CHAPTER 10

SEWAGE PROBLEMS

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"How bad is Honolulu's sewage problem?"

Honolulu Mayor Frank Fasi has said it would cost $1.1 billion to upgrade Oahu's wastewater treatment plants from "primary" to "secondary" treatment, resulting in higher sewage fees by a factor of two and a half. Adding insult to injury, he asserted all this money would produce little benefit.

Lawyers from the Sierra Club Legal Defense Fund (SCLDF) have suggested the cost of secondary treatment probably would be less than a third of the Mayor's estimates, and that Honolulu should conform to the federal requirement for secondary treatment, just like everyone else, regardless of the cost. At the same time, some Kailua residents clamor for "tertiary" treatment of effluent from the plant serving them.

Before we try to make sense out of this, I need to explain "primary," "secondary," and "tertiary" treatment of sewage. **Primary** treatment filters out about 30 percent of suspended solids and removes an equal proportion of oxygen-depleting organic matter. **Secondary** treatment raises these figures to 85 percent, while **tertiary** processing involves nearly complete removal of pollutants as well as disinfection of the effluent. Effluent that has received secondary or tertiary treatment can be used for irrigation or to recharge groundwater aquifers, but all three

processes leave residual solids that must be disposed of in some way.

Now that you know the treatment options, you should understand why the choices must be made by government rather than each of us individually. People usually decide how to spend their own money and in the process indicate what has value to them. Some people go first-class. Others with equal (or even greater) funds choose second or even third-class. Decisions as to what and how much to buy are made separately, in a way that will maximize value to each buyer.

Buying wastewater treatment is more complicated. One person's decision on type and level of treatment matters a great deal to that person's neighbors. Buying less and accepting the consequences might be OK to one buyer whose neighbors may object strongly. Buying less may not only invoke revolting aesthetic images, but also affect the health of those neighbors, the cost of their health care and perhaps other costs such as contamination of their drinking water. Because "third-party effects" dominate this area, a private market for sewage treatment would not reflect in full the benefits of that treatment.

Hard choices. Hence government must enter the picture. Fundamental economic questions remain: what to produce, how much to produce, where to produce, how to produce, who will pay and who gets to use it. But government has little information relevant to answering these questions. There is no market to which the government can look in order to gauge the intensity of demand for more or less sewage treatment.

Other things being equal, virtually everyone prefers more environmental quality to less. Some people are especially strong for environmental purity and would be willing to pay first-class fare to get it. Others, for whatever reason, are not so particular. Unfortunately, the technology and institutions for making decisions on sewage, air quality and other environmental factors do not allow each person his or her own preferred level. We're all in this one together.

Pragmatically speaking, some would assert that the Environmental Protection Agency (EPA) has settled the matter for us. EPA standards, for example, call for secondary treatment of all sewage effluent before it's dumped into receiving waters. But most cities pipe their treated sewage into a river or lake. Honolulu has a very large Pacific Ocean to receive its discharge. Because of this, EPA has the power to waive the secondary requirement for Honolulu as long as effluent can be "deep-

sixed" without adverse effects.

In the context of the primary/secondary treatment controversy in Honolulu, we should note that nine of the City's 12 sewage treatment plants (not counting private facilities) already had met the secondary standard as of 1992. The two largest, however, did not. The Sand Island and Honouliuli plants together account for some 86 percent of the total flow processed by city plants. As primary treatment facilities, these two remove about 30 percent of solids and oxygen-demanding organic materials. What's left is then piped several thousand feet offshore to the ocean depths. Does this dumping adversely affect the ocean?

Ocean disposal. The effects of sewage outfalls on the ocean or coastal environment have been studied extensively. University of Hawaii scientist Richard Grigg was personally involved in many of these studies. He has concluded and publicly stated that "secondary treatment for Oahu's existing outfalls offers no advantages over primary treatment in terms of environmental impact on coral reefs, reef fishes or plankton communities." Pollutants are widely and quickly dispersed by ocean currents which take effluent away from the shore and thus out of harm's way. Viral components die off within minutes, posing no threat. Numerous studies agree that the sewage effluent causes no appreciable negative impact to the ocean environment. In fact, some scientists believe secondary treatment may be environmentally *worse* than primary treatment.

Environmentalists remain unconvinced. Their experts claim city studies have ignored certain marine life forms, like coral or crab zooplankton or larval fish, and have simply assumed ocean currents will keep effluent away from shore. Similarly, Kailua residents, noticing occasional algal blooms in Kailua Bay and pollution in Kaelepulu Stream, ascribe these problems to discharge from the Kailua treatment plant (a secondary treatment facility) and insist that the plant be expanded and upgraded to the tertiary level.

To an extent, these questions of fact can be answered by further research. The University of Hawaii Water Resources Research Center, for example, did extensive studies of Kailua Bay in early 1992 and concluded that pollutants in the bay come not from the sewage treatment plant, but from natural animal and plant life in the marshes and streams feeding into the bay. The ocean outfall, moreover, feeds

into currents moving northerly, away from Kailua Beach.

Closed beaches. Occasional bypasses at treatment plants have sent untreated sewage directly into popular ocean recreation areas and have contributed to the impression that the plants are inadequate. The causes of bypasses, however, generally have been power failures, maintenance activities and faulty sewage mains. None of these problems would be eliminated by an upgrade from secondary to tertiary treatment. Furthermore, old sewer lines have developed extensive leaks, allowing storm water runoff flowing into the sewer system during heavy rainfall to overwhelm the treatment plant. Why not fix these problems first, and *then* decide what, if anything, to do with the plant? The pipes need fixing, and the other problems need solving, in any event.

