

# VAPOR MONITORING

## **What is Leak Detection and why is it Necessary?**

In the late 1980s and early 1990s, Federal and State regulations went into effect which were designed to help prevent leaks from regulated petroleum underground storage tanks (USTs) and their associated piping. These regulations were implemented due to the continued detriment of the groundwater quality and to prevent future petroleum releases from contaminating soils and groundwater. These rules require that owners and operators have release (leak) detection, corrosion protection, and spill/overflow protection upon installation. USTs installed prior to December 22, 1988 are required to have leak detection and must have corrosion protection and spill/overflow protection in place.

**Note: USTs installed on or after November 1, 2007 cannot use this method of leak detection.**

The purpose of this brochure is to provide you with information concerning VAPOR MONITORING, one of the available methods for meeting the leak detection requirements set forth for all regulated petroleum USTs installed prior to November 1, 2007.

## **What is Vapor Monitoring?**

Vapor monitoring is a stand-alone form of leak detection (not subject to periodic tank or line tightness testing) that uses monitoring wells as testing locations for leaking product. Tiny pores between individual grains of soil allow the petroleum products to become volatile and move through the soil (vaporize) in the excavation zone (UST pit). Vapor monitoring wells are placed in strategic locations so they can intercept any petroleum vapors that may be moving through the soil due to a leak. Vapor monitoring can detect leaks in tanks and piping.

## **What records do I need for an inspection?**

It is the responsibility of the owner and operator to provide accurate semi-monthly (every 14 days) testing data for the compliance inspection. The inspector will be looking for the following information at your compliance inspection:

1. The last 12 months of your leak detection records which show that the vapor wells were checked every 14 days. If vapor monitoring has not been carried out for 12 months, leak detection records from other methods must be reviewed for the balance of the year.
2. Documents which demonstrate that the proper notification procedures were followed if any vapor concentrations exceeded background concentrations during the past 12 months.
3. The excavation zone assessment that states that vapor monitoring is an acceptable method for this site and that a qualified person has addressed all of the above requirements.
4. The third-party certification for the vapor sensor (if applicable).

## **What do I do if I have a leak?**

When using vapor monitoring as a monthly monitoring method, a leak should be suspected

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if any indication of hydrocarbon vapors is found during the semi-monthly testing. You must contact the UST Section and submit a UST-17A, UST Suspected Release 24 Hour Notice Form, within 24 hours of receiving information regarding a leak. A leak investigation, in accordance with 15A NCAC 2N .0603, must be conducted within seven days,

## **Assessment for Vapor Monitoring must show:**

\*The backfill is sufficiently porous to allow diffusion of vapors (e.g., gravel, sand, crushed rock); The stored product is volatile enough to result in a vapor level that is detectable by the monitoring devices in the UST pit in case of a leak from the tank; Groundwater, rainfall, soil moisture, or other interferences will not hinder detection of a leak, Background contamination on the UST pit will not interfere with the method used to detect leaks from the tank; and The number and positioning of the monitoring wells are sufficient to detect leaks from any portion of the tank system.

## **Key Elements of a Vapor Monitoring System**

### **Monitoring Wells**

The monitoring wells used for vapor monitoring must be constructed according to state regulations 15A NCAC 2N .0504. They must be clearly marked and locked to prevent tampering or unauthorized access.

### **14 Day Testing**

The monitoring wells must be checked every 14 days to determine if any petroleum vapor is present indicating a leak in a tank or line. A vapor detector is used in conjunction with monitoring wells to detect the presence of petroleum vapors. Sensors come in a variety of shapes and sizes. Federal and State regulations require a third-party certification for each type of sensor used. Choose one that best fits your leak detection needs.

### **Soil Assessment**

A qualified person\* must conduct a soil assessment of the UST pit before employing a vapor monitoring system for leak detection. The assessment will determine if site conditions are suitable for vapor monitoring. Certain soil and groundwater characteristics must be identified before a vapor monitoring system can be utilized. The assessment also determines the positioning and the minimum number of monitoring wells or devices that will detect a leak from the UST system.

### **Disadvantages**

You do not know about the leak until a great deal of soil (and potentially groundwater) has already been contaminated. This could lead to expensive cleanup costs.

This method is very site-specific; it might not work at your facility due to soil and/or groundwater conditions. Therefore, a site assessment is required of the subject facility by a qualified person for this to be an applicable method.

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## **Common Questions**

I use vapor monitoring on a monthly basis. What records do I need for a compliance inspection?

- 1) You need at least the last 12 months of vapor monitoring well test results indicating that they were checked every 14 days;
- 2) Third party evaluation for hydrocarbon sensor (contact sensor vendor if you need one).
- 3) Assessment of excavation zone by a qualified person.

## **I have pressurized piping and use vapor monitoring. Do I need an annual line tightness test?**

No, because vapor monitoring is an allowable monthly monitoring method for piping installed prior to November 1, 2007. (This holds true for suction piping as well.) Wells must be placed every 50 feet along the piping runs such that a leak from the piping can be detected. However, all pressurized piping systems must have an automatic line leak detector that must be tested annually.

## **When do I have a leak?**

You have a suspected leak when there is an indication of petroleum hydrocarbons in the vapor monitoring wells. Once a leak has been identified, follow the notification requirements described above.

## **Who is a "qualified person"?**

A "qualified person" is one who, through training and experience, is competent to evaluate the UST site. We recommend that this person be a registered Professional Engineer or a Licensed Geologist.

## **Additional Policy Notes:**

On April 24, 1995, the Division released a letter detailing the applicability of vapor monitoring systems started before the state regulations came into effect. If you are using vapor monitoring as a method of leak detection, it MUST comply with current requirements. This includes having an assessment conducted to verify site conditions. For systems that do not meet all of the requirements set forth in 15A NCAC 2N, owner/operators have two options:

1) Correct all deficiencies of the system (i.e., have a qualified person assess the site suitability, well construction and locations, etc.).

**OR**

2) Abandon on-site wells and begin another form of leak detection.

**For more information about this topic**, contact the DWM Central Office at:

NCDENR Division of Waste Management

UST Section

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The purpose of this brochure is for general guidance. More specific information on UST regulations can be found in 15A NCAC 2N.