

Indian Point: A Grassroots Model for Onsite Management

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Maintaining a pristine lake environment is critical to the tourism economy in Indian Point in southwest Missouri. Many tourists come to the area to fish, boat, and participate in other water sport activities. This popular vacation site, located in the Ozark Mountains along a three-mile peninsula on Table Rock Lake, is home to Silver Dollar City, a major theme park, and close to Branson, the tourist town known for its wide variety of live entertainment. On a busy summer day, more than 10,000 guests populate the village's 29 lakefront resorts.

Recent studies at Indian Point have shown that the septic tanks and lateral lines most residents use to treat and dispose of wastewater are ineffective. These systems barely filtered effluent through the thin soil before it hit ledge rock and entered the lake. In addition, phosphorus in the effluent from lakeshore development and city wastewater plants feed algae and can cloud the water. "Eliminating traditional septic systems is vital to maintaining our tourism economy, our quality of life, and our drinking water," resident, resort owner, and Board of Public Works Chair Greg Maycock said.

Looking for Answers

Since the early 1990s, a concerned group of village residents had been investigating wastewater systems. Nearly 12 years later, the Village Board of Trustees considered installing a central wastewater treatment plant based on a recommendation from the engineering firm that the village had previously contracted. For \$10 million, Indian Point could have a central treatment plant to handle wastewater from the village's 588 permanent residents and businesses with large-diameter sewer pipes laid through the area's steep hills, shallow soil, and karst geology. This advice came with a \$250,000 price tag and raised serious concerns about fiscal responsibility and user costs with some of the villagers.

"For years, Missouri, like many other states, thought that centralized sewage disposal was the way to go," resident, resort owner, and Board of Public Works member Arno Wehr said. "It's logical in large, flat areas without mountains and rock to dig into, but our geography is very different from that.

"Another problem with these macro plants is that they require operating specialists and a laboratory. You need a large tax base to support one, and Indian Point's tax base isn't large enough."

Citizen Volunteer Group Investigates Alternative Treatment Systems

Since a central sewer system was no longer an option because of its prohibitive cost, a citizen volunteer group, which included Maycock and Wehr, investigated alternative treatment systems. "We put considerable effort into coming up with a manageable, cost-effective approach," Maycock said. "A lot of our time was spent disproving systems for our area.

"We decided to look at some new advanced onsite treatment systems that could be scaled for use in both small and large cluster systems. Because our village has such diversity in its topography, geography, and density uses, the 'one size fits all' solution does not work here. We decided to adopt a consolidated approach to decentralized wastewater systems, both private and public."

Developing Rules and Regulations

Citizen volunteers, guided by Leland Neher, Missouri DNR, found that the U.S. Environmental Protection Agency (EPA) had recently developed model guidelines for managing decentralized wastewater systems.

In the fall of 2003, the village hired Elizabeth M. Dietzmann of Rolla, Missouri, an attorney who specializes in rural water and wastewater issues,

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Condos 35 yards from the natural shoreline of Table Rock Lake.

to work with the volunteers and with Stone Environmental, a consulting firm in Montpelier, Vermont, to develop a set of rules and regulations based on EPA's model guidelines for Indian Point.

"The problem with the EPA model guidelines is that rarely do you have just one management level," Dietzmann said. "More often, it's a mixed bag, and Indian Point is combining several levels of management to address its diverse needs.

"There are resorts that own their wastewater systems and fall under DNR's regulation. Then there are village-owned systems that will need to meet DNR's standards but which the village will manage. Some homeowners will own their own systems but will need to follow the village's rules and regulations for technology selection, installation, and maintenance.

"We made sure that there was a balance between individual rights and village rights—the good of the whole versus the needs of a few. By being really flexible and creative, they are going to do a fantastic job managing these systems because it is going to address the needs of every component of their community." The rules and regulations were adopted March 10, 2004 and can be found at <http://indianpoint.us/bpw.htm>.

Dietzmann recommended that Indian Point set up a board of public works (BPW). "Under Missouri law, this executive department of the village has authority to set rates, handle operations, and regulate all aspects of wastewater operations," Dietzmann said. "Normally a board of public works is created to manage traditional big-pipe sewer systems, so it was innovative to create one to manage several types of decentralized systems instead. I actually do not know of any other village or town that has created a board of public works in order to manage decentralized systems. That is one of the very unique features about this project."

Political Realities and Their Impact on a Decentralized Program

By Elizabeth Dietzmann, J.D.

The scope of the project for the Village of Indian Point, which was to create a "code" for the management of all the wastewater treatment systems in the village, was shaped in large part by political restraints imposed by the board of trustees. Under Missouri law, I could easily form a semi-autonomous board of public works (BPW), which once created, would have the to draft its rules and regulations (the code). However, the trustees were not comfortable creating the BPW until after they had approved the rules and regulations. This was a bit unusual, but unless the trustees approved the code, they wouldn't agree to form the BPW, so we had to operate under that premise.

Basically, the trustees were concerned that a code that was too hard on individual homeowners would be so politically unpopular that it would cause a backlash. In addition, the resort owners, who owned the large commercial systems, did not want duplicate regulations that would be costly—and their businesses generated the tax revenue upon which the village depended. So these were both legitimate concerns.

Most of the homeowners did little, if any, maintenance and did not pay any maintenance provider on a regular basis. The volunteers (the wastewater advisory board) who had worked for so long on the project were convinced that a permit-based management system was the only realistic way to manage a diversity of wastewater treatment systems. But the jump from no management to a permit-based system was a big one. It didn't help matters that no other city or town in Missouri had tackled the integrated management of such a diverse number of systems.

