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L.U.S.T. LINE

A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

A Hazardous Waste, *Or What?*

EPA's New Toxicity Characteristics Rule Throws a Monkey Wrench Into An Already Wrenching Petroleum-Contaminated Soil Disposal Predicament

NOT THAT A MONKEY WRENCH NEEDS TO BE A SOURCE OF FRUSTRATION. As Buckminster Fuller once said,"A problem adequately stated is a problem well on its way to being solved." After EPA studies the issue of whether or not UST petroleum-contaminated soils should be subject to regulation under the Resource Conservation and Recovery Act's (RCRA's) Subtitle C, the problem should be sufficiently and adequately stated and, theoretically, on its way to being solved...to some extent.

Part of the problem all along has been, and continues to be, the disposal of petroleum-contaminated media (soil, groundwater, surface water, recovered product) and debris generated during UST corrective actions. States have been struggling with this issue for a number of years, especially since many landfills across the country have either closed, refused to accept the soils, hiked the dumping fees, and/or put tighter restrictions on what soils they will accept.

As a result, states have been in a "finding alternatives to landfilling" mode which is, in fact, the sensible thing to do. After all, landfilling soils as a waste essentially just transfers the problem from one place to another - an undertaking that is somewhat paradoxical, if not perverse.

More and more states are looking toward using alternative soil treatment and disposal technologies that will make these contaminated soils less contaminated so that they can either be treated in place and not removed at all; removed, treated and returned to their original site; or treated and used for some other functional, but environmentally sound purpose. Some of the promising soil treatment/disposal options have kinks here and there that need a bit of improvement. But, all in all, a number of states are making real progress (see "Soil Treatment on the Big Penninsula" on page 8).

Then came the March 29 Federal Register in which EPA added a new - and more or less anticipated - dimension to the conundrum by introducing a rule that establishes a new toxicity characteristics (TC) test for determining whether a waste contains hazardous constituents. The current extraction procedure (EP) leach test will be replaced with a

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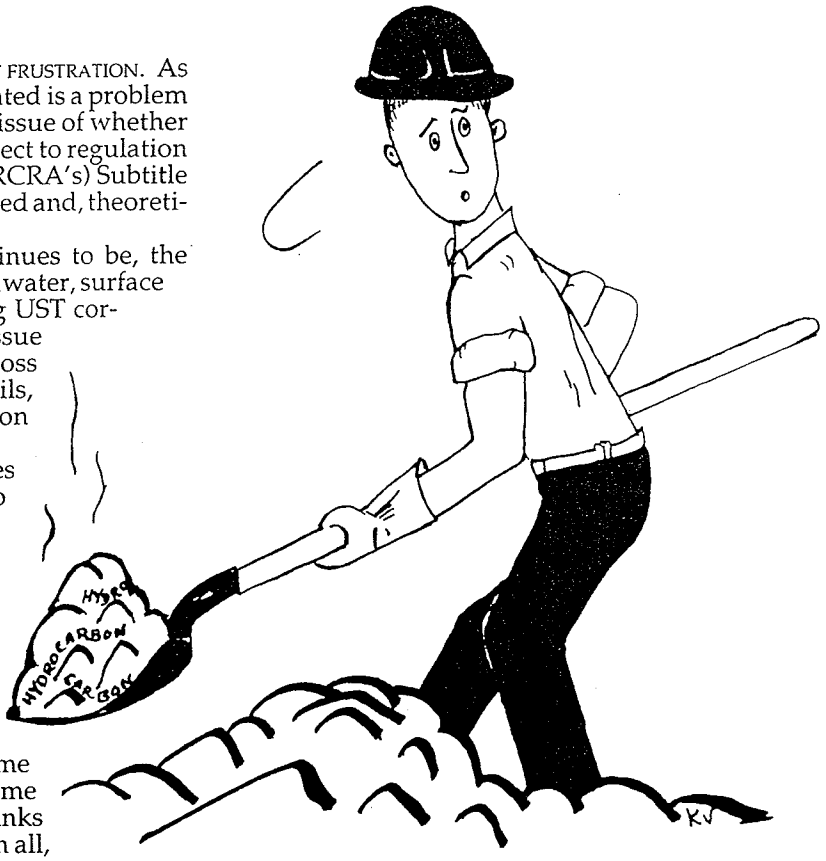

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new Toxicity Characteristics Leaching Procedure (TCLP).

The rule also adds 25 organic chemicals, including benzene, to the list of toxic constituents that will have to be treated as "hazardous wastes" and regulated under Subtitle C of RCRA. This potentially brings many of the previously "non-hazardous" wastes containing hazardous substances, currently covered under RCRA's Subtitle I UST program, into the Subtitle C system.

The regulatory levels for the TC test tend to be quite low. For example, a waste is considered hazardous if it has 0.5 milligrams per liter (0.5 ppm) or more of benzene. In the preamble to its rule, EPA admitted that contaminated soil and groundwater at many UST sites would probably exhibit the toxicity characteristic. This material would then be subject to RCRA's "cradle to grave" hazardous waste tracking system.

Don't Panic!

However, EPA has opted to defer petroleum-contaminated media and debris regulated under Subtitle I UST corrective action requirements from regulation under Subtitle C - pending further study. The Agency felt that subjecting the hundreds of thousands of UST release sites expected to be uncovered in the next few years to Subtitle C requirements could "overwhelm the hazardous waste permitting program and the capacity of existing hazardous waste treatment, storage, and disposal facilities." Furthermore, it would likely discourage and delay cleanups.

This deferral does not include tank bottom material associated with tank cleaning and removal, nor does it apply to non-regulated USTs, such as heating oil tanks and product that has leaked into the soil from aboveground tanks. Generators of these waste materials bear the responsibility for determining whether they have a hazardous waste and, if so, managing it properly. Free product recovery would not be subject to Subtitle C requirements as long as it is recycled, because the material being recovered is not considered a hazardous waste, in this instance. The effective date of this rule is September 25, 1990.

...states may well be on the cutting edge of new and better ways to handle petroleum contaminated soils with new soil treatment technologies

Pending Further Study

The preamble discussion supporting the temporary deferral contains a commitment to study the issue further. Specifically, the EPA Office of Underground Storage Tanks (OUST) will examine:

- Characteristics of UST corrective action sites, including the amount and types of media that would fail the TC test;
- Current practices for management of media and debris;
- The impact of Subtitle C requirements for USTs on federal and state hazardous waste programs;
- Evaluating hazardous waste treatment, storage, and disposal capacity for UST media and debris; and
- Whether and how Subtitle C requirements can be applied to UST cleanups.

At the conclusion of these study efforts, "...EPA will determine whether to retain the temporary exemption for UST cleanups...or to remove the exemption and make the TC fully applicable."

Lest We Rule Out More Fitting Solutions

Most state UST regulators readily concur that removing the exemption and making the TC fully applicable would create a full scale UST cleanup quagmire. "We're already trying to handle the soils responsibly," explains Michael Anderson, UST Cleanup Hydrologist with the Oregon Environmental Quality Commission. "We have enough of a problem trying to deal with the contaminated soil, as it is. If we had to treat it as a hazardous waste, I don't know how we would handle it."

The Oregon Environmental Quality Commission (EQC) recently addressed contaminated soils by setting a fairly straightforward risk assessment based on a number of site specific factors. They adopted *Cleanup Rules for Leaking Petroleum UST Systems* that outline basic cleanup approaches for petroleum LUST sites, regardless of site complexity. To deal with simple cleanups, where the only problem is soil contaminated with motor fuel or heating oil, the EQC adopted *Numeric Soil Cleanup Levels for Motor Fuel and Heating Oil*, which they refer to as "The Matrix."

"When I heard the TCLP ruling was being developed, we had just recently adopted our soil matrix," recalls Anderson. "The first thing I thought was, how would that affect us? What if the cleanup levels we just adopted would fail TCLP?"

John Ruddell, Chief of the Florida Department of Environmental Regulation's Bureau of Waste cleanup says the possibility that UST petroleum contaminated soils could eventually be considered "hazardous wastes" under RCRA Subtitles C would totally preclude the majority of the treatment options currently allowed in his State. Furthermore, more than 9000 UST sites would become hazardous waste sites; greatly increasing cleanup costs and permitting time. "Our approach to soil treatment in Florida is continuously improving. We are generally doing a better job as we learn more."

"We have been working toward responsibly handling these soils, carefully permitting a variety of treatment options, including bioremediation and low temperature thermal incineration," says Frank Peduto, Senior Engineer with the New York State Department of Environmental Conservation Bureau of Spill Prevention and Response. "Now, potentially, by having this media declared a hazardous waste, we could see this technology inhibited. Vendors would have to get hazardous waste treatment permits, which would put them through more hoops and and drive up treatment costs.

"We respect the fact that the TC ruling is directed toward better management of this material, however, we feel our agency already properly and effectively manages this waste.

LUSTLine

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The New England Interstate Water Pollution Control Commission was established by an Act of Congress in 1947 and remains the oldest agency in the Northeast United States concerned with coordination of the multimedia environmental activities of the States of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

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Layout, *Ricki Pappo*

Because we pretty much ride herd on all this material and treat to environmentally responsible cleanup levels, we feel we are accomplishing the goals of the TC rule. In our opinion, there would be no environmental benefit in treating this material as a hazardous waste."

"Furthermore," Peduto points out, "EPA has not evaluated the impact of the TC rule on petroleum contaminated soils not generated under the UST program, such as petroleum from aboveground tanks and surface leaks and spills. We have begun to employ a variety of in-situ and aboveground soil treatment technologies that can treat the benzenes - no matter what the source."

