

news

TerraQuest is celebrating our fifth anniversary this year and would like to thank all of our loyal clients for their support. We are constantly working to improve our services and to be responsive to our clients' needs. If you have any questions or concerns regarding our services, please contact us.

We are nearing completion of our revised website and hope to have it up in approximately 30 days. You will find the website easier to navigate. There will be a new section that contains many downloadable articles on various topics and also links to various environmental sites. Please visit our website at www.terraquestpc.com for further information.

RESIDENTIAL HEATING OIL TANKS



Home heating oil tanks are classified as non-regulated, non-commercial underground storage tanks (USTs). Most heating oil tanks do not require registration with the State and are not required to meet certain technical regulations. Tanks that have had a leak are required to be assessed and remediated in accordance with North Carolina Division of Waste Management (NCDWM-UST) regulations.

There are no State regulations requiring the removal or closure of residential heating oil tanks that have not leaked. Most UST removals or closures occur because a potential property buyer or lending agency is concerned about the possibility of contamination from the tank. Once contamination is detected, the work must be performed by a Licensed Geologist.

There are a variety of approaches for dealing with heating oil USTs and each has its own limitations

and benefits. One approach is to collect soil samples from around the tank and / or beneath the tank. If no contamination is detected, the tank could be properly abandoned using an inert material such as foam. Once the foam solidifies, it will provide structural integrity to the tank and minimize the chance of water accumulating in the UST. Prior to foaming the tank, all residual liquids and sludge need to be removed from the tank. An in-place closure or abandonment report may satisfy a potential buyer or lending agency. Cost for in-place closure is typically less expensive than removal. If a release is discovered during the initial sampling, it is not advisable to abandon the tank, because future work may require that the tank be removed. Thus, the cost for foaming the tank would be wasted.

In some situations, the buyer or lending agency requires that the tank be removed. This option costs more than in-place closure because of excavation equipment and disposal costs. Also, if contamination is encountered, the NCDWM-UST requires that soil excavation be conducted. The purpose of conducting the soil excavation is to remove the contamination so that the release incident can be closed without further assessment.

(cont. on page 2)



IN THIS ISSUE

RESIDENTIAL HEATING OIL TANKS (CONT.)	2
LABORATORY WINS AWARDS	2
PHYTOREMEDIATION IN NC	3
DANGERS OF LEAD-BASED PAINT	3
MOLD SAMPLING	4

RESIDENTIAL HEATING OIL TANKS (CONT. FROM PAGE1)

Even if the soil excavation and disposal costs are several thousand dollars, it is generally less expensive than continuing the assessment. If the analytical results from soil samples collected after the excavation still indicate the presence of contaminants at concentrations greater than allowable levels, further assessment will be required. Thus, the next step would be the completion of a limited site assessment. During this phase of work, one monitoring well is installed to test soil and groundwater quality. Also, a reconnaissance of the area is performed to determine if there are any nearby sensitive receptors such as drinking wells and water bodies.

Who is responsible for the cleanup costs? Primarily, the statutory tank owner is responsible for cleaning up the contamination. Who the statutory tank owner is depends upon when the tank was last used. If it was last used before November 8, 1984, then the last party who used that UST is considered the tank owner (even if that party no longer owns the property). If the tank was last used on or after November 8, 1984, anyone that owned the tank thereafter would be considered the tank owner even if that person never used it. There are also many other considerations as to who might be responsible for the cleanup cost. If you have specific questions regarding a site,

please contact Jonathan Grubbs.

Who pays for the cleanup cost? In a sense, we all do. North Carolina has a non-commercial trust fund to reimburse responsible parties for certain costs related to the cleanup from residential tanks. Funding for the non-commercial fund is provided by a motor fuel and kerosene inspection tax and excise taxes (0.047 cents per gallon) on motor fuel and kerosene sales.

Prior to receiving monies from the trust fund, an application must be submitted. Approving the application typically takes 3–4 months. Claims cannot be submitted until the application is approved. As phases of work are completed, a claim can be submitted. Typically, it takes 3–5 months for claims to be reimbursed. The responsible party is responsible for paying the cost of the cleanup and then they are reimbursed from the fund. Certain costs are not reimbursable.

