MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF LAND PROTECTION AND REVITALIZATION
OFFICE OF SPILL RESPONSE AND REMEDIATION

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SUBJECT: (Guidance Memo No. #LPR-SRR-2020-01 – **New Underground Storage Tank (UST) Requirements Effective January 1, 2021**)

TO: Petroleum Program Managers

FROM: Jeffery Steers
Director of Operations

DATE: May 20, 2020

COPIES: Regional Directors, Deputy Regional Directors, Elizabeth Lamp, Renee Hooper, Alicia Meadows, Russell Ellison, Lisa Dewey

Summary:
This guidance provides DEQ staff and the other stakeholders with the implementation policies for the regulatory requirements that must be completed by January 1, 2021 for the underground storage tank regulations that became effective on January 1, 2018. A separate guidance document was created for the regulatory requirements that became effective on January 1, 2018. This guidance will be incorporated into Volume III of the Storage Tank Program Compliance Manual.

Electronic Copy:
Once effective, an electronic copy of this guidance will be available on:

- The Virginia Regulatory Town Hall under the Department of Environmental Quality(http://www.townhall.virginia.gov/L/gdocs.cfm?agencynumber=440);
- The Department's website at http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/Laws,Regulations,Guidance.aspx

Contact information:
Please contact Alicia Meadows at (540) 562-6729 or Alicia.Meadows@deq.virginia.gov with any questions regarding the application of this guidance.

Certification:
As required by Subsection B of § 2.2-4002.1 of the Administrative Process Act (APA,) the agency certifies that this guidance document conforms to the definition of a guidance document in § 2.2-4101 of the Code of Virginia.

Disclaimer:
This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any alternative method. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NEW UNDERGROUND STORAGE TANK (UST) REQUIREMENTS EFFECTIVE JANUARY 1, 2021

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1 Background

The revised federal Underground Storage Tank (UST) regulations became effective on October 13, 2015. The 1988 UST regulation required owners and operators to have spill, overfill, corrosion protection and release detection equipment in place for their UST systems, but did not require proper operation and maintenance for some of that equipment. The 2015 federal revisions emphasize the proper operation and maintenance of critical UST equipment. The revisions also acknowledge improvements in technology over the last 25 years, including the ability to detect releases from UST systems deferred in the 1988 UST regulation. In order to maintain EPA program delegation, Virginia has revised its UST regulation to conform to the federal regulations.

Changes to Virginia's UST Technical and Financial Responsibility regulations became effective on January 1, 2018. **Tank owners/operators must comply with some new regulatory requirements as of January 1, 2018, but will have until January 1, 2021 to demonstrate compliance with the remaining requirements.**

1.1 Purpose

This guidance discusses the new regulatory requirements contained in 9VAC25-580 *et seq.* (Regulation) that tank owners/operators must comply with as of January 1, 2021. **Guidance regarding requirements that became effective January 1, 2018 is provided in a separate document that may be found here on DEQ's website: https://www.deq.virginia.gov/Programs/LandProtectionRevitalization/PetroleumProgram/GuidanceRegulations.aspx .**

2 Release Detection

2.1 Emergency Generator Tanks

All emergency generator tanks will be required to perform tank and piping release detection by January 1, 2021. Those installed on or after September 15, 2010 have been required to perform interstitial monitoring (secondary containment) release detection since installation. The release detection options for emergency generator tanks installed before September 15, 2010 include all the options used for other USTs, with the possible exception of statistical inventory reconciliation (SIR). SIR may not be an option for emergency generator tanks that are not equipped with a meter to measure the amount of fuel taken out of the tank. Release detection options are discussed in detail in Volume 3 of the Storage Tank Program Compliance Manual: Underground Storage Tank Inspections (https://www.deq.virginia.gov/Portals/0/DEQ/Land/Tanks/LPR-SRR-2016-3_compliancemanual_Vol3.pdf).