The bottom line is, states may well be on the cutting edge of new and better ways to handle petroleum contaminated soils. Many of these new soil treatment technologies may work more effectively in terms of environmental protection and destroying the contaminants of concern than the inveterate routine of trotting untreated, manifested soils off to an ever shrinking supply of permitted hazardous waste disposal sites.

The progress that has been made could be for naught should EPA conclude, after study, that the TC rule is to be fully applicable to corrective action under Subtitle I. This is why many UST regulators would like to see the classification of petroleum contaminated soil resolved with some kind of "special waste" designation - to allow for creative ways of handling soil.■

For more information on the TC Rule,

contact: the RCRA/Superfund Hotline at (800)424-9346 or (202)382-3000 in the Washington, DC area. For information on specific aspects of the rule, contact Steve Cochran, Office of Solid Waste, US EPA at (202)475-8551. For information about the UST deferral, contact John Heffelfinger, EPA Office of Underground Storage Tanks, at (202)382-2199. EPA requests data and comments from the public on this issue.

Soil Treatment Mix 'n Match

A variety of soil treatment/disposal options have surfaced over the past few years, which has made it possible for states to make choices based on appropriateness for the site and situation.

- IN-SITU TREATMENT is expensive for small amounts of contamination. It is best for sites with more contaminated soils than can feasibly be removed. The goal in using in-situ technologies is to destroy the ability of contaminated soil to create a plume of dissolved groundwater.

Within the in-situ category, ***soil vacuum extraction*** is being used successfully more and more. The technology extracts organic vapors from the soil using a vacuum. It works well with volatile soluble organic constituents, but not for less volatile heavier fuel oils. The EPA OUST is preparing a training package on soil extraction which will include, among other things, a video on subsurface transport and identifying ways state regulators can review vacuum extraction proposals.

The impeding factor to soil venting is stricter air quality standards. OUST is working with a few EPA labs to help expedite permitting of commercial systems which are capable of treating vapors to state standards.

Bioremediation is another promising in-situ technology which involves enhancing the environment so that indigenous microorganisms can get busy degrading the hydrocarbons in the soil. It works best after any free product has been removed. Too much product is too toxic for the bugs. Bioremediation works best where the groundwater is not immediately threatened.

- ABOVE-GROUND SOIL TREATMENT TECHNOLOGIES are gaining momentum. Soils can be incinerated in a variety of ways to destroy or reduce levels of volatile organics in the soil. Incinerated soils are used as cover material in landfills or they are sometimes incorporated into other products, such as roadbed material, concrete or asphalt. Asphalt batching plants are being used more and more for this purpose. Mobile incinerators are gaining acceptance as a means of treating volatiles on-site without removing the soil from the site.

Land spreading, land farming, above-ground bioremediation, or on-site aeration are all techniques that involve allowing volatilization and natural biodegradation of the organic contaminants in the soil It requires an adequate and permissible land area, but can work well to get volatiles to manageable levels. Air quality concerns are the biggest issue associated with both incineration and land spreading.

EPA Reports to Congress on Exempt Tank Study

When EPA's underground storage tank (UST) regulations were issued in 1988, some types of UST systems had been exempted by Congress from these regulations. Two significant exempted UST systems were those storing heating oil used on the premises where it is stored, and farm or residential tank systems of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes. While Congress exempted these tanks under Subtitle I of the Resource Conservation and Recovery Act (RCRA), it directed EPA to study the heating oil and small capacity motor fuel USTs to determine if they should be regulated.

EPA recently completed this study, concluding that problems associated with these exempt tanks will not be solved through the implementation of uniform Federal regulation of these systems...at least at this time. The Agency made the following three recommendations to Congress:

- Establish a Congressional ban on the installation of new unprotected underground heating oil and motor fuel tank systems to address the major technical problem leading to tank failure;
- Continue the current exemption for these tanks, because their unique characteristics make the implementation of Federal regulations inappropriate; and
- Authorize EPA to establish educational and technical assistance programs to disseminate information to owners of exempt tank systems on proper tank management and to provide technical assistance to state and local governments to develop their regulatory programs, as needed.

If these recommendations are accepted and established, the Agency will monitor their effectiveness and evaluate the necessity for undertaking further action.

The Rationale

EPA concluded that the problems associated with exempt tank systems need to be handled differently than those associated with USTs currently regulated under Subtitle I for several reasons. Some primary reasons are:

- A majority of the exempt tank systems are owned and operated by homeowners who have limited technical expertise and financial resources

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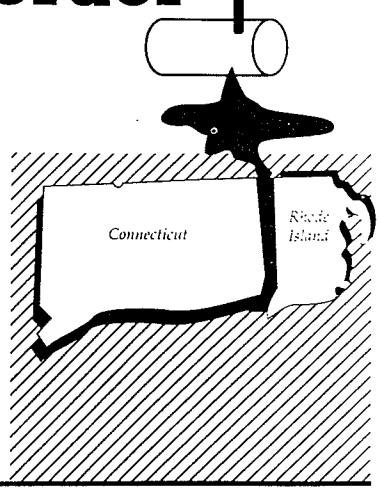
Heading Off LUST at the Border

Pawcatuck, Connecticut UST Release Threatens Westerly, Rhode Island Well Field



WHEN THE ATTENDANT at the small Pawcatuck, Connecticut gas station stuck the tank on that cold rainy February 15th afternoon, it was clear something was wrong. The 2,000 gasoline tank had just been filled, and now only four inches were left draining from the bottom. Although daily inventory readings had been somewhat abnormal during the preceeding few months, the abnormalities appeared to be explicable, based on the records they'd been keeping. But this discrepancy... this couldn't be accounted for as errors in product delivered or dispensed or anything. This was a sudden and full-fledged loss of containment. The Connecticut Department of Environmental Protection (DEP) UST Enforcement and Oil and Chemical Spills Emergency Response offices were immediately notified.

The discovery of this gasoline leak triggered a good deal of commotion in both Connecticut and Rhode Island. Besides emergency response and enforcement personnel, the incident brought out both governors, the press, local officials, local roadside observers - the whole shootin' match. It also brought out laudable interstate and responsible party cooperation.

At issue, apart from the obvious environmental and safety concerns, were the municipal water supplies down gradient of the tank. The gas station, located at the Rhode Island/Connecticut border along one of the main Connecticut thoroughfares to Rhode Island beaches, is a few hundred yards from the Pawcatuck River in an area surrounded by wetlands and underlaid with porous sand and gravel soils.

A Connecticut DEP Spill Response person arrived at the facility and immediately issued an order for the tanks to be pumped and removed. He notified the Town of North Stonington, Connecticut and the heavily populated Town of Westerly, Rhode Island that the spill had occurred and that their water supply well fields appeared to be directly in the path of product migration.

When Town officials in Westerly, Rhode Island heard about the leak, they went to see if they could smell anything in any of the water suply wells. They smelled something. "The Town reported the smell of a gasoline odor in observation wells used to measure water drawdown, located along side the drinking water production wells," explained Bruce Catterall, Engineer in Charge of Site Remediation for the Rhode Island Department of Environmental Management (DEM). "We responded with urgency, because we were concerned that Westerly's wells had already been impacted.

"The pumps were shut off. The Town implemented water restrictions and maximized other supply sources. Westerly doesn't have a lot of extra water, but we felt until we knew more, it would be best not to influence groundwater flow in close proximity to the spill, at all. Even once we knew the wells were not impacted, we felt that under pumping conditions, the river would not serve as a barrier to the pollution," said Catterall.

Four Tired Old Tanks

Meanwhile, back at the gas station, the facility owner, Hendel, Inc. of Waterford, Connecticut, had the 2,000 gallon tank pulled. A hole about the size of a nickel was found directly under the fill pipe (an area of the tank prone to internal corrosion because of repeated use of the dip stick and turbulence from filling the tank). Over the next couple of days a 6,000 gallon tank and a 10,000 gallon tank were also removed from the same facility.

According to Scott Deshefy, Connecticut DEP UST Enforcement Program Coordinator, the 10,000 gallon tank also had a hole about the size of a nickel under the fill pipe, but the product seems to have been somewhat contained by a "rust plug" that had covered the hole until the tank was removed. Later on a 1,000 gallon waste oil tank was removed and found to be leaking. This tank had a number of smaller perforations.

Inventory records revealed that about 1,500 gallons of gasoline had been released into the ground catastrophically from the 2,000 gallon tank, although that tank and the 10,000 gallon tank had probably leaked some amount of gasoline prior to this incident. The 10,000, 6,000, and 1,000 gallon tanks were installed in the 1960's and were subject to Connecticut's September 1, 1989 deadline for removal. Since the tanks were still in service as of February 15th, they were in direct violation of the State's UST regulations. The date the 2,000 gallon tank was installed is still in question.

The Responsible Party

Once the leak occurred, the owner/operator signed a consent order to fully investigate the extent of contamination and take steps to abate the problem. According to Elsie Patton, Program Manager for the Connecticut Groundwater Contamination Program, Hendel installed a total of 46 observation wells and conducted a wide range of aquifer and water quality testing measurements.

One week after the release was discovered, the Connecticut Attorney General's office issued a statement that the State is suing the gas station owner/operator, Hendel, Inc. The Attorney General's office reported a maximum penalty as high as $15 million might be sought, based on the penalty of $25,000 per day, per tank for each violation. Hendel owns a number of UST facilities in the eastern Connecticut/Rhode Island area.