I heard the trust fund was broke? No, the fund is not broke. As of April 15, 2005, the non-commercial fund had a balance of \$3.1 million with \$2.8 million in claims waiting to be paid.

ENVIRONMENTAL SCIENCE LABORATORY WINS AWARDS

Environmental Science Laboratory (ESC) has been honored with a Business Achievement Award in the Technology Merit Category by the Environmental Business Journal. ESC, located in Mt. Juliet, TN, analyzes samples for TerraQuest.

The Business Achievement Award was for adaptation of the Buchi Syncore process to reclaim solvents. This process reduces air pollution from environmental laboratories by reclaiming over 90% of the solvents used. The process developed by ESC



utilizes Buchi Syncore equipment to concentrate dichloromethane and other solvents required for the analysis of semivolatile organic compounds. The environmentally friendly process also has some

other benefits. The equipment requires less space than previous reclamation equipment and also increases lab productivity.

ESC was also voted the 2005 Business of the Year by the Mt. Juliet / West Wilson Chamber of Commerce. ESC, founded in 1970 by Dr. Arthur Schuler, currently has 65,000 square feet of laboratory space and 167 employees.

The Mid-Tennessee Chapter of Associated Builders and Contractors recognized ESC's laboratory expansion project for its quality and innovation of construction with an ABC Construction Award of Excellence. The project included the design and construction of a 14,700 square foot addition to the existing laboratory complex.

TerraQuest has utilized the services of ESC for many years because of their commitment to quality and client satisfaction. Their online reports have greatly increased our ability to make quick decisions regarding site assessments.

PHYTOREMEDIATION IN NORTH CAROLINA



An article in the March 25, 2005 edition of the Greensboro News & Record discussed phytoremediation plans to address groundwater contamination within 160 acres of land located

along Riverdale Drive near Deep River. Deep River feeds the Randleman reservoir; a future source of drinking water for the Triad community.

In the past, the City of Highpoint operated a landfill and Seaboard Chemical operated a chemical recycling facility in the subject area. Groundwater contamination in the form of 1,4-dioxane, stems from these facilities and is a danger to human health and the environment if it is left untreated. The US Department of Health, Education, and Welfare's National Toxicology Program

lists 1,4-dioxane as an industrial and lab solvent used in lacquers, paints, dyes, resins, oils and waxes. The compound has proven a fatal carcinogen in lab rats.

The Environmental Protection Agency's Technology Innovation Program has stated that conventional groundwater treatment methods such as air stripping (violently blowing air through water to allow contaminants to volatilize) and carbon filtration are not effective methods of remediating 1,4-dioxane contamination. Both the EPA and the Great Plains/Rocky Mountain Hazardous Substance Research Center Consortium note that phytoremediation appears to be an effective method of dealing with 1,4-dioxane contamination. Allowing plants to take up the compound proves useful in two ways. Some plants can break the compound down into harmless compounds naturally. Also, since the half life of this compound is many years while it is located in water, but mere hours once it is released into the at-

mosphere where it interacts with other compounds to become harmless, some plants are helpful in that their natural respiration process releases the compound into the atmosphere for this to happen.

The City of Highpoint and Seaboard Chemical have planted several different kinds of trees in the contaminated area and are irrigating the trees with the 1,4-dioxane contaminated water. If testing shows that the trees prove effective at removing or destroying the compound, future activities may include planting even more trees to allow phytoremediation to clean up this site.

Additional information on phytoremediation is presented in the lead-based paint article below. If you would like additional information on phytoremediation or to discuss specific applications, please contact Michael Brown.