Tank release detection typically will not be difficult for emergency generator tanks, however, piping release detection may be problematic for some existing piping set ups. Typically, emergency generator systems have piping that runs from the UST to an aboveground day tank and return piping from the day tank to the UST. The piping types associated with emergency generator tanks are safe suction, unsafe suction, pressurized/gravity, or a combination of the types. Issues pertaining to specific piping types are discussed in the following sections.

2.1.1 Piping from the UST to the day tank

Underground piping from the UST to the day tank may be suction or pressurized piping. All pressurized piping requires an automatic line leak detector (ALLD) and one other method of release detection. There are two different types of ALLDs: mechanical and electronic.

- Mechanical ALLDs typically meet the regulatory requirements by restricting the flow of product when there is a pressure change within the pipe.

- Electronic ALLDs monitor piping pressure decay and may shut down the submersible sump turbine (STP) and trigger visual alarms via an automatic tank gauge (ATG) or dedicated console.

- Sump sensors may also be used to meet the ALLD regulatory requirement. Sump sensors either trigger a visual alarm or shut down the STP via an ATG.

Mechanical line leak detectors (mALLDs) are usually not a good option for piping release detection for an emergency generator UST system because they usually do not function properly with the typical system set up. Mechanical line leak detectors also restrict or shut off flow from the tank. Shutting off the flow of fuel from the tank is not ideal in an emergency situation because the generator may not receive enough fuel to generate power.

Electronic line leak detectors (eALLDs) may not work on many set ups because the product constantly applies pressure to the eALLD, which prevents the ALLD from properly determining the pressure in the line. If too much pressure remains on the eALLD, then it will continually stay in alarm mode. In order to use an electronic line leak detector, piping modifications may be needed.

In addition, in order to perform a precision tightness test on a supply line, a tank owner/operator may need to install a mechanical locking ball valve at the point the underground piping emerges above ground or enters a building (aboveground piping does not need to be monitored). The locking ball valve should stay locked in the open position unless a tightness test is being performed. If an eALLD is used, the tank owner/operator may wish to set up the eALLD to alarm when a leak is discovered in lieu of positive pump shutdown to avoid shutting down the generator in an emergency.

Double-walled piping and interstitial monitoring with a sump sensor is usually a better option to meet both pressurized and unsafe/American suction piping release detection requirements. DEQ will consider any practical designs to meet the automatic line leak detector requirement, but the tank owner/operator is responsible for demonstrating to DEQ that the method and configuration used complies with the requirements of the Regulation.

NOTE: Hospitals and other emergency facilities should use caution when using mechanical line leak detectors because they will restrict or shut off the fuel to the generator if they are triggered. Electronic line leak detectors without positive shut off or sump sensors with double-walled piping may be more suitable options.

2.1.2 Return piping from the day tank to the UST

Return piping is considered pressurized piping due to the head pressure of the fuel. Conventional piping release detection is difficult to achieve on many single walled return lines. Double-walled lines with sump sensors are the best option for piping release detection, but some single walled return lines still exist. **Automatic line leak detectors will not be required on return lines because there is not a practical solution to**

ensure the leak detector functions properly and the return line prevents an overfill of the day tank. Corrosion protection for lines in contact with the ground and one method of piping release detection (monthly or annual line testing) will be required for return lines. A line tightness test must be conducted annually for single-walled piping whereas monthly interstitial monitoring may be used for double-walled piping.

Table 1 - Emergency Generator UST Piping Testing Options

Emergency Generator UST Piping Testing Options	
Piping Type	**Allowable Test Method**
Pressurized piping from UST to Day Tank	1. ALLD required 2. Double-walled piping - Interstitial monitoring with sump sensor 3. Single walled piping - locking ball/isolation valve is needed to perform annual line tightness test unless another method of release detection is used
Piping from Day Tank to UST (Return line)	1. ALLD not required 2. Double-walled piping – interstitial monitoring with sump sensor 3. Single walled piping – locking ball/isolation valve is needed to perform annual line tightness test unless another method of release detection is used

2.2 Release Detection Equipment Testing

All release detection equipment will need to be tested for proper operation by January 1, 2021 and annually thereafter unless a tank is temporarily closed and empty (less than one inch of product) (see 9VAC25-580-130.A.3). Release detection equipment should be tested prior to bringing a temporarily closed tank back into use. The operational tests must be conducted following the manufacturer's instructions or an industry standard such as the Petroleum Equipment Institute's Publication RP1200 (PEI RP1200) "Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities."