"I think a lot of things broke right," observed Bruce Catterall. "I think Connecticut had a responsible party who was big enough to get on with clean up, but not so big that the company had layers of bureacracy to get through. With some of the bigger oil companies, you get bogged down with so many levels of bureacracy that everything slows up. Hendel had drill rigs on-site since the first day. Within two weeks they had about 20 shallow and deep monitoring wells installed."

Quick Action in the Field

Federal LUST Trust money can be used for emergency situations like this, when a cleanup must be rendered efficiently and rapidly. "We've had a

number of sites here in Connecticut where the LUST Trust has been invaluable," said Scott Deshefy. "It enables us to move right in and get things going."

In the case of Pawcatuck, the responsible party assumed much of the costs for corrective action. The Connecticut LUST Trust program covered such things as State personnel costs and sample analysis. LUST Trust equipment was used to install monitoring wells, get the first recovery well in place, make a determination as to it's efficiency, and initiate pumping to reduce the rate of gasoline migration.

The DEP LUST Trust staff have been cultivating their field measurements capabilities, and Pawcatuck presented the perfect opportunity to put this know-how to use. Connecticut LUST Trust staff joined the US EPA Region I and Rhode Island DEM staff at the Westerly well field site to try to determine as quickly as possible whether the water supply wells had, indeed, been affected.

"We took samples from monitoring wells around the pumping wells, which had been shut off," Peter Zack, Connecticut DEP LUST Trust Coordinator, explained. "We analysed the samples on the spot, using a portable gas chromatograph purchased with LUST Trust money. We didn't detect any gasoline in the water. We submitted split samples to a lab. As it turned out, our numbers were very close to the lab results." The odor in the monitoring wells was traced to a grease used to coat the threads on the sections of pipe when the wells were installed.

The portable GC was used to help get the recovery well system on line quickly and to analyse the samples generated from the well. "When installing a recovery well, you need to know how much gasoline contamination is in the water," said Peter Zack. "We were able to give them this information on the spot, instead of waiting for lab results.

"Also, you can't begin to discharge from the recovery well until you have determined that the air stripping tower is doing its job of treating the contamination. Again, you usually have to send a sample to the lab and wait at least a couple of days. With the GC, we were able to tell them, 'okay, you're a little high.' They'd tweak some knobs. We would take another sample, and in a short time they had the okay to start discharging. They were able to start treating almost immediately. The GC can be a very powerful tool."

"We also used the GC to sample the groundwater monitoring wells as they were being drilled," explained Peter Zack. "The engineers and hydrologists had information right on-site. After each well was put in and purged we were able to get a sample and tell them how much contamination was in it. They could use this information to help decide where the next well should go. We were asked to go back several times during remediation, because our information allowed them to make decisions in the field instead of waiting for lab results. Correlation with lab results has been very good for all of the sites we have tested."

Since pollution does not recognize political boundaries, a regional and interstate approach to groundwater protection and pollution prevention is ultimately the most effective solution.

As emergency response activities wound down, DEP Water Compliance staff continued to determine where additional monitoring wells should be placed. They are now involved with long term site remediation and monitoring of the contamination plume, which had gotten almost to the edge of the river, within 150 yards of the Westerly water supply.

"We are in the process of evaluating what will happen if Westerly turns the pumps for this well field back on," said Elsie Patton. "We ran the hydraulic control pump test on 2 of the 3 well fields that were shut down. They are now back in service, safe to drink, and being monitored. When we ran the test on the third pump closest to the spill we determined that, under recovery conditions at that time, the well field was still at risk of contamination. Consequently, remediation efforts continue. Another recovery well and two more observation wells were added. There are now 5 recovery wells discharging into the Pawcatuck River."

Take Not Thy Water Supply for Granted!

Within one month, the small State of Rhode Island had two emergency situations involving LUSTs and public water supplies. Both communities had to take a hard look at the vulnerability of their water supply wells. Bruce Catterall noted that the Pawcatuck emergency caused everyone involved to give thought to the long term and interim measures that might have to be employed in this situation.

"The Town of Westerly's response was to recognize that even if this particular threat wouldn't become a reality in terms of actually polluting that well, they shouldn't put all their eggs in that one basket. Now they're exploring other well sites and developing contingency plans," Catterall said.

Throughout the country, many community water supplies lie in close proximity to potential sources of pollution. Unfortunately, many communities only begin to deal with this threat when the crisis has already arisen. Since pollution does not recognize political boundaries, a regional and interstate approach to groundwater protection and pollution prevention is ultimately the most effective solution.■

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Exempt Tank Study

to comply with Federal regulations.

- There are fewer established channels, such as routine inspections by fire marshals, for ensuring compliance by exempt tank owners. Creating such channels would require enormous expenditures.
- Developing uniform Federal regulations for the entire nation may not be warranted, because the types of exempt tank systems - and associated problems - vary throughout the United States. For example, small residential heating oil tank systems are concentrated in the Northeast; farm motor fuel tanks are more concentrated in the North Central and West.
- States and many local governments have established UST regulatory programs that did not exist at the time Subtitle I was developed. These programs provide states the opportunity to target additional resources to address exempt tanks wherever needed, instead of relying on uniform Federal regulations. Many of these programs have already begun to regulate exempt tank systems.■

For more information about this Report to Congress, contact the RCRA Hotline at 1-800/424-9346. In Washington, D.C. call 202/382-3000. For a copy of the Executive Summary of this report, write to: U.S.EPA, Office of Underground Storage Tanks, P.O. Box 6044, Rockville, MD 20850.

Tank-nically Speaking

by Marcel Moreau

This column will be a regular feature of LUSTLine. We are using it as a forum for addressing the technical questions and interests of our readers...by way of the opinions of Marcel Moreau, a nationally recognized petroleum storage specialist. We invite you to send us your technical questions and opinions.

Tightness Testing - Let's Begin With Nomenclature

We get a lot of consumer-type questions about tank testing. We hear horror stories of tight tanks being dug up, leaking tanks left in the ground, and different test methods producing a variety of test results for the same storage system. In order to even begin to talk about tank testing, we had best begin by defining and discussing some terms.

There are about a dozen tank testing terms in use today, which are often used interchangeably, even though they may mean many different things. Here is my list of terms and associated definitions. They are listed in approximate chronological order to show the evolution of methodologies for determining if a UST is leaking.

• ***Tank Test*** - This is probably the most commonly used term, and also the most inclusive. A tank test is an intensive monitoring procedure conducted over a period of a few hours when the storage system is not operational. Although it can be used as part of a leak detection monitoring method, it is distinct from most other leak detection methods in that it is generally performed by specialized personnel using equipment brought to the site to conduct the test. With a few exceptions, this is probably a good working definition for a term which encompasses so many different methodologies. By itself, this term implies nothing about a specific test procedure.

• ***Pressure Test*** - Probably the earliest form of tank tightness test, a pressure test involved plugging all the storage system openings and pumping air into the tank until a pressure of 5 pounds per square inch was reached. A pressure gauge was attached and monitored for a period of an hour or so. If the pressure remained reasonably constant, the tank passed the test. There was no standard procedure for how much product was to be left in the tank. The test was only able to detect very large leaks, because the the compressibility of air made it necessary for a very large amount of air to be lost before the pressure in the tank would be measurably affected.

In addition, the procedure was dangerous when used with highly volatile products such as gasoline, because the addition of air into the tank could produce an explosive ratio of gasoline vapor to oxygen. The rapid introduction of air through an ungrounded rubber hose could produce a spark that could ignite this mixture. It was a fatal accident involving an air pressure test that prompted the development of today's volumetric tank tests.

• ***Standpipe Test*** - This test involved filling the storage system into the fillpipe and then monitoring the level of liquid in the pipe for an hour or so. Sometimes a length of pipe was added to the fill pipe to bring the liquid level above grade to facilitate measurement and include all of the piping in the measurement, as well. A one inch drop of level in the standpipe was a commonly accepted standard for failure.

Although the test was safer than the pressure test, it's accuracy left much to be desired. There was no compensation for temperature, and no time allowed after filling the tank for deformation to occur. I suspect that many tanks failed this test simply because of tank deformation effects. The .05 gallon per hour standard for leak detection probably originated with this test. A one inch drop in a four inch diameter standpipe calculates out to be a volume change of .05 gallons.

• ***Final Test*** - The National Fire Protection Association (NFPA) has for many years published the document *Underground Leakage of Flammable and Combustible Liquids*, commonly known as "NFPA 329." This document is intended for use by fire officials or other regulatory authorities who may need to determine the origin of explosive vapors in buildings or sewers. As part of the investigation, the document describes some preliminary procedures for investigating USTs, such as checking inventory records and inspecting the visible portions of the facility. In the earlier versions of NFPA 329, if these methods did not reveal any evidence of leakage, then a "final test" was to be performed.

The test was basically a standpipe test, with the additional requirement that the test compensate for variables such as temperature changes in the product and the deflection of the ends of the tank when the tank was overfilled with liquid. The liquid level was to be above grade so that all of the below grade components of the system could be tested. Although labelled "final test," the requirements actually paralleled a recently developed test known as the Kent-Moore test.

• ***Kent-Moore Test*** - Although the safety of the standpipe test was recognized, it was also known to be very unreliable. Working with the American Petroleum Institute (API), Fred McClean, a retired Mobil Oil Company engineer, investigated the reasons for this unreliability and identified two factors. One was that the changing temperature of the product dramatically affected its volume, so temperature effects had to be taken into consideration to improve the accuracy and reliability of the standpipe test. This was accomplished by measuring the temperature of the liquid with a sensitive thermistor and circulating the product in the tank to obtain a uniform temperature distribution.

