Texas On-Site Insights
Information about On-Site Wastewater Treatment Systems in Texas

Volume 4, Number 3, Summer 1995

Letter from the Editor

We hope that all the readers of Texas On-Site Insights find the information in this newsletter to be useful and enjoyable. It has certainly been a pleasure for the staff at the Texas Water Resources Institute (TWRI) at Texas A&M University to produce this newsletter for you.

We are pleased to announce that our funding agency -- the Texas On-site Wastewater Treatment Research Council -- decided to award TWRI a grant to continue producing the newsletter through August 31, 1997. This will provide us with an opportunity to continue to inform Texas residents about the issues, research advances, and challenges faced when dealing with on-site systems.

We are always looking for ideas that we can develop into feature articles. If you have an issue you would like us to cover, please contact me personally.

Sincerely,

Ric Jensen
Editor, *Texas On-Site Insights*

Texas A&M, Council, TOWA, Establish Training Center in Bryan

Specialists from the Texas A&M University System are teaming up with private on-site wastewater professionals to develop and construct a training, demonstration and performance evaluation center in Bryan.

The goal of the project is to develop a facility, the On-site Wastewater Treatment Training Center, on a 2-acre site at the Texas A&M University Riverside Campus west of Bryan. Development of the Center will be supported by a $69,000 grant awarded by the Texas On-Site Wastewater Treatment Council in August.

The efforts are led by Bruce Lesikar, an agricultural engineer with the Texas Agricultural Extension Service. Cooperators include Frank Aguirre, president of the Texas On-Site Wastewater Association (TOWA), and Clark Benson of the Texas Engineering Extension Service (TEEX). Lesikar, extension specialists Guy Fipps and David Smith, research assistant Glenn Turner, Texas A&M University student C.W. Schneider, and TOWA Training Center Committee members did most of the engineering for the site. Many

TOWA members helped plan the project and have offered to donate systems that will be used for training. Benson supervises the Water and Wastewater Training Division and will help provide on-site support and classrooms for the project. Some of the courses may be taught by TAEX and TEEX instructors and TOWA professionals.

"We feel that there is a critical need for this type of center in Texas," Lesikar says. "It will provide vital information and training for inspectors, installers, site evaluators, homeowners, and others involved with on-site wastewater. It will be a site where operation and maintenance short courses can be conducted. This project is it shows how universities and industry professionals can cooperate. We will be able to address needs of industry by using university expertise."

Texas A&M University Agricultural Engineer Bruce Lesikar (center) discusses the layout of the training center with TOWA and TEEX representatives.

Tentative plans call for wastewater from the Occupational and Environmental Safety Training (OEST) building to be intercepted before it enters the main sewer system. The treatment systems will be designed for flows of roughly 250 gallons per day. Wastewater will be first be routed into a 3,000 gallon supply tank that will be equipped with a mixing pump to prevent settling of solids and to avoid pretreating the wastewater. Effluents will then be pumped to sand filters and aerobic treatment units. Each of these technologies will be a complete system. Those units that need a septic tank for pretreatment, like constructed wetlands and sand filters, will be equipped with one. Some of the systems (trickling filters, aerobic units, wetlands, and an above ground conventional septic tank and drainfield) will only receive flows of freshwater so they can be more easily used for demonstrations. Excess wastewater from the building will be routed into the main wastewater treatment system at the Riverside campus.

Many land application systems typically used to dispose of treated wastewater will also be installed for training purposes. This includes subsurface drip irrigation, conventional trenches, low pressure pipes, a mound system, spray irrigation, leaching chambers, gravel-less pipe, and an evapotranspiration bed. These systems will be installed below grade, but access to underground components will be provided so they can be used for teaching and training. Other systems used for training and demonstrations will include removable parts.

So far, a site survey has been completed. Construction has been initiated at the site and is in full operation. The electrical service and freshwater connections have been established.

Major construction will be completed by the end of September, 1995. The facility will be ready for classes October, 1995. In the future, Lesikar hopes the site can be used for training, demonstrations, and technology transfer activities.

For details, call Lesikar at (409) 845-7453.

TOWA Insider *Provides Useful On-Site Information*

The Texas Onsite Wastewater Association offers many valuable benefits for professionals involved in the on-site wastewater industry, including a subscription to its newsletter, *TOWA Insider.* The current issue features articles that list the names and phone numbers of TOWA board members, describe key contacts at state agencies, and explain the benefits of renewing installer licenses. For details about TOWA and the newsletter, call TOWA President Frank Aguirre at (210) 509-6465.