Facilities using multiple methods of release detection may choose to test only the equipment associated with the method of release detection used to comply with release detection requirements. However, the DEQ inspector will only review the release detection records for the equipment that has been properly tested. This means that the tank owner/operator may not use an alternative release detection method to demonstrate compliance unless the equipment associated with the alternative method has been tested in accordance with the Regulation. Testing equipment associated with multiple methods of release detection may increase the likelihood of full compliance upon inspection.

2.2.1 Testing criteria

The equipment testing must include the following components and criteria:

- **Automatic Tank Gauge Consoles**
  - Test audible and visual alarms
  - Verify system set up
  - Test battery back up
- **Probes and Sensors**
  - Inspect for residual buildup
  - Ensure floats move freely
  - Ensure shaft is not damaged
  - Ensure cables are free of kinks and breaks
  - Ensure alarms operate properly and communicate with the console

- **Automatic Line Leak Detectors**
  - **A leak must be simulated for testing**
  - Ensure leak detector can detect a three gallon per hour leak at 10 psi within one hour
  - **Self-tests of electronic line leak detectors will no longer be accepted**
  - **A simulated leak test will be required for both mechanical and electronic line leak detectors**
  - The alarm system and positive shutdown system must be tested for electronic line leak detectors at unmanned facilities. If the alarm system remotely alerts operators, then that system must also be tested.

- **Vacuum pumps and pressure gauges**
  - Ensure proper communication with sensors and controller

- **Groundwater and Vapor Monitoring hand-held equipment**
  - Ensure proper operation

2.3 Release Detection Equipment Testing Recordkeeping

- Site Assessments for groundwater or vapor monitoring must be kept for as long as the method is used.

- Annual operation tests must be kept for at least three years.

- Test records should clearly indicate that the items listed in Section 2.2.1 were checked and the equipment passed the check.

2.4 Electronic Automatic Line Leak Detectors (eALLDs)

The Regulation requires automatic line leak detectors (ALLDs) to "alert the operator to the presence of a release." Typically, an electronic automatic line leak detector (eALLD) only sends an alarm to a console and does not shut off pumps. Product can continually leak from a product line until the pump is shut off. Significant environmental impact can occur at an unmanned facility if a piping leak occurred and no one is

present to shut off the pumps. (A facility is considered "unmanned" if there is not an operator on-site during all operating hours and there is no way to notify an operator for an immediate response.) **Therefore, electronic or sump sensor ALLDs must trigger positive pump shutdown at unmanned facilities.** Positive pump shutdown is accomplished via an automatic tank gauging (ATG) system. Dispenser shut off buttons located at the cash register are not adequate to completely shut down the pumps. An automated system that notifies an operator via mobile phone or other device in the event of a leak may be used in lieu of positive shutdown if the operator can respond immediately to address the problem. Immediate response requires the operator to shut off the system within one hour. If this option is used, the tank owner/operator will be responsible for demonstrating to DEQ that the notification system complies with the requirements.

Note: Mechanical ALLDs remain acceptable at unmanned locations since they restrict flow to ~1gpm and would thus alert the dispenser operator to the slow flow and thus potential line leak.

3 Equipment Testing

By January 1, 2021 and every three years thereafter, integrity testing must be conducted on all spill buckets, overfill prevention devices, and single-walled containment sumps and under-dispenser containment (UDC) used for interstitial monitoring. **Equipment associated with empty temporarily out of use tanks does not need to be tested**. However, all equipment should be tested prior to bringing the temporarily out of use tank(s) back into use. All testing must be conducted in accordance with the manufacturer's requirements, PEI RP 1200 or other industry standard, or by a DEQ approved method. In lieu of tightness testing, owners/operators may interstitially monitor double-walled spill buckets, containment sumps, and/or UDCs every 30 days. Testing methodologies are discussed in the following sections.

