

# They didn't teach me this in turf school!

BY SCOTT BELL

A few years ago, Florida law mandated that I have monitoring wells installed around my fuel tanks in order to watch for groundwater contamination from the underground fuel storage tanks that we used to fuel the equipment.

Immediately after installation, our monitoring wells showed evidence of fuel in the samples. Upon notifying the local DER/HRS representative, my fears were quickly confirmed by him.

After discussing the matter with the club officials, the decision was made to convert to an above-ground system as quickly as possible.

We decided to install the Convault double-walled, concrete-enclosed tanks because of the obvious durability of the tanks and our desire to never be in this situation again. We were given a fair period of time to remove the suspect underground tanks which helped to spread these large expenses over a longer period of time.

The DER representative that I worked with was fair and reasonable and I responded by affording him the same consideration. I'm sure that my being cooperative with the DER official helped the situation and it helped get us a reasonable amount of time to remove the tanks.

In retrospect, I think he knew better than I the large expenses we would be incurring to remove the tanks, so I think he gave us time between the installation of the new tanks and the removal of the old tanks.

When we finally had the fuel tanks removed, contaminated soil and groundwater were found.

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The staff from Brevard Oil Equipment showed up to remove the tanks and, shortly after breaking through the concrete, they found that the soil was contaminated.

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They started digging on Tuesday and they did not stop until Thursday night.

We had to go to Scotty's to buy plastic to line the ground so we could stockpile the soil.

As the hole was being dug, the boundaries had to be defined. Six-foot squares were dug to a seven-foot depth; soil samples were taken just below the surface, at about the midway depth and a third sample was taken just above the water table.

The soil samples were measured with an organic vapor analyzer (OVA) and those reading between 10 and 500 ppm represent contaminated soil. Our samples almost always read above 500 ppm.

OVA readings above 500 ppm represent excessively contaminated soil and usually both soils have to be remediated in some way.

By the time the four boundaries were determined, three days had passed, two backhoes were being used simultaneously, four large piles of contaminated fill sat covered up within my maintenance complex, and a hole approximately 60 feet by 50 feet by 7 feet deep existed in the parking lot.

The situation was extremely stressful, and anxious thoughts about very costly cleanups filled my mind.

I began to call other superintendents whom I knew had gone through this for advice and support. I read all of the ma-

terial that I could find pertaining to fuel spills. The contractor, Drew Bently of Brevard Oil, was very helpful in guiding me through the first process and educating me about soil remediation.

Ultimately Bently's knowledge and guidance saved me \$30,000.

The tanks were removed and inspected by Drew and by me and no holes were found in the tanks. The main pollutant was found to be gasoline.

One theory of how the soil became so polluted is that the piping may have leaked over the years.

Another idea is that the large trucks that used to fill the tanks by the gravity method would often overfill the tanks and cause large amounts of fuel to spill onto the ground. This practice caused the state to adopt overfill guidelines that now require overfill protection devices on all tanks. Years of overfill may have accumulated in the soil to cause this situation.

Once the tanks were removed, the next step was to develop a plan to deal with the soil, which sat in four huge piles at our complex. Large sheets of plastic covered the soil to protect it from the rain.

Since I had a large amount of undeveloped, uninhabited and unused land available, "landfarming" of the contaminated soil was a real possibility. Drew encouraged me to pursue the landfarming method because of the great savings versus incinerating the soil in Kissimmee and paying the trucking fees.

At this point I was tired of looking at the stinking soil but I knew that landfarming the soil as for me. We began to develop a plan to deal with the 800 tons of contaminated fill.



*This pit, which once housed underground storage tanks, became known as "the swimming pool" during the decontamination process.*

I still had a huge hole in my shop complex that was a constant liability. Every night before we went home, we parked all of large equipment around the hole and wrapped the site in yellow warning tape in case someone were to get within our fenced shop area.

The time frame between the initial discovery and the time that we landfarmed the soil and filled in the hole was over two months. In that time the plastic used to cover the contaminated soil had to be replaced once because the weather had destroyed it.

Analysis of the groundwater revealed that it also was highly contaminated. Of course this was bad news because now not only did the soil need treatment, so did the groundwater.

During the two months that the hole

was open, the hot Florida sun and rains helped to clean the site. The groundwater contamination numbers reduced significantly during this time and algae, insects and weeds began to live in the bottom of the hole.

Finally we received authorization to go ahead with the plan to landfarm the contaminated soil.

I contacted a local fill contractor, Ed Hall, to arrange the transport of the polluted soil to the landfarm site and the hauling in of soil to fill our hole — or "swimming pool" as it was called by us and some of my friends.

