

Where I Came From

By David Venhuizen, P.E.
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I came from the other side.

The other side of what? you may be asking. And how does this matter?

The other side of The Dichotomy. The traditional view of wastewater management options is a dichotomy, defined in my dictionary as “division into two parts, kinds, etc.” Either you have an individual on-lot system—contained entirely within the boundaries of the property it serves and left entirely to the property owner to make arrangements for planning, design, funding, implementation and management—OR you hook into a centralized sewer system (the more centralized the better) that allows you to, for a fee, flush it and forget it, since some entity organized for that purpose carries out all those functions. One or the other, and never shall they be intermixed in any way. In fact, it is quite common for the two sides of the dichotomy to be regulated by entirely different agencies. Most people who are presently active in “decentralized wastewater”, the people who are largely the target audience of this magazine, have come from the on-lot—or “onsite”—side of that dichotomy. And it seems most of these people see “decentralized” as essentially equivalent to “onsite”.

I challenge that perspective and suggest that a “decentralized concept” is much broader, more holistic, more inclusive than “onsite” connotes. I arrived at that place by coming from the other side of The Dichotomy, from a consideration of how to make wastewater “systems” more fiscally reasonable, more societally responsible, and more environmentally benign, eventually arriving at an understanding that the limited choices offered by The Dichotomy are simply the two extremes of a continuum of equally valid options.

Back in the 70's, I was a solar energy enthusiast. A group of us would meet from time to time for discussions and for show-and-tell's by various presenters. One time a man named Ray Dinges came to talk to us about wastewater treatment using water hyacinth ponds, which offered a means for achieving “natural” treatment in significantly smaller ponds than are required for traditional lagoon systems. Being a tropical plant, water hyacinth will die in freezing weather, and that would significantly degrade the effectiveness of the hyacinth pond as a wastewater treatment device. Dinges suggested that the ponds be covered by greenhouses—that was the “solar connection”—to allow them to be used in areas outside the Lower Rio Grande Valley, where he had done his pioneering work on the concept. I didn't really know much about wastewater management then. At the time, I had recently taken a job with a local consulting firm—my first exposure to the world of “normal engineering”—and my first assignment had been a “Section 208” study, essentially a survey-level regional wastewater planning study. This informed me that the “modern” methods for wastewater treatment were energy-hungry mechanical plants. So Dinges' idea captivated me.

At the time, the Department of Energy had what it called a “small grants program” for people with “alternative energy” ideas they wanted to investigate. A partner and I persuaded the City of San Marcos, Texas, to sponsor the grant application for a solar powered wastewater treatment plant and to allow us to install our research facility at its treatment plant where we could draw off wastewater to

run through our experimental plant. We installed two small hyacinth ponds, each covered with a greenhouse of different design, and observed their operation. We also evaluated wind power to drive wastewater aeration. This project was the beginning of my long odyssey through the world of “innovative/alternative” wastewater management.

That association with the City of San Marcos led to me being hired as their city engineer. At the time the City was in the midst of facility planning to upgrade their wastewater system. Having observed their large-scale activated sludge plant—and having come to understand that it wasn’t only energy intensive but also inherently unstable, and thus failure-prone—I agitated for a different approach, using solar power to run an inherently stable system based on the hyacinth pond. The consultant—one of those “normal engineers”—blew me off by saying it would be too costly to cover the required pond area with greenhouses. I had considered that problem and my solution was to build the system as a series of narrow cells, operating in parallel, since long narrow-span greenhouses would be more cost efficient. I quickly realized that this strategy also had the advantage of dispersing risk, which is now recognized as a major feature of the decentralized concept. In the large-scale activated sludge plant, any problem or mishap affected the entire flow and typically led to a release of poorly treated effluent in short order. With the treatment process divided among several parallel units, a problem or mishap in any unit would affect only a small fraction of the total flow.

Then I had one of those paradigm-altering thoughts. I envisioned using this “green” strategy as a way to make a wastewater treatment plant something other than a smelly thing that had to be kept far away from people, seeing these greenhouse-covered hyacinth ponds as perhaps a feature dispersed around a park. Then it hit me—with the plant capacity being installed as a set of independent, parallel cells, **THERE WAS NO NEED TO PLACE THE ENTIRE TREATMENT CAPACITY AT ONE PLACE.** And by dispersing the treatment capacity throughout the community, a considerable portion of the collection system—facilities that did nothing but move pollution from place to place—could be eliminated, saving a large sum of money and reducing or eliminating a number of liabilities. Thus was born the idea that I have come to call the decentralized concept.