The second factor was tank end deflection, which resulted in an apparent loss of volume in the tank, because of the increase in hydrostatic pressure from overfilling the tank. This was compensated for by first raising and then lowering the level of the liquid in the standpipe. It was thought that the tank deformation would stabilize after the pressure was reduced.

The test got it's name from the Kent-Moore Company, a tool making firm, which developed the equipment and held the patent rights. The test equipment became commercially available in 1965.

• ***Petro-Tite Test*** - In 1980, the patent rights to the Kent-Moore test were purchased by the Heath Company, and

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Tank-nically Speaking, *continued*

the test method was renamed the Petro-Tite test. Petro-Tite is sometimes used generically to refer to any tank test, in the same way that Xerox has come to mean photocopy.

• ***Precision Test*** - In the 1984 version of NFPA 329, the "final test" was renamed the "precision test" to identify it as the most precise method of UST leak detection then known.

• ***Hydrostatic Tank Test*** - This term is sometimes used as a generic term for a volumetric tank test. It refers to the fact that the test is conducted using liquid pressure rather than air pressure.

• ***Volumetric Tank Test*** - This test is is conducted by monitoring the volume of the liquid in the system, while compensating for for any variables that may affect the volume. The results of the test are usually given in terms of a measured loss or gain of liquid per hour.

• ***Overfilled Tank Test*** - This is a volumetric test which meets the original NFPA 329 requirement that all of the below grade piping be filled with liquid during the test.

• ***Underfilled Tank Test*** - This is a volumetric test conducted with the liquid level in the system significantly below the tank top. The development of this test resulted from the recognition that overfilling the tank during the test introduces the problem of vapor pockets and exacerbates the problem of tank deformation. This type of test has been encouraged by the EPA definition of tightness test, whereby only those portions of the storage system that routinely contain product need to be tested for leakage.

• ***Piping Tightness Test*** - This is a tightness test specifically designed for piping. In UST systems it is generally applied to the product supply piping, which carries product from the tank to the dispenser. Inasmuch as piping can withstand much higher pressures than tanks and the volume within a typical piping network is relatively small, pressure testing of piping is still the standard method.

NFPA 329 specifies that piping must be tested by being pressurized hydrostatically at 150% of the operating pressure, but not less than 5 psi, maintaining the pressure for at least 10 minutes. The federal regulations have added performance requirements to piping tightness testing of a minimum detectable leak rate of .1 gallon per hour and a probability of detection of 95% and false alarm of 5%.

• ***Non-Volumetric Tank Test*** - The problems associated with volumetric tightness testing have encouraged the development of non-volumetric tests. These tests use techniques that do not involve measurement by volume of liquid in the tank and are thereby unaffected by many of the problems associated with volumetric tests. These tests typically give results in terms of pass or fail based on the detection of a specific leak criteria, such as the presence of a trace gas or an acoustical signal.

• ***Tightness Test*** - This is a generic term for a UST testing methodology which can meet EPA performance standards. The test must evaluate any portion of the tank that routinely contains product, and must compensate for thermal expansion or contraction of the liquid, vapor pockets, tank deformation, evaporation or condensation and the location of the water table.

The definition includes a performance standard of the detection of a leak of .1 gallon per hour with a detection probability of 95% and a false alarm probability of 5%. This means that in a population of 100 tanks, each of which has a .1 gallon per hour leak, the method will find the leak in a least 95 of those tanks. Conversely, in a population of 100 tanks, each with a leak rate of zero gallon per hour, less than 5 of the tanks will fail the test and incorrectly be called leakers.■

COLIS Thrives

IT'S NOT A DISEASE, IT'S THE COMPUTERIZED On-Line Information System (COLIS), which is busily providing users with readily accessible information and case histories on LUST cleanups. In the past four months users have been calling from all over the U.S. and even Europe. COLIS was designed to support some of the many UST needs - varying levels of experience, new technologies, increasing numbers of contaminated sites - by providing users with actual field documentation and the rationale behind field decisions at cleanup sites, all of which is now easily accessed on personal PCs with COLIS.

The folks who developed COLIS at EPA's Risk Reduction Engineering Lab Release Control Branch in Edison, New Jersey gratefully acknowledge all those state on-scene coordinators and task project managers who provided case history reports to make this technology transfer possible. COLIS is a user friendly system that can help response personnel deal with those nagging cleanup questions that continuously emerge during remediation of a contaminated site.

The files provide users with such site assessment data as: short term and long term corrective action cleanup technologies, relevant cost data, closure activities, recent UST publications, insight on the successes/failures of alternative cleanup approaches, and actual reference personnel who were responsible for making these decisions. This is not an "expert referral system," rather it is a means for transferring information on actual cleanups from those who have dealt with or are currently dealing with contaminated sites to those who have similar site problems of their own.

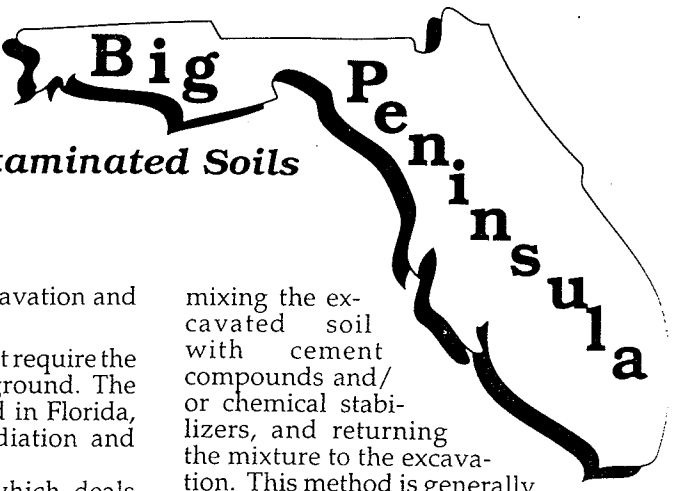
Is COLIS difficult to use? Not at all, it's easy to work with and requires little to no reading of guidance documents. (Documentation is available to those who want it.) The system is designed in such a fashion that one can go On-Line and simply punch away at the keyboard with immediate success. A system operator is available should you encounter any problems or you may leave a message on COLIS and someone will get back to you.

How can you access COLIS? First of all, COLIS is free public information; second, you can access the system with little knowledge about computers. You need a PC, a modem, and a communications software package - then, you're all set. Give the COLIS operators a call and they'll set you up immediately.

If you have a case study that deals with the cleanup of a contaminated site, please give the folks at COLIS a call. You're input helps others resolve some of the same problems and tasks you have encountered.■

For more information, contact the EPA COLIS Operator at 201/906-6871, *or*
Robert W. Hillger , U.S. EPA
2890 Woodbridge Ave.
Building 10, (MS-104)
Edison, NJ 08837
phone 201/321-6639.

Soil Treatment on the Big Peninsula



A Chronicle of Florida's Petroleum Contaminated Soils

by John Ruddell

The Florida State Underground Petroleum Environmental Response Action Act (SUPER Act) of 1986 provided funds to cleanup petroleum contaminated sites and granted a sort of "amnesty" to those who reported their sites before December 31, 1988. The amnesty took the form of a free cleanup, either by the State or through reimbursement to the owner or operator, for sites reported before the deadline. The result was 9,437 sites reported by the end of that deadline.

With this number of contaminated sites it is clear that a vast amount of soil must be cleaned up - and at costs that won't break the bank. In Florida, all of the regulations and procedures for soil cleanup are based on the premise that groundwater is the most critical resource in need of protection and restoration. This bias stems from the State's heavy reliance on groundwater as a drinking water resource (about 97% of the population relies on groundwater for drinking water), and the extremely shallow depth to groundwater throughout much of the State.

Contaminated soils are viewed as a continuing source of groundwater contamination, which must be addressed before any long term restoration of a site can be achieved. Without this kind of approach we could expect larger groundwater plumes to cleanup, prolonged groundwater treatment times, and increased cleanup costs.

Florida's soil cleanup guidelines state that:

- Soils with total hydrocarbon readings greater than 500 ppm on an organic vapor analysis instrument with a flame ionization detector are considered "excessively contaminated" and must be remediated - and may warrant immediate remediation.
- Soils with readings between 10 and 500 ppm are "contaminated" and may have to be remediated, depending on site conditions and actual levels.
- Soils with readings below 10 ppm are generally considered "clean" with little potential effect on groundwater.

Treatment Types - Plusses and Minuses

The treatment of contaminated soil falls into the two broad categories of in-situ treatment and excavation and treatment.

IN-SITU TREATMENT does not require the removal of soil from the ground. The two in-situ methods used in Florida, at present, are bioremediation and vacuum extraction.

- ***Bioremediation***, which deals with enhancing the bacteriological activity that naturally degrades hydrocarbons in soil, has proven to be difficult to control and has, so far, met with limited success in the State.
- ***Vacuum extraction***, which works on the volatile fraction of the contamination, is a promising technique that works well on some types of contamination and in specific geologic and hydrogeologic environments. It is not effective in high water table or tight soil situations. If not controlled, it has the potential to merely transfer the contamination to the air, rather than treat it.

EXCAVATION AND TREATMENT is a method where the soil is removed from the area of contamination and treated either on-site or transported to another location for treatment. Treatment methods used in Florida include: landfilling, landfarming, fixation, and incineration. All have their advantages and all have some drawbacks:

- *Landfilling* of non-saturated, non-hazardous soils in a lined land fill is permitted in Florida at present. The number of landfills that accept petroleum contaminated soils has been steadily declining due to liability concerns on the part of landfill operators. In addition, disposal costs have continued to increase.
- *Landfarming* is a treatment method that relies on a combination of volatilization, biodegradation, and photo-degradation. It can be done at the contamination site or at an approved off-site facility. The method requires an area large enough for the volume of soils to be spread 6 to 12 inches for the duration of the treatment period. It also requires runoff and infiltration controls.