The "swimming pool" was filled in first, and because the soil for filling was located close to the shop, the hole was filled in quickly.

The landfarm site was cleared by my

staff and the landfarm was prepared by Brevard Oil and my staff. Construction of the landfarm was done by clearing the site and grading it smooth.

We chose a flat site in the middle of one of our parcels about an acre to an acre in a half in size. Once cleared, 10 mil plastic "visqueen" was used to line the bottom. The soil was hauled in and spread out to a depth of about four to six inches.

Fumes could be seen rising into the air as the soil was spread.

After a day of trucking and working the soil, the landfarm was complete. The sides of the farm had to be bermed up and covered to prevent any rain water from leaving the site during storms.

The farm was turned five to six times a week with a disc to help the soil release



*Contaminated groundwater requires special equipment like this stripping tower to remove residual material.*

**The landfarm was plowed five or six days per week for many months. The financial savings made the work worthwhile and I would recommend the technique to anyone who has the acreage, the labor pool and the time. As I said earlier, landfarming saved us at least \$30,000 over the cost of trucking the soil to an incinerator.**

the gas. The hot sun also helped to deplete the gas from the soil.

The first couple of months saw a large decline in the OVA readings in the soil tests, but after the readings got very low, the decline seemed to flatten out and it took more time to degrade the gas.

For instance, the initial readings when the soil was removed from the ground were 500 ppm to over 1000. After about six weeks, the readings were generally below 200 ppm — a large decline.

However, it then took more than six weeks to get the readings below 60 ppm and then below 10 ppm, the final target.

After months of testing and plowing, contaminated soil does clean up. Samples have to be taken for a series of expensive

tests to prove that the soil is clean so it can be taken out of the landfarm if you so desire.

The soil remediation was very labor intensive. The landfarm set-up, hauling, spreading of the soil, and the plowing

took many man-hours.

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After all the time and effort that we devoted to the landfarm and soil remediation, we were still only three quarters of the way home.

### **Now for the groundwater**

We had removed the tanks, excavated the soil, remediated the soil and now we had to deal with the groundwater.

When the tanks and the soil were removed, a water sample was taken from the bottom of the hole and tested. The results indicated that more testing and possible remediation were necessary.

While the hole was open, we ran a stripper for a week and that helped to cleanse the water. The fact that the hole was open for two months also helped to clean the water as the air, sun and naturally-occurring microbes attacked the contamination.

In order to comply with the law, we were required to file a Contamination Assessment Report, or CAR, to the Florida Department of Environmental Regulation. The CAR explains that we did have contaminated soil and that we are correcting the problem.

The CAR mainly deals with the contaminated groundwater and is another expensive report, usually costing between \$11,000 and \$20,000 depending on the extent of the contamination and the number of wells and tests needed.

In order to complete the CAR, you must show how the groundwater is flow-

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*Contaminated soil must be stored on site until lab results determine the best disposal method. Extremely contaminated soil must be hauled to an approved burn center — a very expensive proposition.*

ing underground so that you can establish a perimeter for the plume of contaminated water.

At this point American Environmental Group entered and began doing the work. The groundwater flow direction was established and test wells were installed to test the water on the perimeter of the plume.

Test wells were installed in the area where the tanks had been, and a deep well was also installed to see if the contamination had moved down through the water. The other wells were drilled mainly downstream to see how far the plume had moved.

The test wells were well placed because once the perimeter was established, only one additional well was needed to

prove its boundary. With the tests all complete and the plume defined, the CAR can be submitted.

Our water tests came back with an 81 percent reduction in contamination since the first test. If the contamination continues to decline at that rate, we may be able to avoid remediation entirely.

This has been an experience that I will not forget and it is one that I hope that I will not have to repeat.

The tremendous size of the spill and the excessive costs for the cleanup, report filing and testing can ruin a budget and, if large enough, a business.

What have I learned from all of this?

- First, if you have underground tanks, get insurance.

- My experience has been that the DER is not out to make your life miserable as

long as you comply with the rules and meet the deadlines. Good communication is the key.

- Get a good, reputable, tank-removal company... one that does this type of work every day. Drew Bentley had the experience to guide me through soil remediation, thus saving us money.

- Finally, take it one day at a time. I wanted the whole thing cleaned up and out of sight overnight. Things like this take time: Tests take time, DER approvals and/or decisions take time. Remediation takes a long time.

Once the contaminated soil is removed, then time is your friend.

I hope that no one else has to go through this, but I'm sure that others will. I wish you lots of luck and patience.