Over the next couple years, happenstance exposed me to intermittent/recirculating sand filters and the then-emerging concept of constructed wetlands—treatment technologies much more amenable to small-scale deployment than hyacinth ponds—and effluent sewer concepts. By late 1984, having left the City and re-entered private practice, driven on by the need to come up with a stand-alone wastewater management system for a development just south of San Marcos, I had assembled a “toolkit” for decentralized concept systems and a more complete understanding of the fiscal, societal and environmental advantages of such a concept relative to the conventional “big pipe” strategy. In 1985, I obtained permits from the state of Texas for two decentralized concept treatment centers as a first stage of the overall development plan. Having been asked again and again why I hadn’t just proposed a “package” plant like a “normal engineer”, I wrote a paper in early 1986, laying bare the many problematic aspects of the so-called “regional” treatment plant strategy and explaining how these problems could be blunted or eliminated by employing the decentralized concept.

Though the project for which I obtained those permits died in the massive development “bust” we experienced in Texas in 1986-87, my die was cast. I transitioned my work at every opportunity from general land development planning and engineering to focusing on bringing the decentralized concept into the mainstream, to establishing it as a legitimate organizing paradigm for a wastewater management system.

I had recognized from the start that on-lot systems could be a part of an overall decentralized concept management system. Because of the development bust, I began applying some ideas in my “toolkit” to individual on-lot systems. In 1987-88, I designed and oversaw installation of the first field production system employing a denitrifying sand filter treatment concept and subsurface drip irrigation dispersal. Thus, though I had written in the 1986 paper that on-lot systems could be integrated into an overall area-wide decentralized concept management system, it wasn’t until well after I had formulated the decentralized concept that I explicitly entered the world of “onsite”.

Because I had formulated the decentralized concept from the “system” side of the dichotomy, I understood that all facilities, no matter how they are arrayed, are all part of the overall wastewater system. It was clear to me that wastewater management need not be a dichotomy, a one or the other proposition. Rather it could be—should be—a continuum of options spanning the range between the two extremes of the dichotomy view. It was also clear that there were a number of fiscal, societal and environmental quality issues that would urge exploration of options all along this continuum.

So it is that my vision of a “decentralized concept” extends way beyond “onsite”, throughout the whole realm of wastewater “systems”. In attempting to advance this concept into mainstream practice, I have encountered all sorts of entrenched thinking and “knee-jerk” viewpoints that blunt progress toward realizing the fiscal, societal and environmental benefits of planning and designing systems at the point along the continuum most appropriate for the circumstances. Many institutional forces are at work to constrain the solutions within the bounds of the traditional paradigm, that dichotomy view, to the detriment of society, and of people in the “decentralized field” to make a living. And THAT is why all this matters.

In my writings, I examine the field of “decentralized wastewater”, pointing out how application of the more holistic decentralized concept opens up possibilities not “allowed” by the more limited vision that sequesters “decentralized” into the world of “onsite”. And also how it opens up possibilities not allowed by the “normal engineering” viewpoint that constrains what may constitute a “wastewater system”.

Perhaps a good place to begin these examinations is to question an underpinning presumption of the dichotomy view, to question just what, institutionally speaking, on-lot systems are. The traditional and widely accepted—in law, in regulation, in many aspects of practice—viewpoint is that they are simply pieces of private property, subject to a degree of regulatory oversight, much like your car. Is there any reason why on-lot systems MUST be considered strictly private property? Why are they not instead understood to be a part of societal infrastructure, something like the electric transformer box that is also typically located on private property, but is owned and totally controlled by someone other than the property owner?

Let’s back up a bit and consider the basic function that on-lot wastewater systems are meant to serve. Wastewater management is perhaps the ultimate community function. That is because the actions of any one person can have impacts—perhaps serious, even life-threatening, impacts—beyond that person’s property boundaries. This is the very reason why this function is regulated in any way to begin with. That being the case, then it could be reasonably argued that on-lot wastewater systems are—and should be—a part of the community infrastructure, just as is a central treatment plant. Is it rational, in terms of accomplishing the intended community function, to concede that a community

agent—the regulatory system—may dictate how these things are designed and may inspect their installation, but then to insist that they are off-limits to community oversight of their on-going O&M?

The reason this is worth discussing at all is that private property concerns are often a roadblock to organized management of on-lot systems, and assuring “proper” management of on-lot systems is one of the major challenges facing this field. Failure of on-lot systems is often a major reason for proposals to install “the sewer”, and that often threatens not only the pocketbooks of the property owners involved but also the livelihoods of many in the “onsite industry”—a point being made, for example, quite forcefully by the Florida Onsite Wastewater Association in its manifesto, “The Status and Future of Decentralized and Onsite Wastewater Treatment Technologies in Florida”. This choice between “onsite” and “the sewer” exists, of course, only within the confines of The Dichotomy. Under the continuum view, a whole range of options in between could be entertained, and one of those is some sort of “active” management of on-lot systems. Therefore, viewing these things as strictly private property, beyond the reach of community-sponsored management, indeed works against being able to entertain options which will expand and sustain the field which is the focus of this magazine.

I hope that this example of an entrenched presumed “truth” amply illustrates that there are many issues to be explored as we consider “decentralized”. And that is a consideration which ranges well beyond “onsite”.