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Customs sizes made to order-allow 6 weeks.

# JEPCO NEWS

SUMMER

by Ed Pennypacker

2005

## When It Breaks, We Fix It

In Pennsylvania, there is a site where raw sewage is flowing across the ground and downhill into a creek feeding the Philadelphia water supply. 100 years ago the area was dotted with country retreats for city people looking to escape the heat. Now the cabins have been enlarged to four bedroom homes on quarter acre lots. An old "tank" remains uncovered to allow for weekly pumping. Two teenagers and two adults conserve water by taking two minute showers and only flushing when absolutely necessary. I can fix it. A



Small narrow site . Blue tarp keeps rain out of tank which requires weekly pumping

new two compartment 1250 tank, flowing to a two compartment pump tank, which recirculates through advanced filtering technology can yield an effluent nearly as clean as swimming pool water. Using UV and/or chlorine we can put out nearly drinkable water. The soils are poor, so we would have to dispose of the water by irrigation, surface discharge, or perhaps construct a decorative wetland setting to allow nature to aid in the process. Sorry, not in Pennsylvania. Even though the homeowner wants to fix the problem, outdated regulations written fifty years ago stand in the way. What is allowed is for the system to continue to pollute.

Eric Murdock, P.E. works for the city of Syracuse. His job



Eric Murdock explains. Despite being too close to the house and too close to property lines, it works. The drainfield is under the driveway.



Coils of textile and peat receive aerobic effluent which re-circulates.

is to protect the waters of Lake Skaneateles, the water supply for the city. Eric has Federal money to spend on emerging technologies. Since New York does not force the same standards for repairing a system as for new systems (unlike PA) he is able to fix the problems he encounters.

Above is a filter system that re-circulates effluent through a textile/peat combination filter. On a timed dosage basis, the very clean effluent is pumped for dispersal into the drain field under the driveway. Under old-fashioned prescriptive codes, none of this is allowed. The system is too close to the house and the property lines. The old system was failing, the new system produces clean water. There are 2300 homes around the lake. 300 are on city sewer, 75 have composting toilets, and the rest have various onsite systems. There are restaurants and other businesses just as you would expect. Each of them is a potential threat to the clean lake waters. One site uses three open bottom peat filters for sewage treatment. Effluent is monitored and it is clean. Another site had failing seepage pits (below), Eric's team added a shallow drainfield by overlaying the existing soil with perforated pipe and sand. Using modern technol-



Small lots along the lake present unique challenges. Here a shallow drainfield provides final treatment of sewage pre-treated by advanced aerobic systems. This lot used to have failing seepage pits. Now the closely monitored system does not pollute the clean lake waters.

ogy, the septic tank pre-treats the sewage from the house. Solids, settle and are digested. Fats and grease float, the middle layer is treated biologically by anaerobic bacteria that digest and reduce the bio-load. The second chamber of the tank is a pump chamber (STEP System) that repeatedly re-cycles the effluent through packed bed



Special filter/screen in STEP chamber keeps solids out of the drainfield. All tanks need an effluent filter.

media to aerate and clarify the sewage. This treated effluent when returned to the pump chamber mixes with the anaerobic sewage. Thereby nitrogen is reduced in the effluent. (Nitrogen is a major cause of algae growth.) On a timed basis, the field is dosed with treated sewage. Bacteria counts are greatly reduced and final treatment in the soil virtually eliminates all pollutants. Eric is able to perform these miracles because: First, he knows how to do it. Second, he has the co-operation of the local county officials. Third, he has a budget to do it right. If there is a problem, (there almost always is) he works until the system works as planned. With all advanced technologies there is need for professional maintenance. Once you add pumps and alarms the potential for disaster increases. Eric's team monitors and maintains each system. High water alarms mean something is not working



Accessible inspection ports allow monitoring of the shallow drainfield's performance in the lakeside onsite system.

properly. Too much flow means there is a leak, or a running faucet or running toilet. Catching the problem early saves the system from failure.

Understanding the complexities of so many systems is in itself a major accomplishment. Making them work, is the real test. His systems work. Fortunately,

New York recognizes that "legacy systems" have to be treated differently than new construction. There are many old systems around the state which need attention. Thankfully, New York allows Eric and others like him to fix it when it breaks.

Eric Murdock, P.E.

City of Syracuse, Watershed Protection  
315-473-2629



Despite heavy rain, PCANY hosted tour learns about drip dispersal on the shore of Skaneateles Lake.

