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**OKLAHOMA CORPORATION COMMISSION**

**PETROLEUM STORAGE TANK DIVISION**

**(405) 521-4683 FAX: (405) 521-4945**

**Guidelines For The Use of Monitoring Wells**

**For Release Detection**

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| The Oklahoma Corporation Commission (OCC) allows underground storage tank (UST) owners to use monitoring wells as their method of release detection. The following is a summary of Federal and State rules that apply to groundwater and vapor monitoring wells. All requirements must be met no later than June 15, 2005. |

Monitoring for petroleum in the UST excavation by either groundwater or vapor monitoring is an effective means of detecting a release *if* performed properly and regularly. The key elements of a proper monitoring well release detection program are:

* The wells must be properly situated, installed and maintained;
* The monitoring equipment must be maintained *and calibrated* in accordance with the manufacturer’s instructions.

**OAC 165:25‑3‑6.23 Testing or monitoring for vapors**

**OAC 165:25-3-6.24 Testing or monitoring for liquids on the groundwater**

Before installing a new vapor or groundwater monitoring system or continuing to use an existing vapor or groundwater monitoring system for release detection, a site-specific site assessment must be conducted to determine all requirements are met:

1. A site map with the exact location and dimensions of the tank(s) and piping to determine an adequate number of wells have been installed and well placement. A topographic map should be included to demonstrate groundwater flow direction, or apparent gradient.
2. The material used as backfill is sufficiently porous (pea gravel, sand, crushed rock) to readily allow the diffusion of vapors from releases into the excavation zone.
3. The level of background contamination in the excavation area will not interfere with the method used to detect releases from the underground storage tank system. Vapor monitoring is **not** acceptable at a location where a previous release has occurred. Site remediation where contaminated soils have been excavated will be reviewed on a case-by-case basis. Groundwater monitoring is **not** acceptable where free product or dissolved phase may be present from a previous release.
4. The historical levels and current depth to groundwater at the site. If the water level rises above the bottom of the tanks because of a perched water table, fluctuating water table, or rainfall, vapor monitoring cannot be used. Dispersion of vapors would be restricted and a release could go undetected. If groundwater monitoring wells are used, the water level should never be more than 20 feet below ground surface, or the presence of product leaking from the tank may go undetected.
5. The stored regulated substance or a tracer compound placed in the tank system is sufficiently volatile to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank.
6. The regulated substance stored is immiscible in water and has a specific gravity of less than 1.0. All continuous monitoring devices or manual methods that are used are able to detect the presence of at least 1/8 inch of free product on top of the groundwater in the monitor wells.
7. Monitoring wells must be installed within the tank excavation and/or piping trench backfill.
8. Monitoring wells must be installed in accordance with OAC 785:35, Oklahoma Water Resources Board (OWRB) rules. Submission of well reports will serve as evidence of proper installation.
9. Monitor wells are clearly marked and secured to avoid unauthorized access and tampering.

In summary, the Federal UST program allowed testing for vapors as a release detection method “as long as certain conditions and limitations were met that maximize performance.” One of the conditions included that the soil be porous enough to allow the vapors to reach a monitoring well. This would include gravel, sand or crushed rock. Most native soils would not be porous enough to meet the limitations imposed by EPA. Consequently, unless a site assessment proved otherwise, a vapor monitoring well would only be effective within the tank pit and/or line trenches. Well construction is critical. The well(s) must be installed properly and in a manner that will not allow vapors to escape until the well cap is removed for testing. Proper installation of a monitoring well includes surface sealing/grouting to prevent entry of surface contaminants.

Another condition, which applies to **all** methods of release detection, is proper calibration, operation and maintenance of the testing equipment. The monitoring equipment must be properly maintained, must be capable of detecting 1/8 inch of free product on top of the groundwater in the well.

