventually back into the ground water. The idea is that during percolation, bacteria will absorb the contaminants.

To work properly, a septic tank's drainage field must not be too porous or too dense, and it must not be too near drinking water supplies. If the soil is too porous, the liquid rushes through before the pollutants can be absorbed. If the soil is too dense—impervious—then the wastewater may either sit near the surface and not be further absorbed, or move laterally to pollute surface waters and other backyards. If the wastewaters are discharged too near a shallow water table, then the drinking water can be contaminated.

The soil and water table at the coast make septic tanks a tricky business. The soil is frequently completely sand. The wastewater can just rush through. Or, the soil is pervious fill material dump-

ed on top of often impervious soil which will not absorb the wastewater properly. Or, the water table is very near the ground's surface and wastewaters don't have far enough to percolate before entering the ground water. In Avon, for example, Beckham says wells need only be sunk seven feet. And septic tank systems are required to be at least two feet above the water table, he adds.

With high land prices, lots on the coast are often small and land is at a premium. According to A. C. Turnage, coastal district engineer for the Environmental Management Commission, "there's a lot of development taking place on the coast that involves filling in on marsh . . . these sites are not suitable for septic tanks."

Problems with the soil and water table are aggravated by the increasingly dense development on the coast. In fact, the Coastal Resources Commission, which is overseeing implementation of the Coastal Area Management Act, has heard testimony that almost 90 percent of the soil in the coastal region is unsuitable for conventional septic tanks.

"The problem is critical now"

But, of course, much of that land has already been developed. Turnage says "in many of these beach areas, the problem is critical now." Though Dare County hasn't reached the critical levels Carteret County beaches and the Surf City area have, Turnage says, "they (in Dare County) are putting a tremendous amount of septic tank effluent into the ground in a rather restricted area." The drinking water in Dare comes from a thin layer of ground water, Turnage says, and the potential for contamination of the water "is quite considerable."

Turnage says regulatory agencies have already reached the point of having to turn down requests for septic tank or other treatment permits due to the near saturation in some areas. Until municipalities can begin to put in sewage systems, he adds, "I see a real difficult situation to contend with for the next three or four years" along the coast.

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