Currently, there are no permanent off-site landfarming facilities in Florida, but several petroleum cleanups are doing on-site landfarming. The land area required limits this technique as an option for the typical service station scenario.

- **Soil fixation** usually consists of mixing the excavated soil with cement compounds and/or chemical stabilizers, and returning the mixture to the excavation. This method is generally not used at petroleum contamination sites in Florida, primarily due to the high costs involved.
- **Incineration** is the preferred treatment method for petroleum contaminated soils in Florida, because, when done properly, it results in the destruction of the contaminants. A number of asphalt plants, stationary industrial incinerators, and mobile incinerators have been permitted to do soil treatment. Regulations governing air discharges and materials handling are evolving as we gain information through experience. Guidelines on the use and disposal of incinerator-treated soils are being developed, based on the type of treatment system employed.

The Incineration Menu

Currently, there are four types of facilities with the potential for burning petroleum contaminated soil in the State: asphalt plants, cement/clay kilns, fixed facility commercial rotary kiln incinerators, and mobile incinerators. The first two types were designed and built for some other purpose other than burning contaminated soil; the other two are units specifically designed to deal with contaminated material. All but the rotary kiln incinerator are treating soil in Florida. Here is a brief description of each of the four incineration methods:

• Asphalt plants

A number of facilities whose primary business is producing asphalt are permitted to decontaminate soils containing petroleum products. The majority of these plants utilize dryers that operate at temperatures of around 350°F. With these relatively low temperatures, they are best used for soils contaminated with light petroleum products, such as gasoline.

As is the case with all thermal treatment units, decontamination is accomplished by a combination of volatilization and oxidation - volatilization plays the key role in this type of

facility. The natural volatilization of petroleum contaminants is enhanced in the thermal treatment process by raising the vapor pressures of the volatile constituents.

Many of the asphalt plants use the decontaminated soil as part of their asphalt mix. The ability of asphalt plants to treat soil to levels that are acceptable for other uses is increasingly coming into question. The State has established soil disposal/use guidelines. The following are the current guidelines which are being updated in new regulations due out this October:

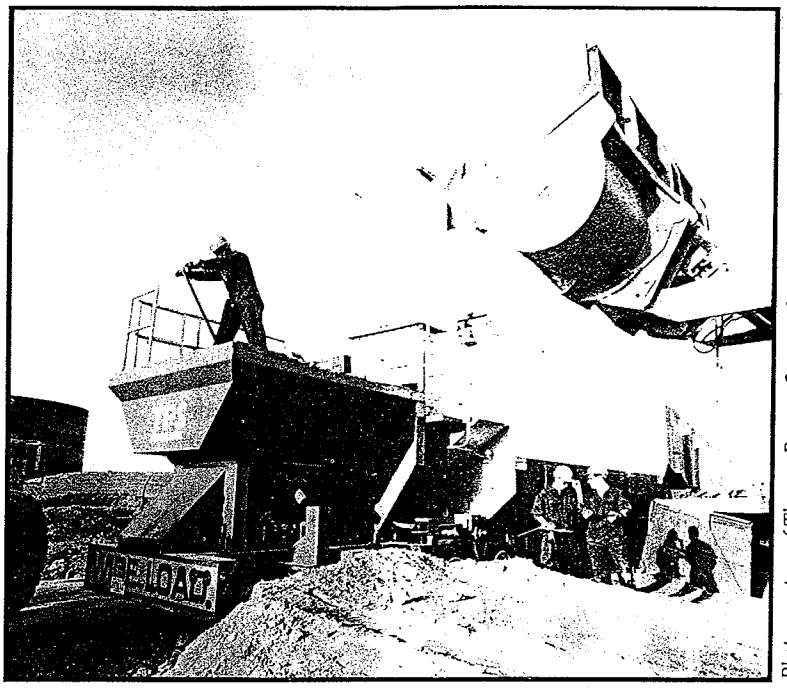


Photo courtesy of Thermo Process Systems Inc.

MOBILE INCINERATION UNIT

• *If the soil is to be used as part of an asphalt mix* it must meet the following criteria:

1) The sum of the benzene, toluene, xylenes, and ethylbenzene (BTEX) concentration as measured by EPA Method 5030/8020 must be less than 500 ppb; and

2) The total recoverable petroleum hydrocarbon (TRPH) concentration (measured by EPA method 418.1) must be less than 500 ppm.

• *If the soil is to be used as roadbed material*, it must meet the following conditions:

1) The BTEX concentrations must be less than 200 ppb;

2) The TRPH concentration must be less than 100 ppm; and

3) The roadbed must be at least 1 foot above the 100 year high water table.

• *If the soil is to be used as "clean" fill*, it must meet the following conditions:

1) BTEX concentrations must be less than 100 ppb; and

2) TRPH concentrations must be less than 5 ppm.

The fact that asphalt plants are currently providing a significant share of Florida's incineration capacity is a matter of concern. Stockpiles of untreated soil are building up at these plants - far more soil than can legally be used as asphalt mix material - causing the State to look into the need for further regulation of this treatment option.

Air quality control measures are also an on-going concern at all thermal treatment plants. Air quality control regulations for thermal treatment units are designed to provide reasonable assurance that contaminants are not merely transferred from soil to the air.

Air quality guidelines for asphalt plants treating petroleum contaminated soil state that particulate emissions should not exceed the New Source Performance Standards (NSPS) for asphalt-concrete plants (0.04 grains per dry standard cubic foot, and limit opacity to 20%). In addition, the guidelines state that, as a minimum, the petroleum that originally contaminated the soil has to be in compliance with used oil specifications (except for flashpoint).

Based on our experience, we have come to believe that all units should be equipped with an afterburner that maintains at least 1,400°F with at least 0.5 seconds retention time. Also, the recent lowering of the OSHA threshold limit value (TLV) for benzene from 30 mg/cubic meter to 3 mg/cubic meter has caused Florida to rethink the earlier permits issued to thermal treatment units to burn petroleum contaminated soil. We are also reexamining the particulate emission standards, pointing toward new levels of 0.03 grains/dscf, and visible emissions of less than 5% opacity.

• Cement & Clay Kilns

Cement kilns, lime kilns, aggregate kilns and clay kilns are generally rotary kilns constructed of steel casings lined with refractory brick. In most cases, they are much longer than fixed facility rotary kiln incinerators and, therefore, the soils have much longer retention times (3-4 hours) in the burn area of the kiln. Cement and lime kiln temperatures are about 3,000°F; aggregate and clay drying kilns are somewhat less than 2,000°F. The organics in the soil are destroyed, while the inorganic residue is either incorporated into the finished product or collected for disposal or use elsewhere.

Only a few of these industrial kilns are permitted to burn petroleum contaminated soils. Concern for product quality may limit the capacity of these units to deal with very much of the petroleum contaminated soils, although our experience has been that levels of contaminants in the soils after incineration would be suitable for clean fill.

The primary operational concern about industrial kilns is residence time. High temperatures for short periods of time can literally char the outside of some soils, without "cooking" the heavier products out of the center. Soils with high clay content or soils bound in grass clods are particularly susceptible to this "burnt biscuit" phenomenon.

Particle size, residence time, and temperature are emerging as the important factors in all thermal treatment systems. Florida is considering regulations that limit particle sizes to less than somewhere between 1 and 4 inches, require minimum combustor temperatures of at least 700°F and retention times of at least 15 minutes.

Air quality considerations for industrial kilns are generally the same as for asphalt plants. Most kilns should use a precipitator or baghouse to remove suspended particulates in the flue gases.

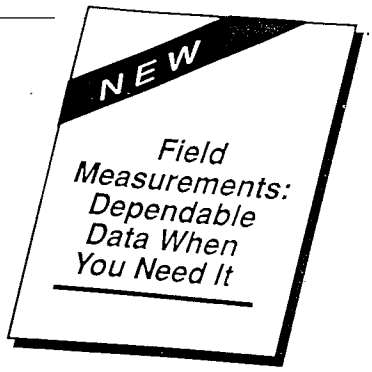
• Rotary Kiln Incinerators

Unlike industrial kilns, rotary kiln incinerators are primarily designed to burn waste. They consist of a long inclined tube that is rotated slowly. The rotation tumbles the waste that is introduced at the high end of the kiln. Combustion takes place as the agitated material falls down the tube. Residue material is collected at the lower end and exhaust gases usually pass through an afterburner before

(Continued on Page 15)

Lab Bypass Procedures

An Improving Technology Spelled Out in a New EPA Guide



Once you get a feel for what can be done using field measurement techniques and equipment, you may well move to curb the tedium of waiting for lab results. With all the hundreds of thousands of UST sites that will need to be investigated over the next few years, state and local UST personnel will be hankering for a quick and reliable means for determining whether corrective action is necessary. Field measurement devices and good field measurement procedures are a means for dramatically reducing the time it takes to conduct a site assessment.

Field measurement procedures can provide immediate and accurate on-site information on the severity and extent of contamination - provided the individual doing the measurement is not a bungler. This information can be used at tank closure site assessments to direct additional investigations, determine the placement of monitoring wells, and help make reliable cleanup decisions that won't compromise the environment by dragging out the whole affair.

Currently there are a couple of schools of thought about soil and water analysis - to lab or not to lab kinds of issues. Many states and consultants require lab analysis of soil and water samples collected at UST sites, because they feel the results are more accurate and they will have "real" numbers that both quantify and qualify contaminants. However, the results are highly dependent on good field sampling and handling procedures. Also, lab results may take as long as 45 days to come back from the lab and they frequently indicate the need for additional sampling.