3.1 Spill Prevention Testing

All single-walled spill prevention devices around fill pipes (including remote fills) must be tightness tested by January 1, 2021 and every three years thereafter unless the spill prevention device was installed on or after January 1, 2018, in which case the device should have been tested at installation. Following the installation test, the spill prevention device must also be tested every three years thereafter. Double-walled spill prevention devices may be properly monitored every 30 days in lieu of tightness testing (see Section 3.1.2).

- Spill prevention devices around equipment such as automatic tank gauge and vapor recovery risers do not need to be tested.

- Spill prevention devices that also serve as secondary containment sumps for piping will need to be tested in accordance with Section 3.3 of this document.

- Tank owners/operators of unconventional spill prevention devices, such as open berm containment areas, will need to propose testing protocols to DEQ for approval. DEQ Central Office (CO) staff will issue approvals or disapprovals for unconventional equipment.

3.1.1 Testing Requirements

- Spill prevention devices must be tested using vacuum, pressure, vapor or liquid (hydrostatic) testing.

- The test must occur prior to January 1, 2021 or at the time of installation and every three years thereafter.

- The test must be conducted in accordance with the manufacturer's requirements, an industry standard such as PEI RP 1200, or a method approved by DEQ.

Table 1 Spill Prevention Testing Requirements

TESTING REQUIREMENTS FOR SPILL PREVENTION DEVICES	
Type of Device	**Testing Requirement**
Around fill pipes (including remote fills)	New - At time of installation Existing - By 1/1/2021 and every three years thereafter
Device also serves as secondary containment for piping	New – At time of installation Existing - By 1/1/2021 and every three years thereafter
Unconventional equipment	New – At time of installation Existing - By 1/1/2021 and every three years thereafter Test method must be approved by DEQ
Double-walled	May monitor every 30 days or at each delivery, in lieu of testing every three years
At ATGs and vapor recovery risers	Testing not required
Empty temporarily closed tank	Testing not required unless tank is brought back into use

3.1.2 Double-Walled Spill Prevention Devices

Owners/operators who install double-walled spill buckets may choose to begin monitoring the interstitial space every 30 days or at the time of each delivery (whichever is greater) to preempt the need to do a tightness test every three years.

Note: If deliveries occur at intervals greater than every 30 days, double walled spill buckets can be interstitially monitored prior to each delivery instead of every 30 days.

- The integrity of both the inner and outer wall must be monitored by pressure, vacuum, or a sensor.

- A dry interstice is not permitted because it does not always allow monitoring of the outer wall. An interstice monitored by a sensor only, must contain brine solution.

- Within 30 days of discontinuing interstitial monitoring of double-walled spill buckets, a tightness test must be conducted.

- Interstitial monitoring records must be kept for as long as the equipment is periodically monitored.

3.1.3 Test Report Requirements

Testing contractors may use industry developed test forms (PEI RP 1200) or develop their own test forms. At a minimum, the testing form must include the following information:

- Facility name and address
- Date of test
- Testing company name, address and phone number
- Tester Name
- Item tested
- Test method
- Which tanks each spill prevention device is associated with and the tank capacity
- Test results (pass or fail)
- Start and Stop time for test, and
- Liquid, vacuum, or pressure level at beginning and end.

3.1.4 Failed Test Results

Spill prevention device test failures on their own will not be considered suspected releases. Likewise, a spill device closure assessment with soil samples is not required. However, if there is clear evidence of contamination such as stained soils or the presence of strong vapors, a confirmed release should be reported to DEQ within 24 hours. A case manager will be assigned to the pollution complaint, and soil samples will likely be required in cases where there is clear evidence of contamination.

