

Requirements for Vapor Monitoring

The purpose of this document is to assist UST owners and operators in understanding the vapor monitoring release detection requirements.

LAC 33:XI.701.A.5.a lists the external release detection device construction requirements:

LAC 33:XI.701.A.5.External Release Detection Devices

- a. *General. External release detection devices (RDDs) consist of slotted (screened) piping installed within the excavation zone to permit either the testing or monitoring of vapors or the testing or monitoring for liquids on the water table. All RDDs must meet the following requirements.*
 - i. *All RDDs must have a 4-inch inside diameter and be constructed of either polyvinyl chloride (PVC), polytetrafluoroethylene (PTFE), or stainless steel, and must be chemically compatible with the stored product. The screened interval must be commercially fabricated, slotted, or continuously wound. Screen size must be 0.01 inches. No solvents, glues, epoxies, thermal processes, or rivets shall be used.*
 - ii. *The screened interval must extend from 1 foot beneath the ground surface through the entire excavation zone.*
 - iii. *Each RDD must be sealed from the ground surface to a depth of 1 foot and provided with a locking cap. Each RDD must be installed in such a fashion as to preclude the introduction of surface contaminants into the RDD.*
 - iv. *No RDD shall be installed within or penetrate native soils unless the hydraulic conductivity of the native soil is no less than 0.01 centimeters per second.*
 - v. *If only one UST system is located within the excavation zone, at least two RDDs must be installed. For excavation zones containing between two and four UST systems, at least four RDDs must be installed. If more than four UST systems are situated within a common excavation zone, additional RDDs shall be installed as appropriate to ensure adequate coverage for release detection. If, prior to the implementation of these regulations, fewer RDDs than required in this Clause were installed at a specific location, the owner or operator may request a variance by demonstrating to the satisfaction of the administrative authority that the excavation zone in question can be adequately monitored.*

LAC 33:XI.701.A.5.b lists the vapor monitoring requirements:

- b. *Vapor Monitoring. Testing or monitoring for vapors within the soil gas of the excavation zone must meet the following requirements.*
 - i. *The materials used as backfill must be sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area.*

- ii. *The stored regulated substance, or a tracer compound placed in the tank system, must be sufficiently volatile (e.g., gasoline) to result in a vapor level detectable by the monitoring devices located in the excavation zone in the event of a release from the tank.*
- iii. *The measurement of vapors by the monitoring devices must not be rendered inoperative by the groundwater, rainfall, or soil moisture, or other known interferences, so that a release could go undetected for more than 30 days.*
- iv. *The level of background contamination in the excavation zone must not interfere with the method used to detect releases from the tank.*
- v. *The vapor monitors must be designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system.*
- vi. *In the UST excavation zone, the site must be assessed to ensure compliance with the requirements in Clauses A.5.b.i-iv of this Section and to establish the number and positioning of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product.*
- vii. *Monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.*

Introduction

Vapor monitoring is a method of monthly release detection that can be used for tanks and piping. Petroleum leaks from underground storage tanks volatilize and the resulting vapors migrate through the backfill to the external release detection devices (RDDs). Vapor monitors are devices that are used to measure the vapors from the released product that migrates to the RDDs.

RDD Construction

RDDs used for either vapor monitoring or groundwater monitoring must be constructed in accordance with LAC 33:XI.701.A.5.a as outlined above. If vendors have specific RDD construction requirements for their method that vary from the regulations, they must be approved by the Department.

Backfill Requirements

Backfill between the UST system and the RDDs must be porous and permeable (LAC 33:XI.701.A.5.a.iv and LAC 33:XI.701.A.5.b.i). Backfill that consists of pea gravel, sand, or crushed rock is acceptable for use with vapor or groundwater monitoring without a permeability assessment. Native soil backfill must be assessed and the hydraulic conductivity of the soil must be no less than 0.01 centimeters per second.

