

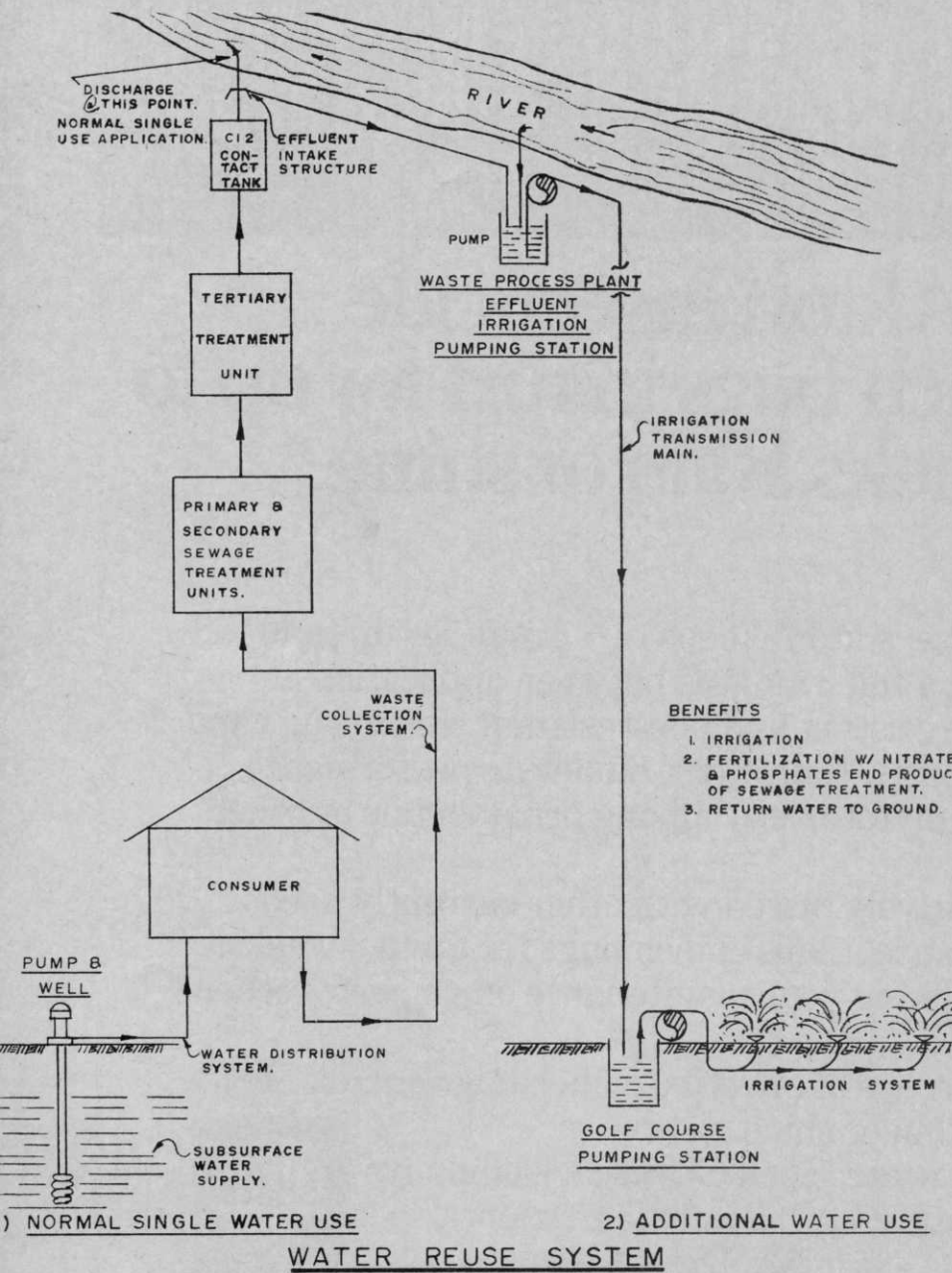
Consulting engineer Richard J. Jeske prepared the schematic below to explain how Panther Valley CC's water reuse system works. Pictures above show what the key facilities

look like. From the left are the "Hydro Clear" tertiary treatment unit, the golf course irrigation pumping station, and the processed waste pumping station.

GOLF COURSE IRRIGATES WITH 'USED' WATER

Source Is Community's Sanitary Sewage System

By ALBERT S. KESHEN
Plainfield, N.J.



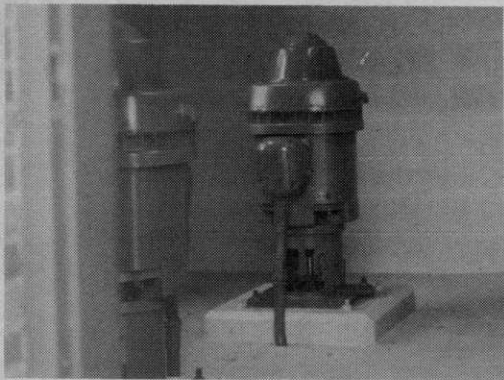
SANITARY SEWAGE disposal design to tertiary stage with treated effluent circulation for irrigation of the swanky golf course of the Panther Valley Country Club, Allamuch, N. J., has resulted in these benefits:

1. Built-in liquid fertilization from the natural water supply source.
2. Assurance of ample water at all times without worry over any possible drought or municipal bans.
3. Conservation of the water supply through recirculation of the water in this reuse system.