3.1.5 Repairs

When a spill prevention device fails a tightness test, it must be repaired, or closed and replaced. Repair requirements are discussed in Section 4.3.

3.2 Overfill Prevention Devices

All overfill prevention devices around fill pipes (including remote fills) must be integrity tested by January 1, 2021 unless the device was installed on or after January 1, 2018, in which case the device should have been tested at installation and every three years thereafter.

3.2.1 Testing Requirements

- The test must occur prior to January 1, 2021 or at the time of installation and every three years thereafter.

- The test must be conducted in accordance with the manufacturer's requirements, an industry standard such as PEI RP 1200, or a method approved by DEQ.

- The test must verify that the overfill device will:

    a. Automatically shut off the flow into the tank when the tank is no more than 95% full;
    b. Alert the transfer operator when the tank is no more than 90% full by restricting the flow into the tank or triggering a high-level alarm; or
    c. Restrict the flow 30 minutes prior to overfilling, alert the transfer operator with a high level alarm one minute before overfilling, or automatically shut off flow into the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

- **If the UST system is equipped with two or more overfill devices, then both devices need to be tested to ensure that the design and installation of both devices will not conflict.** When multiple overfill devices are used, they may conflict with each other. For example, a high level alarm may be set to

alert an operator at 93%, whereas a shutoff valve may be set incorrectly at 98%. If the high level alarm is not tested and fails, it could cause the product to reach 98% before the shutoff valve activates. If the shutoff valve does not activate until the tank is 98% full, an overfill of the tank is likely because the driver will not have time to shutoff the delivery. Therefore, both devices will need to be tested for functionality and to ensure that both devices are functional and neither device will hinder the other.

- Existing ball float valves (new installations are prohibited) should not be used in conjunction with: suction piping, pumped delivery, coaxial Stage I vapor recovery, remote fill pipes with gauge openings, or when shutoff valves are used for overfill. Ball float valves used in conjunction with any of the aforementioned equipment should fail integrity tests.

  Note: The entire ball float assembly (including the ball float pipe in the tank) must be removed from the UST if a shutoff device is present.

- The Regulation does not require removal of the overfill device for inspection; however, if the manufacturer or testing standard requires removal, then the overfill device must be removed before inspecting. Some manufacturers have developed overfill devices and inspection tools that may not require removal of the device for testing after installation. DEQ staff will verify test records for correct methodology and frequency at the time of the facility inspection.

Table 2 Testing Requirements for Overfill Prevention Devices

TESTING REQUIREMENTS FOR OVERFILL PREVENTION DEVICES	
Type of Device	**Testing Requirement**
Ball Float Valve	**New installations are prohibited** Existing - By 1/1/2021 and every three years thereafter
Shutoff Valve	New – At time of installation Existing - By 1/1/2021 and every three years thereafter
Alarm	New – At time of installation Existing - By 1/1/2021 and every three years thereafter
Multiple Devices	Both devices must be tested New- At time of installation Existing – By 1/1/2021 and every three years thereafter
Empty temporarily closed tank	Testing not required unless tank is brought back into use

3.2.2 Test Report Requirements

Testing contractors may use industry developed test forms (PEI RP 1200) or develop their own test forms. At a minimum, the testing form must include the following information:

- Facility name and address
- Date of test
- Testing company name, address and phone number
- Tester Name
- Item tested
- Test method

- Which tank each overfill prevention device is associated with and the tank capacity
- Test results (pass or fail)
- Measurements and calculations, and
- Test criteria.

3.2.3 Failed Test Results

When an overfill prevention device fails an integrity test, it must be repaired or replaced. **Overfill devices cannot be replaced with ball float valves.**

If an overfill device is removed and replaced with a different type of overfill device, tank owners/operators must notify DEQ of the change using Virginia's Notification for Underground Storage Tanks Form 7530-3.

Existing ball float valves may continue to be used in conjunction with another primary overfill prevention device as long as the ball float does not interfere with the operation of the overfill prevention equipment being used as the compliant device. Ball floats should not be used with shutoff valves since the ball float valve will interfere with the shutoff valve.