Council Awards Texas A&M Grant to Evaluate Survey Results

The Texas On-Site Wastewater Treatment Research Council has awarded a grant to Texas A&M University to analyze survey results and prioritize research needs. The grant was given to Howard Ladewig, a program leader in Program Development and Evaluation for the Texas Agricultural Extension Service.

The purpose of the grant is to carefully analyze the results of surveys that were conducted during the Council's 1995 annual conference, and to conduct follow-up surveys to gather additional information.

"This type of work is needed because it will let the Council learn what the specific research and demonstration needs are in various parts of Texas," says Council Chairman Bill Harris. "We can use these results to issue specific requests for proposals and use the Council funds as wisely as possible."

Ladewig presented preliminary results at the August Council meeting. The results suggest that more data on soil types, recognizing system failure, and high water tables were the highest ranking research needs for conventional systems. Maintenance, sizing of systems and dealing with problem soils were the highest needs identified for alternative systems. Training, workshops, and regulations were the most needed technology transfer activities.

For more details, call Ladewig at (409) 845-7210. For a complete copy of the preliminary results, call TWRI at (409) 845-1851.

UT Report Summarizes Council-Funded Study on Ability of Caliche Soils to Treat Wastewater

A new technical report based on research funded by the Texas On-Site Wastewater Treatment Research Council assesses the ability of caliche soils to treat wastewater.

The study, *Evaluation of Wastewater Treatment Capabilities of Caliche-Type Soils*, was co-authored by Susan Parten of Community Environmental Services, Inc., and Howard Liljestrand of the Civil Engineering Department of the University of Texas at Austin. The research was conducted from February 1991 through August 1994.

The focus of the research was to conduct experimental studies and monitoring to investigate the wastewater treatment capabilities of several different caliche soils using a range of loading rates.

Experimental results from laboratory column studies showed that oxygen-demanding materials decayed over short distances in these soils. The high calcium carbonate content of caliche soils acts as a buffer and limits pH and alkalinity levels. Nitrification rates are very rapid in these soils. The low organic carbon content of caliche soils was expected to lead to lower dentrification rates than other soils with high levels of organic carbon. Nitrate levels in wastewater effluents may be the limiting factor that determine loading rates, land area requirements, or pretreatment needs prior to land disposal in caliche soils. Pathogen reduction may be another factor that needs to be considered when on-site systems are designed for these soils.

A final copy of this report was submitted to the Council in April, 1995. For details, call Parten at (512) 443-2733.

Protecting Recharge Zone is Focus of Bexar County Efforts

In Bexar County, making sure that on-site wastewater treatment systems function safely is a complex challenge. That's because of the large number of on-site systems in the County, including many older systems, and the need to protect the environmentally sensitive Edwards Aquifer Recharge Zone. This article explores some of the issues facing Bexar County and some of the innovative solutions now being used to treat on-site wastewater in the region.

Frank Aguirre (left) and Ruben Hinojosa examine this landscape that is irrigated with effluent from an on-site wastewater system in northern Bexar County.

Background Information

Currently, there are 20,000 on-site systems in Bexar County and more than 1,275 new systems are being permitted annually. This includes systems in San Antonio and 19 nearby incorporated cities and towns. On average, permits for about 30 existing systems are renewed each month.

As would be expected in any large metropolitan area, many systems are in place throughout San Antonio and the conditions are very site specific. "A major problem is that about half the on-site systems in the county serve mobile homes and other lower

income areas," says Ruben Hinojosa, chief sanitarian of the Bexar County Public Works Department. "If traditional on-site systems are not working and even if alternative systems may perform better, these low income residents can't spend the money on expensive systems."

Other problems are that many older systems were built on smaller lots and may be near the end of their useful life. A unique problem in the Bexar County area is that many people still pump their own groundwater, use too much water, and are overloading their systems. There are some old subdivisions in Bexar County that are still not sewered that still rely on septic tanks and drainfields.

Regulating on-site wastewater systems in Bexar County truly requires a partnership approach. Since 1975, the Bexar County Public Works Department has administered the on-site wastewater program. Three inspectors serve the entire county. Because the on-site staff is so small, most cases of system failures are self reported and the Department usually cannot conduct independent spot checks to see if systems are working or not. Says Hinojosa, "As a result, we have to be reactive --not proactive." The Department has reciprocal agreements with and cooperates with the San Antonio Health Department and the Edwards Aquifer Underground Water District.