Other questions are less amenable to scientific inquiry and will probably continue to vex policy makers. For example, the qualifier in phrases like "no appreciable negative impacts" means different things to people with different attitudes about nature. Some might be content to dump *untreated* sewage into the ocean, as long as profits stay high and the effluent lands on somebody else's beach. On the other end of the spectrum, ardent environmentalists might be quite willing to contribute their share of the enormous cost required to attain their high standards—and to insist, through judicial and legislative processes, that the rest of the population do likewise.

Balancing costs and benefits. Uneven distribution of benefits or costs can induce different strategic behaviors. Suppose I, a (hypothetical) resident of Kailua, consider tertiary treatment of sewage to be worth, say, $40 a month. But such treatment would cost each beneficiary $60 a month. To me, it would not be worth the cost.

However, suppose government contributes part of the costs, say the equivalent of $25 a month per beneficiary. My personal share of the costs will then be $35 plus my share of the extra taxes needed to raise the government's $25. Since my share of the taxes (which would be paid by many taxpayers, rather than the relatively few residents of Kailua) will be small, the investment in tertiary treatment suddenly looks good again. I get something worth $40 to me, and my direct cost is only $35.

Beneficiaries in this scenario would be indulging in a game developed by decades of practice in federal water, transportation and other

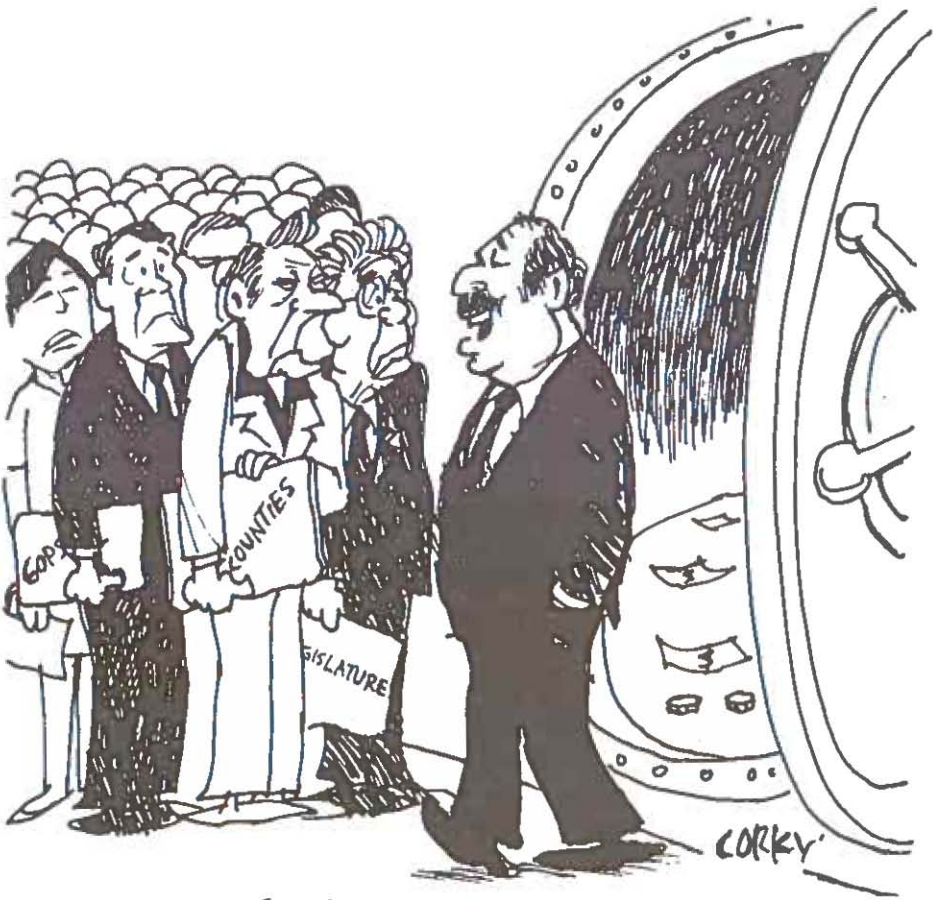
projects and sharpened, until the 1980s, with federal subsidies to sewage treatment plants. Government must ask: are the benefits of tertiary treatment (as opposed to secondary treatment) worth the full costs? Or are the beneficiaries counting on achieving something for which they would not willingly pay, if they had to cover the full cost by themselves? Unfortunately, these kinds of questions do not have clear-cut answers.

Another type of strategic behavior may be significant here. As a means of enforcing EPA regulations, groups and individuals have legal standing to bring suit over perceived violations of the regulations. The SCLDF has been particularly active in this area. Fund lawyers probably share their clients' relatively high evaluation of environmental benefits. Their long-term career paths, moreover, depend to some extent on their success in finding such perceived violations and bringing suit successfully—regardless of the overall benefits and costs of the regulation in a particular setting. Hence the incentive of the SCLDF to sue the city to get secondary treatment at Honouliuli and Sand Island, even in the face of evidence that primary-treated waste has no appreciable negative effect on the ocean environment.

Early discussion of environmental problems often urged total elimination of pollution. But as long as humans, other animals and plants continue to enjoy the processes of life, we will produce undesirable side effects. To ameliorate these effects requires consumption of scarce resources. Hence we must decide, given the costs, how much pollution we can live with, including what level and degree of sewage treatment we wish to provide for ourselves.

There is, in principle, a socially optimal level of sewage treatment. Unfortunately, no one knows what it is or has a really good idea how to determine it. EPA regulations result from political processes and give little consideration to balancing benefits and costs.

It makes no sense for Honolulu to be subject to the standards applied to most inland cities. There is a big difference between dumping sewage in the ocean and dumping it in a lake or river. At least that's what the scientists tell us.



"THE SURPLUS? OH, IT'S GONE AND I'LL TELL YOU WHERE IN MY STATE OF THE STATE ADDRESS..."