**Section 175.630 Methods of and Requirements for Release Detection for Tanks**

Owners and operators of petroleum USTs shall provide release detection on tanks. Only one approved method of primary release detection is required for each tank although multiple methods are acceptable. If present, secondary release detection systems must be maintained. No method of release detection shall be used unless that method has been approved by OSFM. USTs must be monitored at least every 30 days for releases using one or more of the methods listed below:

a) Manual Tank Gauging

1) Only tanks of 600 gallons or less nominal capacity may use the method described in this subsection (a). All owners or operators using manual tank gauging methods must conduct a monthly reconciliation and maintain those reconciliation records. The requirements for this type of release detection shall adhere to requirements listed in this subsection for the specific tank sizes noted:

**Requirements**

|  |  |  |
| --- | --- | --- |
| **Nominal tank capacity** | **Whether use of manual tank gauging for release detection is allowed** | **Time limit on use of manual tank gauging for release detection** |
| 600 gallons or less | Allowed as sole method of release detection | Allowed indefinitely |
| 601-2,000 gallons | Not allowed | Not allowed |
| Over 2,000 gallons | Not allowed | Not allowed |

2) Standards

A) In order to be eligible to continue to use manual tank gauging alone (tanks 600 gallons or less only), the following standards regarding maximum variation between beginning and ending product level measurements shall be adhered to:

**Standards**

|  |  |  |
| --- | --- | --- |
| **Nominal tank capacity** | **Weekly standard**  **(one test)** | **Monthly standard**  **(average of 4 tests taken once weekly over a 4-week period)** |
| 600 gallons or less | 10 gallons | 5 gallons |

B) A leak is suspected and subject to the requirements of 41 Ill. Adm. Code 176.300 through 176.360 if the variation between beginning and ending measurements exceeds the weekly or monthly standards as listed in this subsection (a). Weekly inventory records, monthly reconciliation records, and related records shall be maintained for 2 years in order to continue to be eligible to continue to use manual tank gauging.

3) Manual tank gauging shall also meet the following requirements:

A) Tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;

B) Level measurements are based on an average of 2 consecutive stick readings at both the beginning and ending of the period;

C) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest ⅛ inch;

D) The measurement of any water level in the bottom of the tank is made to the nearest ⅛ inch at least once a month; and

E) All personnel involved in performing manual tank gauging measurements, recordkeeping and related performance must be knowledgeable in that performance and activities.

4) Manual tank gauging cannot be used as a method of release detection for any tank that, after passing only a noninvasive tank integrity assessment, was upgraded using the cathodic protection method.

b) In conjunction with Statistical Inventory Reconciliation (SIR) and any other release detection methods when required, tank precision testing, as approved by OSFM (not a stand-alone method of release detection):

1) Tank precision testing (or another test of equivalent performance) shall be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table. There are 4 types of tank precision testing:

A) 100% volumetric overfill;

B) Volumetric underfill with an approved ullage test of negative pressure or inert gas as approved by OSFM;

C) A negative pressure; or

D) Other approved methods, in accordance with subsection (h).

2) In the case of a suspected release, tracer elements and automatic tank gauging (ATG) are not approved methods of tank precision testing.

c) Automatic Tank Gauging (use of an ATG). ATG equipment that tests for the loss of product and conducts inventory control shall meet the following requirements:

1) The automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product;

2) The ATG must also meet or exceed the performance criteria and requirements found at 40 CFR 280.43(a) and the test must be performed with the system operating in one of the following modes:

A) In-tank static testing conducted at least once every 30 days; or

B) Continuous in-tank leak detection operating on an uninterrupted basis or operating within a process that allows the system to gather incremental measurements to determine the leak status of the tank at least once every 30 days.

3) The ATG must be installed, calibrated and in compliance with the protocol of the third party evaluation;

4) Beginning May 1, 2003, all new or replacement ATG monitors shall be mounted no more than 6 feet from the floor and must remain unobstructed and accessible;

5) All ATG systems must be equipped with printers. If a system has to be retrofitted, a permit will be required. Systems with remote printers will be accepted.

d) Vapor Monitoring. Testing or monitoring for vapors within the soil gas of the excavation zone shall meet the following requirements:

1) The materials used as a backfill are sufficiently porous (e.g., gravel, sand or crushed rock) to readily allow diffusion of vapor from releases into the excavation area;

2) The stored regulated substance or a tracer compound placed in the tank system is sufficiently volatile (e.g., gasoline) 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;

3) The measurement of vapors by the monitoring device is not rendered inoperative by groundwater, rainfall, soil moisture or other known interferences so that a release could go undetected for more than 30 days;

4) The level of background contamination in the excavation zone will not interfere with the method used to detect releases from the tank;