3.2.4 Repairs

Repairs should be conducted as soon as practicable, but no longer than 30 days following a failed test result or discovery of a faulty system component or documentation should be provided to DEQ demonstrating that steps are being taken for a timely repair. Repair requirements are discussed in Section 4.3.

Ball float valves may only be repaired if they are not set to the correct height in the tank. Replacing major components of the ball float valve equates to replacing the ball float valve which is not permitted by the Regulation. If the ball float valve fails the integrity test (except for proper placement in the tank), it must be replaced with another type of overfill device. The repaired device must also be immediately tested for correct height following the repair to ensure the integrity of the repaired component. Repair records must be kept for the life of the system.

3.3 Sump and Under-dispenser Containment (UDC) Testing

A containment sump is a liquid-tight container that protects the environment by containing leaks and spills of regulated substances from piping, dispensers, pumps and related components in the containment area. Containment sumps may be single walled or double walled. They may be located at the tank top surrounding the submersible turbine pump (STP), underneath the dispenser (under-dispenser containment (UDC) sump), or at other points in the piping run (transition or intermediate sump).

Containment sumps used for interstitial monitoring installed on or after January 1, 2018 must be tightness tested at the time of installation and every three years thereafter unless the tanks are temporarily closed and empty. **All other containment sumps used for interstitial monitoring must be tightness tested prior to January 1, 2021 and every three years thereafter.** Containment sumps that were installed prior to September 15, 2010 that are <u>not</u> used for interstitial monitoring do not need to be tested every three years.

As noted above, the Regulation limits this testing requirement to sumps being used for a specific form of release detection (interstitial monitoring). The following guidance is intended to clarify how staff will evaluate compliance with testing requirements when there are either multiple methods of release detection being performed or there is no evidence of release detection being performed.

Multiple (redundant) release detection:

- Facilities with piping installed on or after September 15, 2010 are required to perform interstitial monitoring. As such, the sumps need to be tested.

- For facilities with piping installed before September 15, 2010, DEQ staff will review release detection records provided by the owner/operator, UST registration information, and any other indications (sump sensors, sump sensor tests) that interstitial monitoring is being used. If the sump is capable of being used for interstitial monitoring then it must be tested, unless the tank owner/operator can clearly demonstrate that they are not using the sump for interstitial monitoring. **Regardless of whether other methods are also being performed, if interstitial monitoring is being used, these sumps must be tested.**

Owner/operator does not provide release detection records:

- Facilities with piping installed on or after September 15, 2010 are required to perform interstitial monitoring. As such, the sumps need to be tested regardless of owner/operator compliance with release detection.

- For facilities with piping installed before September 15, 2010 that are equipped to perform interstitial monitoring (i.e., have double wall piping penetrating the sump), violations of both release detection and sump testing requirements should be cited. The owner/operator will have to test the containment sump unless they
    - amend the UST Notification form to indicate they are not performing interstitial monitoring, and
    - submit leak detection records showing they are in compliance with another method in a timely manner.

- Facilities with piping installed before September 15, 2010 that are not equipped to perform interstitial monitoring (e.g., single wall piping) are not required to test the sump.

3.3.1 Containment Sump and UDC Testing Requirements

Containment sump testing must follow criteria developed by the manufacturer, industry standard (PEI RP1200), or a method approved by DEQ.

Alternative Method Approved by DEQ

If a sump sensor can trigger the submersible turbine pump (STP) or dispenser to shut off, then the tightness of the sump can be tested to a liquid level equal to four inches above sensor activation. This "low level" method is only allowed for systems where the sump sensor can trigger positive shutdown of the STP or dispenser. If the sump sensor shuts off only the dispenser, then an operator must be present at all operating times to shut the pump off or the sump will need to be tested in accordance with another procedure developed by the manufacturer or PEI RP1200 (four inches above the highest penetration test). Appendix A contains Low Liquid Level UST Containment Sump Testing Procedures. Appendix B contains a form that should be used to document this alternative sump test method.