Backfill permeability assessment reports should include the following information and must be maintained throughout the life of the release detection system (LAC 33:XI.705.A.1):

1. Permeability of the backfill material
2. Location of all permeability samples taken
3. A scaled drawing of the UST system
4. Depth from the ground surface to the tank bottom
5. Location and identification number of each monitoring well
6. Monitoring zone based on permeability if backfill is not homogenous
7. Documentation that observation points will detect a release within 30 days

Products Monitored

The stored regulated substance, or a tracer compound placed in the tank system, must be sufficiently volatile (e.g., gasoline) to result in a vapor level detectable by the monitoring devices located in the excavation zone in the event of a release from the tank (LAC 33:XI.701.A.5.b.ii).

Vapor monitoring is not always an acceptable method of release detection because some hydrocarbons (diesel, used and new oil) have low levels of volatility. To conduct vapor monitoring for these compounds, the vapor monitor must be able to detect the compound. The UST owner or operator must provide documentation that the vapor monitor utilized can detect these compounds, such as a third party evaluation or manufacturers statements. Most vapor monitor manufactures require calibration with hexane in order to be able to detect diesel. Tracer compounds may be added to the product, and the vapor monitor can be used to detect the tracer compounds. Documentation

proving that the release detection method will work must be maintained throughout the life of the release detection system (LAC 33:XI.705.A.1).

Monitoring Devices

In addition to the requirement that the vapor monitoring device is capable of detecting the type of product stored in the UST, the devices must be properly calibrated and maintained. Vapor monitoring devices must be calibrated and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability and running condition, as specified in LAC 33:XI.703.A.1.b, and documentation must be maintained for at least three years after the servicing work is completed (LAC 33:XI.705.A.3).

RDD Placement

The release detection method used must be capable of detecting a release from any portion of the tank and the connected underground piping that routinely contains product (LAC 33:XI.703.B.1.a).

1. RDDs must be properly placed as outlined in LAC 33:XI.701.A.5.a.v for the tanks.
2. RDDs used for piping must be constructed in accordance with LAC 33:XI.701.A.5.a, and placed along the piping trench and dispensers at least every 30 feet for existing piping trenches, or at each piping joint but not to exceed every 30 feet for newly constructed piping trenches, and one RDD at each pump island (LDEQ 2/25/93 Memo). Any deviation from piping requirements listed above will require a demonstration, to the satisfaction of the Department, that the excavation zone in question is adequately monitored. If RDDs are used for piping release detection, then RDDs must also be located in the tank hold for release detection monitoring of the piping that is located within the tank hold. See [Appendix A](#) to view the department's policy on release detection on devices dated February 25th, 1993.

Interferences with Water and Background Concentrations

The measurement of vapors by the monitoring device used must not be interfered with by the presence of groundwater, rainfall, soil moisture, or any other factor.

Background concentrations in the backfill need to be established prior to beginning vapor monitoring. Background concentrations should be determined at the time the RDDs are installed. If vapor monitoring is started after the UST system has been in service and after the RDDs are in place, background concentrations should be an average concentration of the first few months of data. If high readings are discovered initially upon start-up, this may indicate a prior release, and notification must be made to LDEQ in accordance with LAC 33:XI.707 and release investigation and confirmation steps taken (tightness testing and a site check performed) in accordance with LAC 33:XI.711.

High background levels must not interfere with the method used to detect releases (LAC 33:XI.701.A.5.b.iv). If vapor monitoring is used at a site that has had a prior release, a statement from the manufacturer or third party evaluation is required that demonstrates that the method used will detect a new release.

UST owners and operators may switch to groundwater monitoring when high groundwater is present in RDDs. UST owners and operators must keep three years of release detection records. If switching methods from vapor to water, or vice versa, the release detection records must reflect the change in method used, and the UST-REG-02 form must indicate that both methods are used.