5) The vapor monitors are designed and operated to detect any significant increase in concentration above the 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; vapor monitor sensors must be permanently installed in the vapor monitor wells; a monthly inspection of the vapor monitoring system must be made and a log maintained showing the date of inspection, results and initials of the party doing the inspection; all vapor sensors must be tested for functionality by a licensed contractor pursuant to Section 175.610(a)(4) at least once every 3 years and the records kept until the next test;

6) In the UST excavation zone, the site is assessed to ensure compliance with the requirements in subsections (d)(1) through (4) 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. In the event of a confirmed release, this method of release detection may not be used until remediation is complete and a new site assessment is conducted that demonstrates that the vapor monitoring system will meet all criteria, including documentation on the threshold for a release and documentation that background contamination will not interfere with the ability to detect a release. If replacement of the UST system triggers the requirement for double-walled tanks and piping, interstitial monitoring is required. If the owner/operator wishes to combine this form of release detection with groundwater monitoring during seasonal variations, the site assessment must clearly document that use;

7) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering;

8) Vapor monitoring wells shall be of sufficient design to allow vapors to be detected from any portion of the tank being monitored and shall be a minimum of 4 inches in diameter or as approved by OSFM on the applicable permit;

9) An adequate number of vapor monitoring wells shall be provided to ensure that a release can be detected from any portion of the tank. Adequacy of the wells is subject to approval of OSFM on the applicable permit; and

10) Phase out and elimination of vapor monitoring. Except pursuant to Subpart I, no permits for installation of vapor monitoring systems will be issued after October 13, 2018. Except pursuant to Subpart I, this method will no longer be allowed for tanks after October 13, 2023.

e) Groundwater Monitoring. Testing or monitoring for liquids on the groundwater shall meet the following requirements:

1) The regulated substance stored is immiscible in water and has a specific gravity of less than one;

2) Groundwater is never more than 20 feet from the ground surface, the hydraulic conductivity of the soil between the UST and the monitoring wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravels, coarse to medium sands, coarse silts or other permeable materials), and groundwater shall be present in the groundwater monitoring wells at all times;

3) The slotted or perforated portion of the monitoring well casing shall be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low groundwater conditions;

4) Groundwater monitoring wells shall be sealed from the ground surface to the top of the filter pack;

5) Monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible;

6) The continuous monitoring devices or manual methods used can detect the presence of at least ⅛ inch of free product on top of the groundwater in the monitoring wells.

A) The continuous monitoring devices must be fixed sensors mounted permanently inside the well or samples must be taken by a mechanical bailer capable of detecting the presence of at least ⅛ inch of free product on top of the groundwater in the monitoring wells.

B) Groundwater monitoring must be done monthly and a log of the inspection made showing the date of the inspection, initials of the person conducting the inspection, and results of the well sampling;

7) Within and immediately below the UST excavation zone, the site is assessed to ensure compliance with the requirements in subsections (e)(1) through (5) and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely contains product. In the event of a confirmed release, this method of release detection may not be used until remediation is complete and a new site assessment is conducted that demonstrates that the groundwater monitoring system will meet all criteria, including documentation on the threshold for a release and documentation that background contamination will not interfere with the ability to detect a release. If replacement of the UST system triggers the requirement for double-walled tanks and piping, interstitial monitoring is required. If the owner/operator wishes to combine this form of release detection with vapor monitoring during seasonal variations, the site assessment must clearly document that use;

8) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering;

9) As of September 1, 2010, the minimum diameter of newly installed groundwater monitoring wells shall be 8 inches;

10) An adequate number of groundwater monitoring wells shall be provided to ensure that a release can be detected from any portion of the tank based upon the direction of groundwater flow and the tank placement. Adequacy of the wells is subject to approval of OSFM on the applicable permit. Beginning May 1, 2003, an adequate number of monitoring wells shall require a minimum of two 8-inch diameter monitoring wells for the first tank and one additional well for each additional tank installed. The wells will be of manufactured slotted or perforated type. They shall be at opposite ends and corners, one foot below the invert elevations of the lowest UST; and

11) Phase out and elimination of groundwater monitoring. Except pursuant to Subpart I, no permits for installation of groundwater monitoring leak detection systems shall be issued after October 13, 2018. Except pursuant to Subpart I, this method will no longer be allowed for tanks after October 13, 2023.

f) Interstitial Monitoring. Interstitial monitoring between the UST and a secondary barrier immediately around or beneath it, or interstitial monitoring as required by Sections 175.400(a) and 175.420(b) and meeting the requirements of this Section, may be used but only if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product. All tanks permitted on or after February 1, 2008 must be equipped with interstitial monitoring sensors. When required to make tank or piping interstitial monitoring functional, the appropriate containment (e.g., under-dispenser containment, tank containment sumps or junction sumps) shall be installed. All existing interstitial monitoring systems and sensors shall be maintained and, beginning September 8, 2008, may not be removed irrespective of whether the leak detection is secondary or redundant to other forms of leak detection. If the interstitial monitoring is not functional or not operating properly it shall promptly be repaired or replaced and any necessary measures to prevent false positive and false negative readings shall be implemented.

