

One of four aerators that provide a supply of oxygen in the lagoons which the bacteria need to do their work of digesting the sewage.



This pump forces the treated effluent through irrigation pipes into the wooded spray field after sewage has been treated by air, sun and bacterial action for 40 days.

**I**N AN AGE of increasing public alarm over the harmful effects which domestic and industrial pollution are leaving behind us, a group of ecology minded developers and engineers have teamed up with industry, science and Mother Nature to employ a unique sewage disposal system which currently serves 1500 homes at St. Charles without polluting either the waterways, the land or the air around the community.

One of the nation's latest new communities, St. Charles is located only 20 miles from Washington, D. C. on an 8,000-acre tract in Charles county, Maryland. This new concept in community living, has been developed to provide better living conditions by master planning the residential, commercial, recreational, industrial, educational



One of several hundred spray nozzles that shoot effluent from the lagoon system into the air over 50 acres of woodland. The trees thrive on it.

## Man And Nature Working Together

"Spray irrigation" is one of the most unique developments in sewage disposal yet. Combining sprinklers and sewage effluent, this new technique is a solution to pollution that today has application in our forests — tomorrow on turf, maybe your turf.

and governmental areas and locations in advance. In a nutshell, St. Charles is a community designed for superior living through superior planning. Its system of domestic sewage treatment is only one example of how superior planning can pay off.

St. Charles already has 1500 residential units in existence and is designed to grow over the next 20 years into a bustling community of 75,000 residents. Its effluent will ultimately go into a major interceptor sewer and treatment plant to be built by the county under a Housing and Urban Development grant. To meet the interim needs, it was decided six years ago to seek a method of sewage treatment which would meet present and future health standards—the sewage lagoon

system.

The system of pollution-free sewage disposal being used by St. Charles, termed "spray irrigation," is unique in Maryland, and is one of only a handful like it in the entire nation. It employs nature's own methods, which are probably the oldest, least expensive, and still the most effective known to man, along with considerable assistance from scientific know-how. Interstate General Corporation, the developers of St. Charles, have succeeded in a way which undoubtedly will be copied by other communities looking for pollution-free interim solutions to the ever-growing sewage problem.

The sewage lagoon system was created by a team of scientists from  
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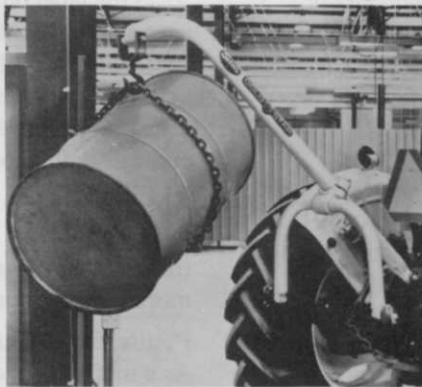


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## MAN AND NATURE WORKING TOGETHER

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the University of Pennsylvania nine years ago. They developed a workable system of sewage disposal which would help communities avoid having to build costly treatment systems and then still having to pollute rivers and streams with the effluent. The team decided to let Mother Nature help in their efforts by using the land disposal method of sewage treatment. With a few new twists, they finally settled on the method now being used so successfully by St. Charles. "This system can be built at one-fifth the cost of conventional sewage treatment plants," said IGC president James J. Wilson, "and it can be operated, along with the community water supply at St. Charles, by only four men."

Many experts from other areas interested in the field of waste treatment and disposal have already been to St. Charles to see how the sewage lagoon system works. Now that legislation concerning sewage and pollution problems is pending, Congress is leaning more and more to the safer, less polluting methods of waste disposal, namely, the use of land as the prime means of disposal rather than rivers and streams.

Under guidelines set up by the Environmental Protection Agency, the U. S. Army Corps of Engineers has been made responsible for policing the nation's waterways. For that reason, and to learn more about the land disposal method of spray irrigation, their representatives have seen the St. Charles lagoons in operation.

In addition, interested representatives from such diverse groups as the Maryland State Water Resources Administration; the Montgomery county (Maryland) Council; several consulting engineers and even the American Public Works Association Research Foundation have singled out the St. Charles sewage lagoon system as being typical of the most effective land disposal method of sewage disposal.

Sewage from the homes in St. Charles and its two schools flows through traditional sewer lines into a system of lagoons covering twenty acres near the eastern boundaries of St. Charles' 8,000 acres. The first two lagoons into which raw sewage flows are equipped with four large aeration devices which continually churn the sewage water, adding oxygen. The aeration provides the oxy-

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## MAN AND NATURE WORKING TOGETHER

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gen needed by tiny organisms which literally eat and dissolve the sludge. St. Charles Utilities officials state that in six years of lagoon operation, less than three inches of sludge has accumulated on the bottom.

From the aeration lagoons, five feet deep, the waste water is pumped to other lagoons where further cleaning takes place. There, assisted by sunlight and air, the bacteria, ever present in ground and water, take over. In a matter of days, the water quality is markedly improved.

By this time the water Biochemical Oxygen Demand (BOD) content is reduced to about 25 percent of influent and the percent of dissolved oxygen has increased from zero to about 60 to 80 percent. The treatment process takes about 40 days after which time the water is drawn off by pumps and sprayed into the nearby woods in much the same way that nearby golf courses are irrigated.

Pumped 20 to 30 feet into the air, the water falls like a gentle rain over the woods, thus further aerating the effluent. The 50 acres of

woodland used for spraying has a sandy-porous soil and a leaf mulch cover which acts as a living filter. Earth bacteria work on the water exactly as they do on rain. Needless to say, the woods thrive on this watering process. By the time the waste water has been sprayed and passed through this living filter all BOD and suspended solids have been removed. Waste water quality approximates drinking water.

Interstate General Corporation (IGC) officials advise that the St. Charles lagoon spray system now uses 40 acres of land for the storage treatment process an increase of 20 acres over the original design. Additionally, portions of 100 acres of surrounding forests utilize about 750,000 gallons of effluent a day from St. Charles.

The City of Muskegon, Michigan considers the system so effective that they will soon initiate a new sewage lagoon system to provide for the entire population of their city, handling a load of over 45 million gallons per day.

Tests by the Maryland State Health Department and by a firm of chemists employed by St. Charles Utilities to keep a constant watch on the system's operation, show absolutely no signs of run-off into

nearby streams nor any pollution whatsoever, even odor, from the system.

According to James J. Wilson, president of IGC, "The system now being used at St. Charles has proved itself beyond all expectations. Twice the current sewage level could be absorbed by the system, but we plan to double the size of a nearby system for expanded treatment and storage as the community grows larger."

Wilson regards the system as semi-permanent—at least until the major treatment plant has been built, since it is adequate for the community's needs.

Do the lagoons have any other use except as waste treatment facilities? The answer is a decided "Yes." A family of swans took up residence on the lagoons at St. Charles several months ago. The lagoons also have a migrating colony of ducks who apparently find the wetlands of the South no more comfortable in the winter than the man-made lakes of St. Charles. In addition to this wildlife, classes in water pollution abatement technology at the Charles County Community College use the lagoons as a laboratory and conduct tests which St. Charles engineers study in operating the system. □

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