Panther Valley is an expansive residential community developed in a mountain setting in an isolated area in the northwest section of the state about 60 miles from New York City. A former 2,000-acre country estate has been converted to a \$65 million new community of townhouses, apartments and luxurious homes that will eventually provide country living for 2,000 families.

The 18-hole, well-trapped golf course, was designed by Robert Trent Jones, internationally-famous course architect. Early in the planning stage it was realized that the 60-acre course, measuring 6,850 yards from the back tees, required 250,000 gallons of water a day for irrigation. A normal well system would only yield 100,000 gallons of water daily, which means a deficiency of 150,000 gallons.

Water supply comes from the Pequest River and a lake on the course which is fed by springs and runoffs in the area. The lake requires constant replenishment. Fur-



This is the interior of the waste pumping station.

thermore, the normal primary and secondary treatment of water for purification would not be sufficient since a state fish conservation and hatchery is close by and the authorities warned that standard waste treatment might endanger the ponds.

Faced with this problem, Panther Valley's consulting engineer, Richard J. Jeske, Springfield, N. J., developed his concept of the tertiary treatment through an aerated sand filter. The water is purified through primary and secondary sewage treatment units, then piped to a tertiary unit for final purification. Instead of being discharged into the river, the water is piped over and over again into the main irrigation pump in the center of the course with eight sprinklers distributed to assure adequate irrigation. There are 8,000 feet of pipe from the irrigation pumping station at the sewage plant on the premises where the effluent is treated to the irrigation pumping station at the golf course.

When the community is fully occupied this system will handle 800,000 gallons of water daily, of which only 250,000 will be required to irrigate the golf course.

"Our objective of cleanliness has been achieved through this means," said Chris J. Cerullo, manager of the Pequest Water and Sewer Companies which operates the sewage treatment plant with capacity to serve future construction outside Panther Valley. "As a test we filled a six-foot tank with this treated sewage and were able to see clear through to the bottom."

Under this recirculation system, the water goes back into the sub-surface strata and can be used over and over again for well water and irrigation purposes.

Another big advantage of this sewage treatment is the retention of the fertilizing elements in the water, thus cutting down on main-

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tenance costs, since less commercial fertilizer is required. Although all used water to be discharged into rivers must meet the standards set by the Federal Water Pollution Control Act of 1965, there is a provision that this used water still can contain nutrients in the form of nitrates and phosphates that are the main cause of algae in rivers, streams and lakes. But, with the reclaimed water at Panther Valley being used for the irrigation of the golf course and some of the balance being made available to black dirt farms nearby, the natural water reservoirs near Panther Valley will remain unpolluted, especially during the summer months.

Since the used water contains nitrates and phosphates that have a nutrient value at a pH close to seven, the golf course is being irrigated with a form of built-in liquid fertilization. This factor, according to Leonard Schilling, grounds superintendent, will prevent disease such as dollar spot and brown patch, as well as reducing the expense of purchasing additional fertilizer and labor costs in applying it.

"Turf has been mainly seeded by our own staff," said Richard Hughes,

golf pro. "We've used Merion blue grass with reseeded of Astoria, Seaside, and Penncross bentgrass on the fairways, tees and greens; then cut low to eliminate bluegrass to make it all uniform. Kentucky bluegrass is for the rough. We water in 10- to 12-hour cycles. With the improved irrigation system, we're always assured of a course that's green and lush, even the rough."

The reused water that is not applied to the golf course and the nearby dirt farms is being used to create ponds and lakes. "These artificial reservoirs are half used water and half fresh water," said Philip Barske, Panther Valley's conservationist. "The water purification system can also be used to irrigate the millions of dollars worth of lawns, trees and shrubbery within our 2,000-acre complex during the dry periods."

Engineer Jeske, although satisfied with the results attained, does not claim that he has worked out a panacea for all irrigation problems. He points out: "It has worked out well for our particular set-up and could be applied to other fairway-living complexes, or even golf courses near a municipal sewage

treatment plant, provided a tertiary treatment unit has been installed. It costs \$60,000 and those miles of piping and booster pumps might not be required on other projects to get the water to the main pumping station. In certain areas where water is scarce and costly, the system could conceivably be ideal because the piping and pumping costs would be less than for the price of water itself."

Taking the long-range view, however, Philip J. Bowers, II, president of Panther Valley's development company, appeared well satisfied with the investment outlay of his water sewage system. "We won't have to be concerned if there's a drought or worry if the municipal council passes an ordinance cutting back on our use of water," he said. "The reused water is free, which is quite a savings since it costs almost \$21,000 yearly to irrigate a course in northern New Jersey whereas our only cost is pumping and that only runs \$3,500 a year. Moreover, the long-range view, which we are striving for has prevailed. It's all in accordance with our philosophy that 'only excellence will survive'."

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