1) Interstitial monitoring must also meet one of the following requirements:

A) For double-wall USTs, the sampling or testing method can detect a release through the inner wall in any portion of the tank that routinely contains product;

B) For USTs existing prior to February 1, 2008 and with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the underground storage tank system and the secondary barrier.

i) The secondary barrier around or beneath the UST consists of artificially constructed material that is sufficiently thick and impermeable (at least 0.000001 cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection;

ii) The barrier is compatible with the regulated substance stored so that a release from the UST will not cause a deterioration of the barrier allowing a release to pass through undetected;

iii) For cathodically protected tanks, the secondary barrier shall be installed so that it does not interfere with the proper operation of the cathodic protection system;

iv) The groundwater, soil moisture or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days;

v) The site is assessed to ensure that the secondary barrier is always above the groundwater and not in a 25-year flood plain unless the barrier and monitoring designs are for use under those conditions;

vi) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering; and

vii) An adequate number of monitoring wells shall be provided to ensure that a release can be detected from any portion of the tank. Adequacy of the number of the wells is subject to the approval of OSFM.

C) For tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

2) The interstitial monitoring system must be tested every year pursuant to Section 175.610(a)(4) to verify its operation and records from the 2 previous tests must be kept on site, or available within 30 minutes or before OSFM completes its inspection, whichever is later. Testing of the system sensors shall be done in such a way as to verify their function but not damage the sensors. This testing shall be done by a licensed contractor. Interstitial monitoring must also comply with the requirements of Section 175.640.

3) The operability of the interstitial monitoring sensors shall be inspected and verified by the owner/operator every 30 days. Pursuant to Section 175.650(e), records for the previous 2 years must be kept on site or available within 30 minutes or before OSFM completes its inspection, whichever is later.

g) Statistical Inventory Reconciliation

1) Release detection methods based on the application of statistical principles to inventory data must meet the following requirements:

A) Report a quantitative result with a calculated leak rate;

B) Be capable of detecting a leak rate of 0.2 gallon per hour or a release of 150 gallons within 30 days; and

C) Use a threshold that does not exceed one-half the minimum detectible leak rate.

2) The company that uses this method shall provide OSFM a written affirmation that their data collection staff is trained in the data gathering procedures and that only trained staff will be utilized for data collection. Each tank monitored by SIR shall be identified to OSFM in writing within 30 days after the commencement of the monitoring, specifying tank size, product stored, facility location and any other pertinent identification information necessary. SIR data shall be compiled and analyzed once each month to determine if a release has occurred, and the results put into a monthly report that is maintained by the facility.

3) SIR methods may only be used in conjunction with tank precision testing conducted annually, starting with the time that SIR is first used. An additional tank precision test pursuant to subsection (b) shall be mandatory if any data analysis indicates a possible release or is inconclusive or indeterminate, or for any test result other than a pass, or when a report is not available for any month of monitoring.

4) The measurement of any water level in the bottom of the tank is made to the nearest ⅛ inch at least once a month.

5) New requests to use SIR after May 1, 2003 will no longer be accepted. If SIR is discontinued on a UST, SIR will not be allowed again.

6) After January 1, 2006, SIR may not be used on systems with blending pumps or siphon tanks.

h) Other Methods. Any other type of release detection method or combination of methods, approved by OSFM, may be used if the owner or operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in subsections (b) through (f). Demonstration of any such method shall be in writing submitted to OSFM. In comparing methods, OSFM shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner or operator shall comply with any conditions imposed by OSFM on its use to ensure the protection of human health or the environment. Before the utilization of the method, OSFM shall issue written approval.

i) One copy of each independent third-party evaluation and its protocol, for the release detection methods in subsections (b), (c), (d), (f), (g), and (h), shall be submitted to OSFM as part of the permit application process. Any deviation from the third-party evaluation shall be submitted to OSFM for approval with the permit application, including, but not limited to, an evaluation by a licensed professional engineer finding that the release detection system as installed meets the performance requirements of 40 CFR 280 and this Part and the performance claims established by the independent third party evaluation and its protocol. For requirements regarding listing of components used with alternative or blended fuels, see Section 175.415.

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