Since 1975, the County has operated a program that systematically assesses and evaluates on-site wastewater systems once every five years. "We tell people whose systems are being evaluated to pump their tank, we perform an inspection, and we make sure systems are structurally sound," Hinojosa says.

The County also cooperates with the regional office of Texas Natural Resource Conservation Commission (TNRCC). They too are short-staffed and only have six employees working with on-site wastewater in a 21-county area.

Along the aquifer, eight counties individually administer their own on-site programs and each county uses its own rules. In some counties, the designated representatives often may not have the time, resources or expertise to do an adequate job of inspecting the many types of systems that are installed.

Despite the staffing limitations, the County only receives about 3 to 4 complaints each week, mainly about unlicensed systems and those that are not effectively treating wastes. Although the TNRCC regularly tests groundwater quality, there have only been a few instances where groundwater pollution from failing on-site wastewater systems has been documented.

Use of On-Site Systems Along the Recharge Zone

Along the recharge zone, the emphasis is on treatment, not disposal, because the hydrogeological setting is so fragile. Any failure of an on-site wastewater system could contaminate the Edwards Aquifer, which is used for drinking water.

Section 313 of the Texas Administrative Code requires that water pollution abatement plans be submitted for new development over the Edwards Aquifer recharge zone. Organized sewage collection systems and private sewage facilities, including on-site wastewater treatment systems, are included in these rules. The regulations require that individuals wishing to build on-site systems write a technical report that includes information on design plans and specifications and a hydrogeologic assessment.

Other "special" rules are in place to make sure that on-site wastewater systems protect water quality over the recharge zone.

Lot sizes must be at least an acre. The amount of paved surfaces or impervious cover has to be reduced to slow runoff. Soil and sand have to be imported to provide a filter medium over bare grounds before surface or below-ground discharge is allowed.

Hinojosa says that the best time for the County to become involved in regulating on-site systems is when new subdivisions are initially designed and permitted. " Once subdivisions over the recharge zone are platted, we really can't control what types of on-site systems are installed or whether on-site systems will be used," he said. "In new subdivisions, we need to decide whether we want to allow on-site units or whether we want centralized treatment systems."

On-site wastewater systems can work well, even over the recharge zone but systems that are installed over the recharge zone are expensive because of the rocky karst terrain. "It's almost impossible for a middle income family to buy land, build a house, and develop a house, and install an efficient on-site wastewater treatment system over the recharge zone," Hinojosa says.

Are on-site wastewater systems the appropriate technology to use over the recharge zone? Hinojosa says they may not always be the best solution. "In one sense, conventional sewers are easier to regulate because there are centralized treatment and collection points. It's easier for regulators to pinpoint and manage problems. With on-site systems, the individual homeowner is responsible and, once again, we're forced to react to problems that occur. Unfortunately, we can't guarantee that on-site systems won't cause problems."

Innovative Systems that Work

Even though the area faces geological and environmental challenges, there are examples of innovative systems that work well. A large convenience store near Bulverde in the northern part of the County installed a septic tank and a drip irrigation system two years ago. The system works well because it uses the treated wastewater from the system and reuse water from a car wash to irrigate the landscape around the site.

Many individual residences in the recharge zone are using innovative systems. One homeowner installed an aerobic system that will provide irrigation for groves of trees and landscape plants in his back yard. Another resident installed a conventional trench on a small site by making it wrap around the sides and back of his yard. A common practice is

to import high quality sand from Poteet (a small town in the region) to increase wastewater treatment.

Summary

Many urbanized areas of Texas face the same types of on-site wastewater treatment problems -- older lots that are too small, malfunctioning systems, and providing inexpensive, adequate treatment for low income residents. In San Antonio, the problems are exacerbated by the fragile Edwards Aquifer ecosystem and the need to make sure that on-site wastes do not lessen water quality. On-site wastewater systems, if properly designed, can function well in areas like this, although they are not always the appropriate solution for every situation.

NOTE: For details, call Hinojosa at (210) 270-6700.

USDA/ NRCS Evaluate Constructed Wetlands in East Texas

In the deep East Texas pine forests near Nacogdoches, plant researchers with the U.S. Department of Agriculture's Natural Resources Conservation Service (USDA/ NRCS) are testing the use of constructed wetlands to treat on-site wastewater, and are propagating and evaluating wetlands plants so others can use them.

Melvin Adams of USDA/NRCS checks the progress of these wetlands plants that will help treat wastewater in this constructed wetland cell. A straw mulch has been spread to help lower temperatures and plant stress.