By collecting permit fees and utilizing the technical expertise of the members of the wastewater advisory board, most of who agreed to serve as the BPW, the BPW could review technology and afford to inspect systems. The main advantage that I had working with these folks was that they were willing to be creative and flexible. We had to create a code that could be adapted in the future and would manage a number of types of systems as cost-effectively as possible—and still appear reasonable to the trustees. The end result is all of those things—creative, flexible, and practical, and it serves to achieve the underlying goals: to phase out traditional septic systems and manage individual advanced treatment systems. You can read it at <http://indianpoint.us/bpw.htm>. There is no doubt that this approach can be used in other communities.

Management Program

One of the first steps the BPW took was to ban installation of new septic tanks and lateral systems. In addition, the board required that existing septic tanks and lateral systems be phased out over the next 10 years and replaced

with approved advanced treatment systems.

“The BPW conducted an inventory and inspection of systems that are not regulated by the Missouri DNR. This helps us determine which systems are going to be grandfathered and phased out in a planned manner and which systems are failing and need to be replaced within a 60-day period,” Maycock said.

The BPW plans to work with homeowners to repair, upgrade, or replace failing systems. “Some homeowners may need to replace an existing tank and lateral system with an advanced treatment system before we are able to set up a clustered system in their area. In these cases, we will rebate any monetary value the system still has, as long as the replacement system is an approved system,” Wehr said.

Owners of wastewater systems operating under a permit issued by the Missouri DNR must send copies of the DNR’s operating permits, testing and inspection reports, and other relevant correspondence to the BPW.

“Because we are a small village, we have contracted out almost everything that deals with services for inspections, operations, and maintenance of systems,” Maycock said. A licensed and certified maintenance provider must perform operations and maintenance. The BPW has the contact information for these providers. “The property owner has to show that they have a current operating and maintenance agreement for their system with an approved provider,” Maycock said. Operating permits must be renewed annually.

Types of Systems

Indian Point will be divided into proposed project areas. The village will construct decentralized cluster systems in certain areas that serve residential users. In areas where there is a mix of residential and commercial use, business owners will share in the costs of the cluster systems.



Top Photo: Stormwater retention pond with fountain in front of 18,000 gpd TVA reciprocating constructed wetland treatment plant.



Bottom Photo: Gravel media surface of TVA reciprocating constructed wetland treatment plant prior to planting.

For some areas, clustering is not cost-effective, and homeowners who are building new homes or replacing failing septic systems will need to install onsite advanced treatment systems. “We are open to new and emerging technology as long as the user can provide data that shows how the system performs,” Maycock said.



New septic systems are banned at Indian Point, Missouri, to be replaced by advanced treatment units, such as this aerobic treatment unit with biokenetic filter. Lateral lines (above) feed from the treatment unit (right). A distribution box (pg. 36 bottom and pg. 37) sends the lines to the filters (pg. 36 top).



In evaluating proposed wastewater treatment systems, the BPW will give preference to systems that can achieve, prior to distribution, effluent quality equivalent to that typically achieved by sand filters; namely, 10 mg/L or less biochemical oxygen demand, 10 mg/L or less total suspended solids, and fecal coliform 1,000 or less most probable number/100 mL.

Persistence Pays Off

Indian Point already had data showing that alternative systems were a viable option. In the early 1990s, Wehr had installed a reciprocal stone filter (also known as a reciprocal sand filter) at his Indian Point resort.

"There was a lot of resistance to this system in the beginning because the state had not approved it," Wehr said. Eventually he found support from various DNR officials and was able to install it on an experimental basis.

"The reciprocal sand filter is easy to install, inexpensive, and the effluent it produces is almost palatable and probably cleaner than most waterways in the state," Wehr said. The success of the

system caught the attention of Senator Doyle Childers, (R) Missouri. Childers was so impressed with the system that he brought the entire Clean Water Commission to Wehr's plant.

"My reciprocal stone filter was the beginning of the state breakthrough in looking at alternative systems," Wehr said. The system has worked so well that more than 100 plants just like it have been built across the U.S., in Nova Scotia, Canada, and Mexico. Wehr has even received inquiries from Europe.

Maycock installed a reciprocating wetland system at his resort based on the Tennessee Valley Authority model. Effluent runs through stone and gravel filters topped by nutrient-absorbing plants that both treat the effluent and makes the system look like a natural feature of the landscape.

"Just like the reciprocal stone filter, this system produces effluent that is cleaner than the lake," Wehr said. "The effluent is below the state limit of 0.5 in phosphorous. It is also low in





solids, ammonia, and all the other things people are worried about.”

Government officials resisted this system also, according to Wehr. “Once again, it wasn’t an approved system, and the word from the engineering firms was that it wouldn’t work. It took one-and-one-half years to get it approved. Now that we proved that these systems work, we can take the stone filter or the wetland system and incorporate them in different areas so that we don’t have any concentrations of sewage outflow into one particular bay or flowing down one particular stream,” Wehr said. He added that, to date, two multi-home cluster systems and two commercial systems have been installed, and ten individual systems have been upgraded, all through private funding.

Funding

Indian Point has not been able to find the same kind of financial assistance that larger municipalities can find through the federal and state governments. “That kind of money is very diffi-

cult to get,” Wehr said. “If we had that kind of assistance, we probably would be able to put together some very affordable systems. We have never built a profit motive into our planning or asked for grants.”

“We are in fact getting a low-interest loan from the State Revolving Fund program to construct the first cluster system the village has planned,” Dietzmann said. “It has been a frustrating experience to get our rates approved, etc., but we did get the funding commitment.”

Indian Point as a Model

Dietzmann expects other communities to look at Indian Point for guidance. “This is ‘the’ solution for the majority of rural areas in Missouri,” she said. “We are not going to sewer all of rural Missouri with traditional centralized systems, but we can take these adaptable routes.”

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