Then there are the believers in the age old sight-and-smell method of field observation - eyes and noses calibrated to a standard devined by a yogi from Yonkers. The sight-and-smell technique provides immediate, but not particularly accurate results. In addition, it is an unhealthy practice, and the olfactory component can desensitize with over use.

The growing numbers of individuals associating themselves with the "new school of dependable field measurement techniques" will argue that in many cases, field measurements may be more accurate than lab analyses, which suffer inaccuracies due to loss of contaminants resulting from biodegradation and volatilization during sample holding. (EPA studies show losses in the range of 10 to 35% can occur during a 2 to 5 day holding period for benzene, toluene, ethylbenzene, and xylenes (BTEX) in water samples.)

They will also argue that the cost of field measurement is lower, which can reduce the cost of investigation and allow more samples to be taken...on the spot. Taking more and better directed samples gives a clearer picture of the extent of a release, which leads, *ipso facto*, to a better cleanup decision.

Currently, investigators are using a variety of field measurement techniques and procedures to assess contamination at UST sites. In an effort to get state-of-the-art information on this subject out where it's needed, the EPA Office of Underground Storage Tanks has published a new guide, *Field Measurements: Dependable Data When You Need It*, that presents some hands on information on field measurement procedures currently used for UST investigations. The guide identifies applications and limitations of the procedures. It includes:

- A comparative overview of the most common field measurement procedures;
- Descriptions of: General Headspace Analysis of Soil and Water, Dynamic Headspace Analysis Using the Polyethylene Freezer Bag System, Liquid Extraction and Analysis of Water, Hanby Procedure for Soil and Water Analysis, and Active Soil Vapor Sampling Analysis;
- Descriptions of field instruments used in most of these procedures; and
- A list of manufacturers and distributors of field sampling and analysis equipment. ■

To order copies of this publication write: US EPA OUST, P.O. Box 6044, Rockville, MD 20850.

New Soil Extraction Kit Useful for Detecting Diesel Fuel and Heating Oil

A new product not included in EPA's *Field Measurements: Dependable Data When You Need It* guide is a disposable soil extraction kit by International Lubrication and Fuel Consultants of Albuquerque, New Mexico. The kit can be used on-site to detect heavier weight hydrocarbons such as heating oil, diesel fuel, waste oil, hydraulic oil and greases within 30 minutes. If samples are found to be contaminated and further quantification is needed, the kit provides the necessary particulars for sending the samples on to a lab.

The kit is designed to screen soil on-site in the same manner as in the laboratory. It contains a petroleum extraction solvent that will remove petroleum hydrocarbons from soil and take them through filter paper into a small evaporation dish. As the solvent evaporates, it deposits and concentrates any hydrocarbon residue on the mirror finish of the dish so it can be seen or smelled. The process can detect less than 100 ppm of the heavier hydrocarbons.

The kit, which costs $23.95, includes: the solvent, a metal can for mixing the solvent and sample, filter paper, gloves, evaporating dish, additional sample bottle, labels, chain of custody form, instructions, and a postage paid lab shipper. ■

For more information call 1/800/237-4532.

Just The Facts....*Please!*

Evaluating Leak Detection Performance Claims

EPA APPROVED!

EPA CERTIFIED!

BEST METHOD AVAILABLE!

Claims like these abound. Trade papers teem with ads extolling assorted leak detection equipment. Salespeople are just an 800 number away, eager to explain to you why their's is the best available method. You scratch your head and figure some of these claims are more warranted than others. But, how the blazes are you supposed to know what's what? Which methods really work and which claims are bogus?

If you are a tank owner paying for a leak detection testing service or a piece of equipment, or if you are a state regulator who's got the job of approving a piece of equipment, this is not just an academic question. There is a lot at stake - your business, liability, the environment. You need to make a decision based on the facts, not the hyperbole!

To help provide facts about leak detection performance, EPA is encouraging manufacturers to test their equipment (preferably by a third party) according to a few standard procedures and to report their results following a standard format. The results of these tests should provide helpful information to tank owners and regulators. The actual procedures will be of more interest to manufacturers and third party testing organizations.

A new series of documents, *Standard Test Procedures for Evaluating Leak Detection Methods*, provides detailed instructions for testing this equipment. A separate test procedure is available for each of the following types of leak detection:

- Volumetric Tank Tightness Testing
- Automatic Tank Gauging Systems
- Vapor-Phase Out-of-Tank Product Detectors
- Liquid-Phase Out-of-Tank Product Detectors
- Non-volumetric Tank Tightness Testing
- Statistical Inventory Reconciliation Methods
- Pipeline Leak Detection Systems

How the methods are evaluated depends on how they work and what is required in EPA's regulations. For example, tank tightness tests and automatic tank gauging systems are evaluated by conducting a series of tests on a non-leaking tank with various simulated leak rates. The method's performance (in terms of probability of detection and false alarms) is based on how closely the actual and measured leak rates agree. The evaluation of pipeline leak detection systems determines the same parameters by simulating leaks in a non-leaking pipeline (or by using a large database of results from field testing using the method).

Vapor and liquid monitors are tested in a laboratory setting using various components of petroleum at different concentrations and thicknesses. The detector's performance is based on its response relative to the amount of product actually present.

Statistical inventory reconciliation methods are evaluated by supplying the vendor with actual inventory data to which simulated leaks have been added. Performance is determined by comparing the reported to the simulated leak rates.

As a consumer, many of your questions about the performance of a leak detection method should be answered by the short results sheet that is filled out at the completion of the evaluation. For example, the results sheet for tank tightness tests includes the method's probability of detecting a leak of 0.1 gallon per hour and the probability of false alarm. The results sheet also provides important limitations on these performance estimates.

Manufacturers can distribute these completed forms as part of their marketing and sales efforts. Tank owners can keep the results sheets on file to show inspectors that the method they use meets EPA performance standards.

Most tank owners will only be interested in the short results form. People with more in-depth interest in the performance of a system (such as regulators) can ask the manufacturer for the complete evaluation report that includes a detailed description of the method as well as the data obtained during the evaluation.

EPA's standard test procedures are not the only way to evaluate the performance of leak detection methods. For example, the Edison study of tank tightness testing, which was conducted following a separate test procedure that required a specialized test facility, may also be used to prove that a method meets EPA requirements. Evaluations conducted following a national consensus code or standard, such as the one being developed by ASTM, are also acceptable alternatives to EPA's procedure.

The bottom line is, tank owners and regulators should expect manufacturers of leak detection equipment to provide them with an evaluation that supports the method's performance claims. Only then can decisions about leak detection be based on facts rather than sales claims. Keep in mind, however, *these performance estimates are only valid if the tester or installer follows manufacturer directions.* The results sheet provides some consumer guidance by listing the important elements of procedure, so you can check to see that you are getting the method you paid for. For example, the tank tightness test sheet lists minimum tank stabilization waiting times for the specific method.■

For more information: to obtain any one of the *Standard Test Procedures for Evaluating Leak Detection Methods*, write US EPA OUST, P.O. Box 6044, Rockville, MD 20850. Ask for OUST Publication #45 and specify the type of test procedure.

FINANCIAL RESPONSIBILITY U • P • D • A • T • E

Financial Responsibility Compliance Date Extensions

EPA HAS PUBLISHED AN INTERIM FINAL RULE to extend the Category III (marketers owning 13-99 USTs) financial responsibility compliance date, and it has published a proposed rule to extend the Category IV (marketers with 1-12 USTs, non-marketers with less than $20 million net worth, and local governments) financial responsibility compliance date. Petroleum marketers in Category III now have until April 1991 to obtain financial assurance. The EPA has proposed that tank owners in Category IV have until October 1991 to comply with the financial responsibility requirements.

By extending the third and fourth compliance dates, EPA hopes to provide short term relief to UST owners and operators who, as yet, have no methods of financial assurance available to them. These groups generally represent the small gas stations and convenience stores most in need of an effective financial responsibility mechanism. The Agency maintains that the extension of these compliance dates should not adversely affect human health and the environment, because the UST technical requirements for leak detection, tank upgrading, and corrective action remain in effect.

Category II (marketers owning 100-999 USTs) will not receive an extension to their October 26, 1989 financial responsibility compliance date. Information EPA has indicates that a number of insurers are writing UST coverage for this category. In addition, EPA has approved 14 state assurance funds for use as compliance mechanisms and 12 other funds are currently under review by the Agency. While these funds are being reviewed, owners and operators are deemed to be in compliance with financial responsibility requirements for the amounts of coverage the state fund provides.

EPA expects owners and operators to be in compliance with financial responsibility requirements. The Agency is particularly concerned about facilities that have not made good faith efforts to comply with applicable regulations. In terms of enforcement priority, the Agency is more likely to take into account, on a case by case basis, factors such as good faith efforts to comply and sudden incapacity of a financial assurance provider.■

Proposed Financial Test of Self Assurance for Local Governments is Published

OUST HAS PROPOSED FOUR ADDITIONAL mechanisms that will allow local governments more flexibility in meeting financial responsibility requirements by October 26, 1991. The new mechanisms being proposed are:

• **Bond Rating Test** - Local governments with outstanding issues of general obligation bonds rated by Standard and Poor's or Moody's as "investment grade" will be allowed to self-insure. To be eligible to use the test, a local government must have $1 million or more in currently outstanding general obligation bonds.

• **Worksheet Test** - A financial worksheet has been developed that recognizes the unique financial structure of governmental entities. Local governments will use readily available financial data to complete the worksheet and calculate the score. Governments with adequate scores will qualify to self-insure.