The project is located at the USDA East Texas Plant Materials Center, which is 10 miles south of Nacogdoches in the Angelina National Forest. The efforts are led by the USDA/NRCS's Melvin Adams and Melinda Brakie. Private consultant Dan Schellenberg of Second Nature Systems in Kennard is assisting with system design and operations.

"Our idea in designing and testing this type of system is that it will be a way to introduce people in this area to the use of constructed wetlands and rock/reed filters for on-site wastewater treatment," Adams says. "We want to build a site that can be a showcase -- that people will want to come to and leave saying that this type of system may be for them. Eventually, we think this may be a technology that may be commonly used in much of this region. That's because of the prevalence of tight clay soils and high water tables that cause traditional systems to fail."

System Design and Implementation

Near the USDA/NRCS headquarters building, Adams and Schellenberg have established two very attractive wetlands cells. The system is designed to receive an average hydraulic loading of 80 gallons per day during normal operation, based on wastes generated by the three-person NRCS staff and an estimated 10 or more visitors a week. Biochemical oxygen demand (BOD) loadings are estimated at 0.6 pounds per day, and the average BOD levels from the septic tanks to the treatment cells are estimated to be 165 milligrams per liter mg/L. The site contains two 500 gallon septic tanks and the second tank has a screen to trap solids.

The dimensions of each wetland cell are 17' x 16'. Cells are enclosed by a treated wood berm and are sealed with a commercial poly/nylon liner. The systems were filled to a depth of 16," with rocks ranging in size from 0.5 to 3 inches. Wastewaters are intended to flow at least 2" beneath the surface and detained for roughly 15 days. Wastewater enters the system from the second septic tank and flows by gravity through a "T." Perforated 3/4" holes were cut in the PVC distribution pipe to let effluents flow uniformly throughout the cells. A water level control box between the two wetlands cells can be used to stop the flow from one cell to another whenever maintenance is needed. Side slopes in both cells are 2 to 1. The system is designed so that highly treated effluents are chlorinated and will flow into a conventional drainfield after heavy rains.

Schellenberg says the system will still be effective in Winter months because the roots of bulrush and cattails will continue to transfer oxygen to support microbial species that will provide wastewater treatment.

System Performance: Preliminary Results

This April, the team planted both wetlands cells. Originally, the first cell was planted with such hardy plants as cattails, soft-stem bulrush and pickerel weed. This is because these marshy plants bleed oxygen, and can handle wastewaters with high BOD and low pH levels that come directly from the septic tank. Eighteen cattails were planted in the first cell and so far only three of them have died. Both the cattails and the bulrush should perform well if their roots are constantly kept under water. However, many imported miniature cattails that were planted in the first cell did not survive because they were too fragile. In July, USDA/NRCS staff planted more bulrush in the first cell.

In the second cell, where nutrient loads should be much lower, Adams and Schellenberg planted pickerel weed, bulrush, elephant ears, powdered thalia, and woolgrass. This summer, they hope to plant more colorful species including varigated taro and yellow snowflake. In the future, candidate species could include such attractive landscape as canna lilies and irises.

The goal was to provide a landscape that would be attractive and functional. One idea being implemented is to provide a "stadium effect" with taller plants like cattails installed at the back of a cell, midsize plants like bulrushes in the middle, and smaller plants

including miniature ornamental cattails in the front. This will provide a functional wetlands cell and will let visitors see all the different sized plants at once.

Adams says that the performance of the system has been exceptional in improving water quality. Effluents exiting the first cell average less than 5 mg/L for BOD and total suspended solids (TSS) are less than 1 mg/L -- which is far below the permit requirements. Typically, most wastewaters will evaporate before exiting the cells.

There have been some problems, however. First, the process to permit the system through the Texas Natural Resource Conservation Commission was expensive. The regulations for innovative systems can increase costs because they require detailed site studies and the use of a professional engineer. A leak in the water level control box severely decreased the amount of water in the system and stressed the plants. This has been fixed. Successfully getting newly transplanted species to survive and grow was difficult. Because of the leak, they often didn't get enough water. The rocks used as a media became so hot that they were another source of stress. As a result, straw is being applied as a mulch to reduce temperatures and evaporative losses. Finally, the wastewater coming into the site may be too low in nutrients to make the plants grow as well as they should.

Propagating and Evaluating Wetlands Species

Another major activity at the site is the propagation and evaluation of wetland species. Three years ago, Adams and his staff planted large 25' x 70' cells with a variety of wetlands plants including cattails, elephant ear, giant cutgrass, and woolgrass. Groundwater wells at this site provide enough water to grow these plants in 6" to 12" of water. These experiences are helping the staff find the best ways to make individual species grow and flourish in East Texas conditions.