# Properly Installed

The wells must be constructed from two or four inch polyvinyl chloride (PVC) or stainless steel casing with factory milled well screen in accordance with OWRB rules. The well screen section should begin approximately two feet below ground surface (bgs) for tank excavations and one-foot bgs for piping trenches. The well screen must extend to a depth of two feet below tank bottom or piping. A filter pack of graded gravel or uncontaminated quartz sand, silica, or other material that will not affect groundwater quality must be placed around the entire length of the well screen. The area above the well screen must be sealed (annular seal) to prevent surface spills from contaminating the well, which would result in a false indication of a release. An anti-shrink concrete or grout seal must extend at least 12 inches from within the monitoring well manhole. The remainder of the well above the well screen must be sealed with a cement-bentonite mixture or bentonite pellets. A concrete or cement surface pad must be installed around the casing at the surface with minimum dimensions of 3 feet in diameter by 3.5 inches thick. The surface pad must be sloped to ensure that all surface water flows away from the well. The surface pad is not required if the well is completed in competent concrete or asphalt paving, and water does not drain into the well, or stand on top of the well. The wells must be installed within manholes competent to withstand anticipated traffic flow. The well casing must be secured with a tight fitting cap and the manhole cover bolted to prevent unauthorized tampering. The manhole cover must be clearly marked with an equilateral triangle to identify the well as a monitoring well or site assessment observation well.

**Sufficient Number of Wells**

**For Vapor Monitoring:**

A minimum of two wells is recommended for multi-tank excavations. Wells must be spaced to cover a maximum 20-foot radius. One well may be acceptable for single tanks of 3,000 gallons or less capacity, or for not more than (2) 2,000 gallon tanks in one excavation, provided the well is near the center of the excavation. In piping trenches, vapor wells must be placed at piping joints and where piping changes direction, spaced to cover a maximum 20-foot radius of influence. A well must also be placed at each dispenser island, in backfill material and in a location least likely to be impacted by a surface spill caused by vehicle overfilling.

**For Groundwater Monitoring:**

Two wells may be sufficient for single tanks of 3,000 gallons or less capacity, or for not more than (2) 2,000 gallon tanks in one excavation. For multiple tanks, a minimum of three wells must be installed, with at least one of the wells placed on the downgradient side. A sufficient number of wells must be installed so that the entire UST system is covered (20-foot radius does not apply). Groundwater monitoring on piping runs is not appropriate due to the depth to groundwater and the time required to detect a leak.

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| **NOTE: All monitoring wells must meet the requirements of the Oklahoma Water Resources Board, OAC 785:35*,* titled “Chapter 35, Well Driller and Pump Installer Licensing.”** |

**Reporting**

**OAC 165:25‑3‑7.1.** **Release reporting**

(a) The reporting requirements of this Part shall not relieve the owner or operator of the responsibility to take necessary corrective action pursuant to OAC 165:29, the Commission’s Rules on Corrective Action of Petroleum Storage Tank Releases, to protect public health, safety, and the environment, including the containment and cleanup of spills and overfills that are not required to be reported by this Chapter.

(b) All underground storage tank system owners, operators or their employees or agents, or transporters must report any of the following events to the PSTD by telephone at **(405) 521‑4683 or toll free at 1-888-621-5878 (if after hours or on weekends or holidays, call the PSTD emergency number at (405) 823-0994)** **within 24 hours of discovery**. Owners or operators must provide written confirmation to follow within 20 days in accordance with the requirements established in Commission rules.

(1) **The discovery of released regulated substances** at the facility or in the surrounding area (such as the presence of free product or vapors in soils, basements, crawlspaces, sewer and utility lines, and nearby surface water).

(2) **Any unusual operating conditions observed** such as the unexplained erratic behavior of product dispensing equipment; the sudden loss of product from the underground storage tank system; an unexplained presence of water in the tank; or liquid in the interstitial space of secondarily contained systems; unless system equipment or component is found not to be releasing regulated substances to the environment; any defective system equipment or component is immediately repaired or replaced; for secondarily contained systems any liquid in the interstitial space not used as part of the interstitial monitoring method (for example brine filled) is immediately removed.

(A) In the case of inventory control, two consecutive 30-day periods where total gallons over/short is greater than the "Leak Check" (1 percent of product sales plus 130 gallons) must be reported to PSTD within 24 hours of the owner/operator discovering the inventory control results.

(B) Any UST system failure from a third party-certified Statistical Inventory Reconciliation (SIR) analysis must be reported to PSTD within 24 hours of the owner/operator discovering the failure. An immediate investigation into the cause of the failed report must be conducted and results reported to PSTD within 7 days.

(C) An "Inconclusive" report from an SIR analysis report must be reported within 24 hours of the owner/operator discovering the report. An Inconclusive means that the UST system has failed to meet leak detection requirements for that 30-day period.