- In order to use the Alternative Method for testing containment sumps and UDCs, the sump sensors must be positioned in accordance with the manufacturer's requirements (touching the sump at the lowest possible point in the sump). **If DEQ identifies improperly placed sensors during an inspection, then the tank owner/operator will be required to re-test the sump(s) and/or UDCs using a criteria developed by the manufacturer or an industry standard (PEI RP1200).**

- This alternative low level test protocol may not be used if the containment sump has cracks, holes, or compromised boots **anywhere in the sump, including above the sensor activation level.** Torn penetration boots, cracks in the containment wall, or any other breeches in containment sumps and UDCs used for interstitial monitoring must be repaired (see Section 4.3). The tank owner/operator should also consider replacing any worn components during the repair process. After repairs are complete, the sump must be tested using the manufacturer's instructions, an industry developed testing method (PEI RP 1200) or another DEQ approved method. **This low level test method may not be used for testing at the time of installation or after a repair.**

Table 4 Testing Requirements for Containment Sumps and UDCs

TESTING REQUIREMENTS FOR CONTAINMENT SUMPS AND UDCs	
Type of Device	**Testing Requirement**
Containment Sump and/or UDC used for interstitial monitoring	New - At time of installation Existing - By 1/1/2021 and every three years thereafter
Containment Sump and/or UDC installed prior to September 15, 2010 and NOT used for interstitial monitoring	Testing not required
Containment Sump and/or UDC installed prior to September 15, 2010 and used for interstitial monitoring	By 1/1/2021 and every three years thereafter
Containment Sump and/or UDC installed prior to September 15, 2010 used as interstitial monitoring but also uses another method of release detection that is in compliance	The containment sump and/or UDC must be tested since the sump is used for interstitial monitoring.
Containment Sump associated with an **empty** Temporarily closed tank	Testing not required unless tank is brought back into use

3.3.2 Test Report Requirements

Testing contractors may use industry developed test forms (PEI RP 1200) or develop their own test forms. At a minimum, the testing form must include the following information:

- Facility name and address
- Date of test
- Testing company name, address and phone number
- Tester Name
- Item tested
- Test method
- Which tanks each containment sump or UDC is associated with and the tank capacity
- Test results (pass or fail)
- Start and Stop time for test, and
- Liquid, pressure, or vacuum level at beginning and end.

3.3.3 Failed Test Results

When a containment sump used for interstitial monitoring fails an integrity test, it must be repaired or closed and replaced. Repairs should be conducted as soon as practicable, but no longer than 30 days or documentation should be provided to DEQ demonstrating that steps are being taken for a timely repair. If faulty equipment is used and its use causes or exacerbates a release, cleanup costs associated with the release may be deemed ineligible for reimbursement from the Virginia Petroleum Storage Tank Fund (VPSTF). A compromised containment sump usually means that the tank owner/operator is out of compliance with secondary containment requirements until the containment is properly repaired or replaced.

Containment sump test failures alone will not be considered suspected releases. If product is contained in a containment sump with a torn penetration boot, a suspected release must be reported only if the product

reaches the damaged portion of the sump. Likewise, if the product level in the sump is above the sump penetrations but a hydrostatic test indicates that the sump and penetrations are tight, then a suspected release does not need to be reported. A closure assessment with soil samples is generally not required when removing a containment sump only and not any associated piping. However, if there is clear evidence of contamination such as stained soils or the presence of strong vapors, a confirmed release should be reported to DEQ within 24 hours.

Repair requirements are discussed in Section 4.3.

3.4 Proper Disposal of Test Water

Owners and operators must properly dispose of test water. There are two options for proper test water disposal:

1. Hydrostatic test water discharges may be authorized under the VPDES (Virginia Pollutant Discharge Elimination System) General Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (Permit VAG83) or by a facility's VPDES Individual Permit, if the permit specifically authorizes the discharge of hydrostatic discharges to water.