Results from these trials will benefit the public in two ways, Adams says. First, researchers at the site will be able to provide better advice about how to propagate and manage wetlands plants. Also, non-profit agencies and others may be able to take plantings from the site for use in their own areas.

Note: For more information, call the Center at (409) 564-4873.

NOWRA Fact Sheet Makes It Easy to Record Essential Data

The National Onsite Wastewater Recycling Association (NOWRA) has published a new fact sheet to help homeowners manage their onsite wastewater systems. The fact sheet, *Homeowners Septic Tank System Guide and Record Keeping Folder*, is a form that lets users record such information as when permits were issued, the installing contractor, and the septic tank pumper. The form makes it easy for homeowners to record the size and dimensions of the septic tank and drainfield, to diagram system design, and to note when maintenance was performed. For more details, call NOWRA at (800) 966-2942.

NOWRA National Meeting will be Sept. 15-17 in Tacoma

The National On-site Wastewater Recycling Association (NOWRA) will hold its annual conference September 15-17 in Tacoma, WA.

The meeting, titled "Marketing On-site Technology," will include papers on innovative products, adopting new technology, the impact regulatory codes on the use of different on-site systems, and need for developing training for regulators and professionals in the field.

For details about the meeting, call NOWRA at (800) 966-2942.

GAO Study Focuses on Alternative Wastewater Systems

The U.S. General Accounting Office (GAO) has published a report dealing with alternative wastewater treatment systems. The report, *Water Pollution: Information on the Use of Alternative Wastewater Treatment Systems* (GAO/ RCED-94-109) was published in September 1994. The purpose of the report was to determine if costs of wastewater treatment can be reduced by using alternative treatment systems, to examine if there were cost-effective alternatives to conventional systems, and to assess how the U.S. Environmental Protection Agency is helping develop future technologies.

The report suggests that alternative systems for collecting and treating wastewater offer the potential for cost savings in some circumstances. Alternative systems were identified as being especially viable for small communities that may not be able to afford conventional centralized sewers.

The report identified two types of systems as being the most promising: alternative collection systems that use small-diameter pipe buried at shallower depths, and constructed wetlands and land disposal systems that use soil, vegetation and aquatic environments for treatment.

The report can be ordered by calling GAO at (202) 512-6000.

Subdivision Residents Near Dallas Choose Small Diameter Sewer to Remedy On-Site Wastewater Problems

For many years, residents of Point Royal Estates -- an 80-home subdivision near Lake Ray Hubbard -- suffered as their septic tanks and drainfields failed. As a result, raw or partially treated wastewater was flowing through alleys, many homeowners were unable to use their bathrooms or invite guests over during wet months because of perched water tables, and property values sank.

Now, things are beginning to change for the better. Many of the people living in neighborhood got together, discussed potentially viable technical options, organized and got things done. The ultimate solution was to install a small diameter sewer. So far, area residents say the system works great.

Workers install this small diameter sewer in Point Royal Estates. The sewer replaced conventional systems that were failing.

"The real story about Point Royal," says Bill Tenison, the president of Oxytec Environmental Group, Inc. in Dallas, who constructed the system, "is that this is a story about the process residents in a neighborhood went through to learn about, evaluate, and eventually decide what system may work best for them. In that sense, this process is an example others may want to emulate."

"Technically, we believe the small diameter sewer is the best affordable engineering solution for this area and that's also important," said Ken DeJarnett of RTD Associates of McAllen.

Problems with the Original System

Point Royal Estates is located in the northwest part of Rockwall County on the western shore of Lake Ray Hubbard. The lake is a source of drinking water for Dallas County. The area was developed in the early 1970s. It consists of 96 residential lots -- most of which are less than a half acre in size. Originally, each of the homes was served by two 250-gallon septic tanks, and gravity absorption field lines were placed in the back yards.

As could probably be expected, most of the systems failed regularly. For example, soils in the area are mainly extremely tight clays and infiltration was a problem. Many residents had to pump their tanks as often as twice a year and still reported systems were failing. Some homeowners resorted to renting "port-a-potties" for guests to use during the holidays. Even after residents had installed additional field lines, cases were still regularly reported that dealt with foul odors, saturated soils, and possible fecal pollution of Lake Ray Hubbard. Many real estate agents told homeowners that the value of their homes was sinking, if they could sell their homes at all.