(3) An unusual level of vapors on the site that are of unknown origin. A vapor observation well reading in excess of 4,000 units/ppm from a pit containing gasoline tanks, and in excess of 1,500 units/ppm for a pit containing diesel or both gasoline and diesel, must be reported to PSTD within 24 hours of the owner/operator or any of his or her employees at the facility discovering the monitoring results. Within 10 days, the owner/operator must submit to PSTD all vapor monitoring well data for the last twelve (12) 30-day periods. Upon examination of the submitted data, PSTD will advise the owner/operator what action, if any, is needed.

(4) Any increase in vapor levels of 500 units/ppm above background or historical levels detected by 30-day monitoring, even though below the 24-hour reporting level, must be reported if the increase does not correct itself in the next 30-day period of monitoring and it must be reported to PSTD within 24 hours of the owner/operator, employees, or agents discovering the monitoring results.

(5) Monitoring results, including investigation of an alarm, from a release detection method required by this Chapter that indicate a release may have occurred unless:

(A) The monitoring device is found to be defective, and is immediately repaired, recalibrated, or replaced, and additional monitoring does not confirm the initial result.

(B) The leak is contained in the secondary containment and:

(i) Any liquid in the interstitial space not used as the interstitial monitoring method is immediately removed.

(ii) An defective system equipment or component is immediately repaired or replaced.

(C) The alarm was investigated and determined to be a non-release event (for example, from a power surge or caused by filling the tank during release detection testing.

(c) While aboveground releases of petroleum of less than 25 gallons need not be reported, they must be recorded by the owner/operator and contained and cleaned up immediately. All of the following releases must be reported to PSTD by telephone within 24 hours of discovery, with a written confirmation to PSTD within 20 days in accordance with the requirements established in this Chapter:

(1) All known belowground releases in any quantity; for example, a release resulting from a line broken during an excavation.

(2) Any aboveground release of petroleum greater than 25 gallons.

(3) Any aboveground release of petroleum which is less than 25 gallons, but cannot be contained and cleaned up within 24 hours.

(d) All owners/operators of underground storage tank systems must maintain records of all reportable and nonreportable events listed in this section sufficient to permit adequate inspection and review by PSTD. These records must be kept for three (3) years following the date of the event.

(e) If any of the possible, probable or definite release conditions above are not reported within 24 hours, the owner/operator must be prepared to provide documentation or evidence that would reasonable indicate why knowledge of the release conditions or monitoring results was delayed,

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| **The OCC considers a vapor level of 1,500 parts-per-million of diesel to be an unusual level and requires that it be reported within 24 hours. If diesel and gasoline USTs are located in the same tank excavation, the reportable vapor level for that excavation is 1,500 parts-per-million.** |

**Summary**

Before installing a new vapor or groundwater monitoring system, or continuing to use an existing vapor or groundwater monitoring system for release detection, a site-specific site assessment must be conducted by a PSTD Licensed Environmental Consultant. A copy of the site assessment must be maintained at the facility and readily available to the PSTD Fuel Specialist when he is at the facility for an inspection.

All vapor and groundwater monitoring systems must be sampled, tested, or checked for a release at least once every 30 days by a PSTD Licensed Observation Well Technician. A copy of the results must be maintained at the facility and readily available to the PSTD Fuel Specialist when he is at the facility for an inspection.

All leak detection records, including but not limited to, sampling, testing, inventory and monitoring records must be available on site for each tank for the preceding three (3) years. These records must show the date of each test, who performed the test, the type instrument used, the last date of calibration, and the test results of each well. All vapor readings must be recorded in parts-per-million on the OCC approved form available on PSTD's website.

Vapor monitoring well readings above 4,000 units/ppm for gasoline and above 1,500 units/ppm for diesel, or above 1,500 units/ppm for a tank pit containing both gasoline and diesel tanks, must be reported to PSTD within 24 hours of owners, operators, employees, or agents knowing of the reading. An increase in vapor levels above 500 units/ppm above background or historical levels detected by 30 day monitoring, even though below the 24-hour reporting level, must be reported within 24 hours if the increase does not correct itself in the next 30-day monitoring period.

Any indication of free product floating on the water table must be reported to PSTD within 24 hours of owners, operators, employees, or agents discovering the product. If a monitoring report is not made within 24 hours, the owner or operator must be prepared to show documentation or evidence that would reasonable indicate why knowledge of the existence of free product was delayed.

The phone number to report a release or suspected release to PSTD is (405) 521-4683 or toll free at 1-888-621-5878 (if after hours or on weekends or holidays, call the PSTD emergency number at (405) 823-0994) within 24 hours of discovery.

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