• **Governmental Guarantee** - Local government entities will be allowed to obtain a guarantee from the state or other local government with which they can demonstrate a "substantial governmental relationship." Non-state governments acting as guarantors must qualify for self-insurance using the bond rating or worksheet test.

• **Fund Balance Test** - Local government entities may self-administer an UST response fund if appropriate safeguards are met.

The proposal was published in the Federal Register on June 18. Interested parties may comment on the proposal during the 60 day comment period. For further information, contact the RCRA Hotline at 1-800/424-9346 or 202/382-3000 in Washington, D.C., or Stephanie Bergman, OUST, at 202/382-4614.■

QUESTIONS & ANSWERS

Answers to the following financial responsibility questions have been prepared by the EPA Office of Underground Storage Tanks.

Q. *What happens if I have a leak and don't have insurance?*

A. You are still required to clean up and pay for third-party damages resulting from a leak, even if you do not have insurance. Congress made tank owners and operators liable for these costs in a separate portion of the law.

Q. *Other than private insurance, how can I demonstrate financial responsibility?*

A. More and more states are developing state-sponsored trust funds that will supplement commercially available coverage and assist tank owners and operators in covering the cost of cleanups. Thirty-four states have passed legislation creating assurance or cleanup funds. These state fund programs must be submitted to EPA Regional Administrators for review and approval. EPA has approved 14 such funds and is currently reviewing 12 other funds.

Q. *My state fund will cover only part of my financial responsibility, how can I cover the remaining part?*

A. Since state funds can leave the owner or operator responsible for a deductible coverage amount, you need to show your financial responsibility for this amount. If you can't find private insurance for this amount, one solution to the problem can be found in additional state action. Under EPA policy, states can develop a test of self-insurance that owners and operators can use to demonstrate assurance for the amounts not covered by a state fund. The self-insurance test for the deductible is typically designed to assure from $5,000 to $75,000. To date, two states (Alabama and Tennessee) have developed such self-insurance tests.

(Continued on Page 13)

UST EXCHANGE

The UST Exchange is your forum for promoting the exchange of UST experiences, successes, discoveries, frustrations, and anecdotes. If you have such information, get it off your chest! Write Ellen Frye at NEIWPCC, 85 Merrimac St., Boston, MA 02114, or call 617/861-8088.

Pennsylvania's Private Sector Regulatory Approach

While many states have begun UST installer training and certification programs, Pennsylvania is adding a new twist to this by introducing the private sector certified inspector, who will be qualified to verify work done by the certified installer. The certified inspector can also be a certified installer, and vice versa, but the system of checks and balances does not permit inspecting your own installation.

The certified installer is to be enabled to handle all permitting associated with installing or modifying a facility. Once the tank system is installed, the tank owner/operator brings in and pays for the certified inspector who checks out the job and keys into a Tank Installation Module (TIMs), which is a standardized information form for each tank at each facility (system design, registration, permits, etc.). The TIMs module is then sent to the DER, where the information is entered into a computerized main frame storage tank data system (STDS). Provided everything checks out with the computer, a permit is automatically issued. This procedure allows the State to issue large numbers of permits without delay.

Pennsylvania UST regulations are currently being drafted, but the State's UST legislation provides for interim permitting, certification, and technical standards. Because of the large number of UST facilities subject to UST regulation and because of the stringent enforcement authorities accorded the DER, the demand for staff resources to deal with permitting and enforcement could easily become overwhelming and expensive.

By automating the information system and putting part of the program into the private sector, the DER will not have to review each and every permit. Instead, the regulators will kick in after the computer screens the information for compliance and red lights a problem. In the long run the agency expects to save about 70% in staff resources.

As the program evolves, DER's game plan is for private sector inspectors to act as the eyes and ears of the agency for existing facility and tank closure inspections, as well. The State is developing special training courses for each certification category. As of early July, 969 interim certifications had been approved - 427 installers, 491 installer/inspectors, and 24 inspectors only. The DER expects to train and test about 2000 installers and inspectors for permanent certification within the next two years.

Interim certification depends on the applicant's training by the manufacturer for a given tank type (e.g., steel, composite, fiberglass), their knowledge of appropriate standards, etc.. Installers will be certified according to their qualifications. Inspectors will also be certified by the category of inspection they are trained to do.

The interim permitting program is targeted to go on line in August. The registration program requires a sticker for the tank every year. If the tank or facility is not in compliance with state requirements, the computer will generate a letter advising the tank owner that the sticker is dependant on getting the appropriate information into the State. Furthermore, product distributors may not deliver to a tank without a valid sticker. If they do, and the tank leaks, they are also liable.

For more information on this subject, call the Pennsylvania Storage Tank Program at 717/657-4080.

Continued from Page 12

Questions and Answers

Q. *What is EPA's enforcement policy regarding the financial responsibility regulations?*

A. EPA's primary objective in enforcing the financial responsibility requirements is to bring owners and operators into compliance with the regulations. All owners and operators are expected to make good faith efforts to achieve compliance, and enforcement actions must be taken against recalcitrant parties. To achieve these objectives, EPA's enforcement strategy uses a combination of punitive and nonpunitive enforcement responses. For example, EPA may assess more severe penalties against an owner or operator who has had a release and who willfully disregarded the law and chose not to get insurance, even though he or she could have afforded it. For owners and operators who make good faith efforts, the strategy proposes alternative, nonmonetary penalties under which noncompliers will take action to make their tanks more insurable (e.g., by upgrading tanks, conducting tightness tests, or performing site assessments).

Q. *If I can demonstrate financial responsibility for only some of my USTs, or if I can get only partial coverage for my USTs, will I have to pay the noncompliance fine of $10,000 a day?*

A. For each case, the enforcement response will depend on the circumstances of the violation, such as whether assurance is generally available and whether the violator made "good faith" efforts to obtain assurance. However, the strategy places the responsibility for demonstrating compliance, or attempts to comply, on the owner and operator.

Q. *Who has to demonstrate financial responsibility, the owner or the operator?*

A. Either the owner or operator (but not both) of the UST must show financial responsibility, if they are different individuals or firms. It is the responsibility of the owner and operator to decide which of them will show financial responsibility.

Q. *If something goes wrong, is the owner or operator held liable?*

A. Where the owner and the operator of the tanks are not the same person or company, it is EPA's policy to allow them to work out between themselves who will take the necessary steps to comply with the requirements. Under the law and the regulations, EPA can hold both parties liable if neither ensures that the tanks meet the requirements.

EPA HQ UPDATE

Strategy for a National UST Training System

Implementing a national program to train an audience of three to five thousand UST inspectors and twenty to thirty thousand contractors presents a formidable challenge! But OUST, undaunted, has developed a strategy for delivering training on a national scale. It goes like this:

• *First, build a coalition of partnerships with organizations to provide UST training.* As it is , schools, fire academies, and corporations across the country are developing and delivering UST training. The quality of these programs varies, and there are gaps and overlaps in the information offered. OUST would like to help and encourage these organizations to work cooperatively toward developing and delivering quality UST training that is accessible to those who need it. OUST is currently trying to ferret out these groups and discuss their participation in this "UST Training Coalition" and the mutual benefits that would result.

• *Assure that training information is readily available to those who need it.* Although a myriad of UST training activities already exist and new courses are offered weekly, many program personnel are unaware of their availability. OUST sees the need for a "training information network" that provides a reliable source of information on training programs and resources. Such a network will help program personnel take advantage of existing courses and find the help they need to develop new courses or offer existing courses. Over time, this network will play a part in helping national and state program managers determine what new courses need to be developed.

• *Utilize training technologies that are accessible to the learners.* Providing timely and accessible training to those who need it nationwide is a tall order. Relying on a limited set of appropriate training technologies and processes to quickly develop and deliver this training can help. Generally, training is viewed as a stand-up classroom activity. This is an expensive training format that tends to limit both accessibility and timeliness of the training. New training technologies have emerged that combine computer based training, videos, train the trainer courses, and training manuals. They are timely, accessible, cost less, and they reduce training time while improving retention rates.

• *Help customers build their own training capabilities.* The success of the training effort ultimately depends upon the customers' response - in this case, state and local government UST staff and contractors - who take advantage of training materials and courses, utilize the information network, and participate in the definition, development, and delivery of training courses.

Building this national training system will take time, yet efforts are underway to build a coalition and define training needs. States can get involved immediately by letting EPA know about local universities, technical schools, fire academies and other similar training institutions that are interested in helping develop and deliver UST training. States can also take advantage of existing and upcoming training materials and activities. Over the summer OUST will offer a Leak Detection Train the Trainer course to Regional and State program personnel. Also, several videos are available. *For more information contact Steve Vineski, OUST, 202/475-9723.*

EPA Responds to API Request for Technical Changes to UST Rule

On April 27, EPA published a response in the *Federal Register* to a petition by the American Petroleum Institute (API) that requested the Agency to make some technical changes to the 40 CFR Part 280 rules. In the response, EPA sets out its rationale for deciding to not grant the petition request on five of the six issues presented.

In response to the sixth issue, on April 27, EPA proposed a minor change to the spill and overfill design requirements that simply adds a performance standard to the overfill equipment standards. This is in response to API's complaint that the current performance standard under CFR 40 Part 280 would only allow a flow shutoff or restrictor device to be used at the 90 percent filled mark. Thus, for example, only allowing use of 9,000 gallons in a 10,000 gallon tank. The new updated provision allows more flexible positioning of overfill prevention equipment, as long as its ability to prevent overfills meets the performance standard.