In 1990, the City of Rowlett formed a Public Improvement District so that a conventional sewer system could be installed in Point Royal Estates. This entailed a central collection system that would send water to Rowlett's main sewage collection pipe. The original cost estimates to install this system was less than $4,000 per household, but the final engineered cost was nearly $10,000 per residence. Because of the high costs and the fact that Point Royal would have to be annexed into Rowlett, many residents decided that other alternatives needed to be explored.

Residents Organize, Investigate Alternatives

In 1993, the Point Royal Water and Sewage Supply Corporation (PRWSSC) was formed by a volunteer group of homeowners in the development.

After a series of public meetings was held to vigorously discuss the alternatives, it became obvious that a small diameter sewer may be the best option for the subdivision. A hurdle occurred when Point Royal residents discovered the Texas Natural Resource Conservation Commission (TNRCC) did not have any regulations in place that covered small diameter sewers. That was because no small diameter sewers had yet been built in Texas, even though they were common in other states. As a result, it took a considerable amount of time and effort to prove to the TNRCC that this technology was feasible and that specific designs were justified. Finally, in 1993, the members of the Corporation had to vote to approve the design and construction of the small diameter sewer as the best option for their area. The vote was an overwhelming yes. RTD Associates Corporation was awarded the contract to design and permit the system and Oxytec was awarded a contract to construct it.

"We held a series of regular public meetings from 1993 to 1994 that were attended by as many as 75 of the subdivisions 86 homeowners. At first, it was very difficult for people to know what the best option was, in large part because few of the experts at State agencies had dealt with small diameter sewers before," says Point Royal Corporation President Lupe Martinez. "Even after it became obvious that small diameter sewers may be our best choice, we still had to convince homeowners that they should spend the money to install these systems on their lots." TNRCC approved design plans for the system in April 1994, and the first home was connected in July 1994.

Design Considerations and Construction Experiences

One of the basic elements of this small diameter sewer is that gravity -- not energy -- should be used to convey the wastewater from one site to another. For that reason, detailed topographic surveys were conducted and hydrologic units were identified to take advantage of the contour of the site. Hydrologic spreadsheets were developed to calculate design flows, the percent slope for each section of pipe, and the velocity. Generally, the engineers decided that no section would have more than a 50% flow in pipes during peak periods. This excess capacity allowed for a less than normal slope and for small diameter pipe to be used.

Main collection lines in the system are a minimum of 3" diameter PVC pipe. Lines were placed in streets rights-of-way and were generally placed on both sides of the street. This allowed lines to be installed in ditches that are at least 3 feet deep.

Interceptor tanks ranging in size from 1,000 to 1,200-gallons were installed at each residence. The tanks were equipped with baffles and Clemson design tubes to prevent solids buildup and to reduce the amount of sludge sent to wastewater treatment plants. Homes were connected to the interceptor tanks by 4" PVC pipes on a 2% slope. These

tanks substantially reduce the amount of solids that has to be carried in the lines and allow for small diameter pipes to be used. Existing septic tanks were abandoned and crushed, when practical.

Effluent was transported from the interceptor tank to the collection line by a 2" PVC gravity flow line. Valves and cleanout ports were installed at most homes that can be easily accessed and serviced.

Ground-breaking for the system occurred in April 1994. Oxytec, Inc. was the general contractor for the installation. The project was divided into topographical sections so that collection mains could be installed, tested, and tied into Rowlett's manholes. By the end of 1994, all sections were installed and 76 of the 79 residences that subscribed to the new system were connected and operational. Seven homeowners chose to not join the system. Three other residences were connected in early 1995. The total cost for designing and installing these systems was less than $3,500 per home. Final inspections were performed in July 1995 and no operational problems have yet been reported. Since the new system was installed, one realtor reported that home values have jumped by 25 to 40%.

Conclusions

This is an example of a group of homeowners who faced property devaluation, unacceptable living conditions, and public health hazards. They joined together to work towards solving these problems.

This situation can be used as a model for other communities in Texas facing similar circumstances. The experience of the design team, the regulatory review process, and the ultimate operation and performance of the system, should be applicable in other instances.

Perhaps equally as important, the Point Royal experience shows that residents can solve on-site wastewater problems on their own, if they are willing to commit time to learn about, discuss, and reach a consensus on these issues.

NOTE: For details, contact Bill Tenison at Oxytec Environmental Group at (214) 979-2488, or Ken DeJarnett at RTD at (210) 630-3511.