Reporting Suspected Releases and Recordkeeping

According to LAC 33:XI.703.A.2, when a release detection method indicates that a release may have occurred, owners and operators must notify the Department in accordance with LAC 33:XI.707-713. Notification must be made to LDEQ Single Point of Contact (SPOC) at (225) 219-3640 during office hours or (225) 342-1234 after hours. Notification must be made within 24 hours of becoming aware of the occurrence, unless the monitoring device is found to be defective, and is immediately repaired, recalibrated, or replaced, and additional monitoring does not confirm the initial result. If the monitoring device is found to be defective and a suspected release was not reported to the Department, the owner/operator should document that the device was defective and the actions taken for correction. This documentation should also include the additional monitoring results.

Any of the following may constitute a suspected release:

1. Any automatic or continuous monitoring device which signals an alarm.
2. Observation of any liquid product during manual groundwater monitoring.
3. A significant change in hydrocarbon levels above background is detected during a monthly vapor monitoring.

A significant increase in hydrocarbon levels must be reported to the Department as a suspected release. There is no established concentration that requires reporting. Background concentrations must be established prior to beginning vapor monitoring. A significant increase in hydrocarbon levels above the established background levels is considered a suspected release. Since the regulations do not specify a particular background level that requires reporting, owners and operators that use vapor monitoring can consult with the equipment vendor on what concentration levels above background that they consider will indicate a release. Some vendors use a graphical representation of the volatile readings, and consider a release when the measured volatile concentration line is increasing above the background line. Some vendors use two standard deviations measured above the background level.

Monitoring results must be kept for each month and should include, but not necessarily be limited to the following:

1. Date the monitoring took place.
2. Well number or some other means of identifying the RDD.
3. Depth to groundwater (if present) from ground surface.
4. Monitoring results.
5. The vapor reading reported in parts per million.
6. The background concentration determined for the site.
7. Type of monitoring device and date last calibrated.
8. Name and initials of person taking the reading.
9. If a suspected release was detected describe what actions were taken.

Release detection records must be maintained for three years and must be made available to the Department during an inspection. Records pertaining to the installation of the vapor monitoring system should be maintained. Records of all calibration, maintenance, and repairs of release detection equipment used must be maintained for at least three years after the servicing work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for five (5) years from the date of installation. [Appendix B](#) contains a Vapor Monitoring Record template.

APPENDIX A



State of Louisiana

Department of Environmental Quality



Edwin W. Edwards
Governor

February 25, 1993

Kai David Midboe
Secretary

MEMORANDUM

TO: Regulated Underground Storage Tank (UST) Community

FROM: Glenn A. Miller, Assistant Secretary *GAM*
Office of Solid and Hazardous Waste

SUBJECT: Revision to the Policy Memorandum dated August 20,
1991-Regarding Release Detection Devices (RDDs) for
UST Piping

The Louisiana Underground Storage Tank Rules and Regulations, Section 701.B.3, provides that any of the RDD methods in LAC 33:XI.701.A.5-7 may be used as a method of release detection for UST piping if they are designed to detect a release from any portion of the underground piping that routinely contains regulated substances. As LAC 33:XI.701.A.5-7 does not address specific RDD design criteria for UST piping, the Department has determined that the following requirements must be met to demonstrate compliance with LAC 33:XI.701.B.3:

1. External RDDs must consist of slotted (screened) piping installed within the piping trench to permit either the testing or monitoring of vapors in the soil or the testing or monitoring of liquids on or in the water table.
2. All RDDs must have a 4-inch inside diameter and be constructed of either polyvinyl chloride (PVC), polytetrafluoroethylene (PTFE), or stainless steel. They must be chemically compatible with the stored product. The screened interval must be commercially fabricated, slotted, or continuously wound. Screen size must be 0.01 inches. All connections of the casing and the screen must be by a threaded connector. No solvents, glues, epoxies, thermal processes, or rivets shall be used.
3. The screened interval must extend from 1 foot beneath the ground surface extending to the bottom of the entire piping trench.

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