LEAD-BASED PAINT CONCERNS

Lead-based paint has been an issue for years. As time goes by and paint flakes off walls, the possibility exists that children and pets can ingest the paint, causing harm to themselves. A recent article in the Greensboro News & Record addressed this issue and focused on the safety precautions the government has in place to prevent lead poisoning. Federal law requires tenants or property buyers to sign a lead warning statement if the property contains a structure older than 1978, the year that lead-based



paint was banned. The property owner discussed in the article did not acquire a signed lead warning statement from his tenant and the tenant stated that she was not verbally advised of the possibility of lead-based paint either. The landowner stated that he did not know that children would be living in the house at the time he rented the property. Nevertheless, children moved into the house and became poisoned by the lead.

Lead poisoning, depending on the amount, can illicit human responses ranging from low IQ to brain damage in severe cases. Unfortunately, the symptoms of lead poisoning may not become apparent until after the damage is done.

Once lead paint is identified, precautions should be taken to reduce

the chances of exposure. This may mean that loose paint be removed and the area be painted to prevent contact with the lead-based paint.



For lead that has accumulated in soil, there are various remedial options, including excavation, encapsulation, and phytoremediation. One promising method of phytoremediation involves the use of ferns and turf grass to remove metals from soil. Edenspace Systems Corporation has been awarded a grant from the U.S. Department of Housing and Urban Development to conduct phytoremediation at ten Baltimore homes in 2005.

TerraQuest Environmental Consultants, P.C. is a full service environmental consulting company providing assessment and remediation services to various industries. Our highly trained staff is OSHA certified and able to provide clients with high quality, cost competitive services. If you have any questions regarding our services, please contact us.

Specializing In:

- Phase I/Phase II audits
- Soil and Groundwater assessment and remediation
- Drilling and Geoprobng
- UST removal and in-place abandonment
- Permitting
- Pilot testing
- Expert witness testimony
- Brownfields



SAMPLING FOR MOLD

The following article is provided by Trevor Lumley, PhD of Environmental Science Corporation.

Mold growth and associated health problems, especially hypersensitivity pneumonitis and other allergen-induced disorders, have received a lot of attention over the past decade. There is as yet no agreement on Permissible Exposure Limits (PEL's) or Threshold Limit Values (TLV's) for mold spores and, consequently, there is no single widely accepted criterion for "passing" or "failing" a sampling area. There are, however, certain principles that can be applied to assess the presence or degree of mold contamination. In this bulletin, I will elaborate on those and discuss some of the theories of sampling methodology, and how it can be applied to assessment for mold contamination.

First, it must be made very clear that mold spores can be found virtually anywhere there is air—most spores are carried easily by air currents, and the number of samples (from 10's of thousands) that I have seen with no spores can be counted on one hand. Most molds that are commonly found indoors are very

abundant in nature; usually found growing on leaf litter, trees, rotting fruits, or any other vegetable matter. The vast majority are cellulolytic that is they grow on and ultimately consume, anything that contains cellulose. This also makes these organisms decomposers of building materials that contain cellulose; including wood, drywall paper, paper wall coverings, jute-baked carpets, and many adhesives. Other common household items such as cardboard, paper, clothing or even dust, in some cases, can also support mold growth given enough moisture. The occurrence of mold can be a problem for two reasons. First, its growth on cellulosic materials can cause integrity failure in building materials. This phenomenon is exemplified by fungi referred to as "wood decay" fungi, which break down cellulose and lignin in a process that can significantly weaken the structural integrity of a building frame. Second, active mold growth typically releases spores or other fragments which contain toxins that, if inhaled in high enough numbers, can cause

a hypersensitivity or allergic reaction.

For the purpose of mold assessment and control, we can think of mold as occurring in two modes: surface and air. Obviously this is a completely artificial distinction, given that airborne spores come from surface mold and the same airborne spores ("colony forming units") can give rise to more surface contamination. Still, sampling for surface contamination requires visual inspection, whereas the degree of airborne contamination can only be assessed by laboratory analysis of air samples. Future technical bulletins will focus on specific sampling strategies and the tools available for interpreting results.

If you have any questions regarding mold sampling, testing, or our other services, please contact us.

TERRAQUEST ENVIRONMENTAL CONSULTANTS, P.C.
209 E. MAIN STREET
CARRBORO, NC 27510

919.932.1590
919.932.1594

www.terraquestpc.com