EPA received some comments within the 30-day comment period and expects to complete the rule change before the end of this summer. Comments received supported the proposed amendment. The EPA contact on this issue is Kim Green, 202 475-9395.

OUST's UST Poster

OUST developed an UST Poster, *Is This Tank Under Your Town?*, in response to Regional/state preferences for an educational awareness poster directed toward the general public. The poster is designed to make people aware of how USTs relate to our more familiar aboveground world - tanks are important and useful, but they may leak and subsequently pollute groundwater and soil. The poster narrative says what concerned citizens can do if they suspect a tank is leaking. It is 20"x30", printed on recycled paper in full color, and folded to fit into a 10"x 15" envelope.

Normas y Procedimiento Para TSA

OUST has published *Normas y Procedimiento Para TSA.*, a Spanish version of *Musts for USTs*, which summarizes the Federal regulations for underground storage systems.

For information on EPA UST publications write: U.S. EPA OUST. P.O. Box 6044, Rockville, MD 20850.

It's Time to Look for Leaks!

With another major leak detection compliance deadline coming up this December (for pressurized piping systems and tanks installed between 1965 and 1969), OUST has put together another leak detection information folder, *It's Time to Look for Leaks: Leak Detection Outreach Materials*, to help states and other UST-related associations alert the regulated community. The materials, which can be copied and distributed, include:

• A one-page advertisement graphically emphasizing compliance dates and leak detection options.
• A brief article describing the leak detection requirements, including compliance dates, allowable methods, and sources of information for more help.
• A series of flyers on approved leak detection methods.
• A packet of leak detection questions and answers useful for telephone information services.
• A flow diagram with some hints in running an efficient telephone information service.

For information on obtaining specific materials in the folder, contact your state UST program. For a complete set of materials, contact Garrette Clark, OUST, at 202/382-7994.

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Soil Treatment in Florida

venting. Exhaust gases will often be treated further through the use of a scrubber. They are not used in Florida because no one has applied for a permit to build one, as yet.

• Mobile Incinerators

Seven companies have received statewide or regional permits to use mobile soil decontamination units in Florida. The working theory behind most of these units is that soil is heated to the temperature where organic contaminants are vaporized and removed from the soil. Vapors are then passed through an afterburner, which oxidizes the organic constituents to carbon dioxide and water. The off-gases are cooled and scrubbed of particulate matter before discharge to the atmosphere, which satisfactorily handles air pollution concerns..

The advantages of mobile incineration are primarily reduced cost and liability. Cost to transport soil to off-site facilities are eliminated. Liability associated with off-site disposal of treated soil is avoided. Cost associated with bringing in clean fill to backfill the excavation is also not a factor, because the incinerated soil is right there to be returned to its old turf.

Another advantage that we thought mobile incineration would provide is rapid, one step cleanup in, more or less, a continuous operation. However, we are experiencing some difficulties with this approach in actual application.

The most serious drawback pertains to the moisture content of the soils. When soils contain a lot of moisture (like most of Florida's soils) the system requires considerably more energy and residence time before the moisture evaporates and the soil temperatures are high enough for complete decontamination. This results in higher operating costs and reduced daily throughput for the unit.

To overcome this, a number of companies are stockpiling soil on-site and allowing it to dry out before bringing the treatment unit on-site. This obviously reduces some of the fast turn around advantages, but the systems still provide a very good soil treatment alternative.

Improving As We Go

None of these techniques are perfect - they all have their limitations and appropriate applications. It is clear, however, that we are going to need them all to treat the volumes of contaminated soils that continue to require treatment.

(Continued on Back Page)

Field Notes

from Robert N. Renkes, Executive Vice President, Petroleum Equipment Institute

Yes, Accidents Do Happen During Tank Removal!

• A Wisconsin farmer died in June from injuries he suffered earlier when a UST exploded while he was cutting it up with a saw. Sparks from the saw apparently ignited fumes from fuel that remained in the tank.

• An employee of a tank removal company in Georgia died in April when the 10,000 gallon UST his firm had just removed exploded. OSHA investigators are still trying to determine what caused the explosion. It was the third death in Georgia involving a tank closure in less than a year.

• A Tulsa, Oklahoma man was killed this spring when a metal cutting saw created a spark, which ignited gasoline vapor in the tank his crew was working on. The explosion blew the end from the tank and decapitated him.

These are just three examples of what can happen during a tank removal/disposal project. Although we don't keep score, we have personal knowledge of 20 or so explosions that occurred during a UST removal this past year. Understand, PEI does not subscribe to a newspaper clipping service - word of all these tragedies was sent to us by members who read about an accident and took the time to send the information to us. My point is, suppose PEI only hears about, say, one in five tank explosions? That extrapolates to about 100 tank explosions a year.

The real tragedy is, every one of these accidents could have been avoided. We have identified over a dozen publications and videotapes that explain how to properly do this kind of work (contact *LUSTLine* for an information list). These safety procedures, when strictly followed, will help insure safe tank removals.

Why do people continue to lose their lives decommissioning tanks? First, we have a record number of tanks coming out of the ground. That translates into a lot work. The upshot of that is many new, inexperienced firms are entering the market everyday. Second, generally speaking, tank removers are not licensed or certified. Any person or firm (often the low bidder), regardless of experience, can remove tanks in most states. While more than half of the states have seen fit to license tank installers, less than a dozen states require a licensed or certified tank remover.

Here are three things that, in my opinion, could help turn this lamentable situation around:

• States need to find some way to reach all removal contractors and make certain they know the proper methods. This may involve a licensing/certification program.

• OSHA and the fire service, sooner or later, will recognize that this needless loss of life and damage to property can be avoided and develop a program to reach these people. Perhaps a permitting program would help.

• Finally, tank owners can make an issue of safety when they contract with a company to remove their tanks. Qualifications and experience in safe tank disposal should be as important as price.■

OSHA'S NEW HEALTH AND SAFETY REGULATION, 29 CFR 1910.120, sets new health and safety requirements for field personnel working with hazardous waste. This regulation applies to field personnel working around petroleum UST's, because the definition of a "hazardous substance" includes the Department of Transportation's list of hazardous substances, which includes petroleum. While this rule clearly applies to UST personnel involved in cleanup action, it is not clear whether it also applies to those involved with tank closure inspections. OUST is seeking a formal interpretation on this subject.

Nevertheless, since it is mainly better to err on the side of caution, if you are involved with tank removal, why not contact your local OSHA office to obtain a copy of this rule? At a minimum, UST field personnel who inspect tank closures would be wise to have twenty-four hours of health and safety training.

Stay tuned to updates on this subject.

LUST LETTERS

We received a letter from J. Frank Conley, Operations Manager at Tiger Fuel Company in Charlottesville, VA that reflects the frustration many tank owner/operators experience in shopping for leak detection devices. Here is an except from the letter:

I have just finished reading *LUSTLine* Bulletin #12. EUREKA! Finally someone has something intelligent, understandable and technically oriented to say about meeting the EPA's leak detection mandates. I especially enjoyed *The Leak Detection Dilemma* article by Marcel Moreau. I'm so tired of hearing from my various vendors who promote products that will discover leaks within tolerances that will satisfy N.A.S.A.; alarm systems that will produce statistical graphs with enough bells and whistles and gizmos that are sure to provide more amusement to our average gas station employee (at $4.00/hr. wage) than his quarter spent at the local amusement arcade. From the talk of the vendors, I'm sure that these devices have the computing power that would make them useful in balancing the national budget when they are not monitoring my USTs.■

To order copies of LUSTLine, Bulletin 13, call Hotline (800) 424-9346. To add your name to the LUSTLine Mailing List, call (617) 367-8522

To succeed in meeting our primary objective - cleaning up sites without transferring the problem from one medium to another - we will need to continue improving the logistics of employing these options, through modifications and appropriate regulatory controls.■

John Ruddell is Bureau Chief for the Florida Department of Environmental Regulation's Bureau of Waste Cleanup

For more information on the Florida soil treatment program call Don Ehlenbeck at 904/488-0190.

PROFILE OF A MOBILE INCINERATION UNIT

For your information, here is a description of a mobile incineration unit manufactured and operated by TPS Technologies Inc. This unit is referred to as a mobile Soil Remediation Unit (SRU) and is specifically designed to treat petroleum contaminated soils. It is not the only unit or design on the market, but it is a good illustration of this type of system.

The working theory associated with this unit is similar to other thermal treatment systems:

- Soil is heated.
- The gases are filtered through a baghouse to remove dust and particulates.
- The "clean" vapors are passed through an afterburner which oxidizes the organic constituents to carbon dioxide and water before discharge to the atmosphere.
- The treated soil is cooled and any dust suppressed in the discharge systems.

The system itself consists of:

- A feed hopper that regulates the flow of material into the primary chamber.
- The primary combustion chamber, or rotary kiln, in which the soils are heated to approximately 1600°F using #2 fuel oil - resulting in soil discharge temperatures between 800°-900°F.
- The burner is located at the discharge end of the primary chamber, resulting in a counter-flow design.
- Flow gases from the primary chamber are directed into a baghouse for particulate removal.
- Gases then flow to the afterburner.
- The afterburner is designed to operate at 1400°-1800°F with a gas retention time of 0.6 seconds.
- Performance results in 99.9% of the design VOC reduction with particulate emissions less than 0.04 gr./dscf.
- Soil cleanup results in:
  Hydrocarbon contents ranging from non-detectable to 10 ppm
  Benzene <100 ppb
  Toluene < 100 ppb
  Xylene <100 ppb
  This particular system can process all types of soils and petroleum-based contaminants as heavy as #6 fuel oil.

LUST LINE

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