## PCANY CERTIFIED TANKS

Concrete Products and The Installer, tout the Certification Program in New York State. PCANY (Precast Concrete Association of New York) has adopted strict standards. Listed producers, working with an engineer licensed in New York State, submit detailed drawings, including reinforcement, dimensions, and design strength. The engineer witnesses production practices and evaluates QA/QC procedures. Most importantly, the engineer witnesses the actual testing of the tanks for watertightness and structural soundness. ASTM C-1227 describes the accepted test methods. While water testing is allowed, most are tested by vacuum. Similarly, a high level of vacuum loading is used to prove structural soundness. Red "Tags" of plastic disks are cast into tanks made by listed companies. Annually, producers must resubmit to maintain listing. Sunnycrest, Auburn, NY, is a listed producer. Tony Pacini says, "We know our tanks do not leak. We test every single one of them before they leave the shop. If there is a problem, we fix it right then and there. Our customers never have to deal with it. Not all tanks are created equal. The amount you put into our tanks is the amount you get out." Engineers and inspectors now look for the red tag when the tanks show up at the job site. Each Sunnycrest tank is shipped with a certificate that documents the testing. "We don't just claim to make watertight tanks, we prove it." Carl Buchman, Executive Director of PCANY states that it is a goal that no tank be installed anywhere in the state without passing the certification requirements.

## VACUUM TESTING

There is no faster, better way to assess the quality of a septic tank than to subject it to vacuum testing. An inch of negative pressure (vacuum) is equal to 72 pounds per square foot (PSF) of exterior pressure. Pete Kegler, of L.G. Wheaton Inc, North Windham, CT uses a fancy shop vac. To find it, he drilled a hole in a hockey puck, installed a vacuum gauge and went shopping. When he found one that would draw 7 inches Hg he bought it. When he wants to test a tank, he connects to his system and draws a vacuum in seconds. Ira Rosenberry uses a rig made from a vacuum pump from a dairy farm milking parlor. He clamps the hose on his pump into the pipe seal on the end of his tank. It is electrically driven so it is fairly quiet. Noise can be a problem. It is difficult to test with a loud pump covering the sound of a leak. ConSeal has a gas-powered rig made by Cherne. It is portable and has seen wide use over the years, proving the quality of their butyl gaskets. But, it is so noisy, that I have to bury it



under styrofoam to deaden the sound.

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Safety is always a concern when vacuum testing is used to prove structural soundness. Water tight-

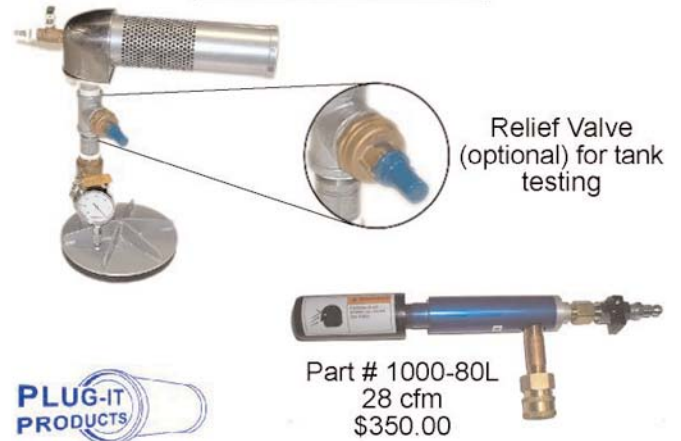


ness testing only requires 4 inches Hg, a load easily endured by concrete tanks. (most plastic tanks crush at 4 inches Hg). PCANY requires at least 7 inches Hg to show a tank is suitable for three feet of burial when a 1.5 safety factor is employed. Deeper burial requires higher loading. I have a video tape of a tank flying into pieces at 11 inches Hg. Luckily, no

injuries. But someone could easily have been killed by the flying chunks. 10 inches of Hg is 720 PSF. Equivalent to six feet of burial in many locales. Soil puts the bulk of the load on the lid, the sidewalls only get about half the load. But in vacuum testing, the sides, bottom and top all get the same load. When it breaks, it is usually because a sidewall gives way. Imploding a tank under high vacuum can be very dramatic and dangerous. Be Careful!

JEPCO sells the plug-it kit that makes fast work of the testing procedure. Hook the venturi pump to a compressor and draw a vacuum. The larger one (\$918) is faster. It is suitable for either tanks or manholes. The smaller one (\$350) is slower but equally effective for

## TANK TESTING



tank testing. Padded plates come in various sizes from 12 inches to 42 inches. A 26 inch plate (\$1,075) covers a 24 inch opening. Gauges are the big variable. Testing tanks at 4 inches to 10 inches of Hg calls for a gauge that reads between 0 and 10 inches of Hg. Most gauges are 0-30 Hg. JEPCO has custom made 0-10 gauges for \$120 each.

Call for a quote on a system to suit your needs.

## CHAMPION PUMPS

Champion Pump will sell directly to precasters. Buying a Zoeller BN153? Champion's equivalent CPE5-12 is \$156.75. Buying a Hydromatic SHEF50M1? How about Champion CPEH5-12 for \$393.25. The pumps are cast iron construction with inboard seals, permanent split capacitor motors, with many options. Sump pumps, effluent pumps, and grinders from 1/3 hp through 2 hp. Specify cord length, auto controls, control panels, piggy back switches, and simplex or duplex packages. Call for pricing, just list the specifications needed or the competitor's model numbers and get factory direct pricing.

## FORTA FERRO STRONG AS STEEL

PROVE IT! make a tank without steel, use 5 lbs fiber per yard, and test it at high loading with a vacuum. Forta Ferro easily disperses in the mix. No "fuzz balls."