2. Place the test water in a drum or tote to store at a bulk location. If the end result for the water is recycling, then the water is not characterized as a hazardous waste. In order to be exempt from the need to make a hazardous waste determination, there has to actually be a market and a viable recycling method in place. The test water must be recycled periodically and cannot be accumulated forever.

3. Dispose of test water in accordance with DEQ's Solid and Hazardous Waste Regulations.

3.5 Recordkeeping

- All equipment testing records must be kept for three years.

- Interstitial monitoring records for double-walled spill prevention equipment and containment sumps used for interstitial monitoring must be kept for as long as the equipment is interstitially monitored.

- Repair records should be kept for the life of the system.

4 Walkthrough Inspections

Facility walkthrough inspections must be conducted periodically beginning no later than January 1, 2021. The purpose of periodic facility walkthrough inspections is to identify equipment problems to prevent releases caused by equipment failure. **Walkthrough inspections are not required for equipment associated with empty temporarily out of use tanks.** The walkthrough inspections have two inspection frequencies:

1. Every 30 days, tank owners/operators must inspect for damage and proper operation of spill buckets, fill pipes and caps, interstitial areas of double-walled spill buckets, and release detection equipment.

   Note: If deliveries occur at intervals greater than every 30 days, the spill buckets can be checked prior to each delivery instead of every 30 days.

2. Annually, tank owners/operators must inspect all containment sumps, under-dispenser containment, interstitial areas of double-walled containment sumps, and handheld release detection equipment for damage, operability, and leaks (if applicable).

4.1 Walkthrough Inspection Requirements

Walkthrough inspections must be conducted using one of two options:

1. Be conducted according to an industry standard such as Petroleum Equipment Institute Recommended Practice RP 900, "Recommended Practices for the Inspection and Maintenance of UST Systems" (PEI RP 900). Owners or operators using PEI RP 900 for inspections must use the entire code of practice to meet the requirement; or

2. Be conducted in accordance with this guidance which serves as a protocol developed by the State Water Control Board, i.e., DEQ-approved protocol (Appendix C).

4.1.1 Qualifications

Walkthrough inspections may be conducted by the tank owner/operator or a third party. DEQ expects qualified individuals to conduct the walkthrough inspections. Option 1 (above) requires a qualified person to conduct the inspections as defined by PEI RP 900. Tank owners/operators must demonstrate that the person conducting the inspections is qualified as defined by the standard.

Option 2 (above) also requires the owners/operators/contractors conducting the inspections to demonstrate that they have the knowledge to conduct walkthrough inspections. The simplest way to demonstrate qualifications for Option 2 is to hold a Class A or Class B UST training certificate. In the event an owner or operator retains a third party contractor to perform the inspections, the contractor may demonstrate qualification by providing a copy of their Class A/B training certification or providing a letter or email demonstrating an experience level commensurate with DEQ's operator training requirements.

4.1.2 30 Day Inspection

At a minimum, the following items must be checked every 30 days or prior to each delivery:

Spill Prevention Device

- Visually check for damage (cracks, holes, or missing fill cap)
- Remove liquid or debris from the spill prevention device
- Check for and remove any obstructions in the fill pipe such as gauging sticks
- Check the fill cap to make sure it is securely on the fill pipe
- For double-walled spill prevention equipment with interstitial monitoring, check for a leak in the interstitial area

Release Detection Equipment

- Check to make sure the equipment is operating with no alarms or other unusual operating conditions such as water in the tank, inconclusive or failed results

- Ensure records of release detection testing are reviewed and are current

- Release detection equipment may be remotely monitored as long as the equipment communicates properly with the remote monitoring equipment

4.1.3 Annual Inspections

At a minimum, the following items must be checked annually (every 365 days):

Containment Sumps and UDCs

All containment sumps and UDCs must be checked as part of the walkthrough requirements regardless of whether they are used for interstitial monitoring or not.

- Visually check for damage (torn penetration boots, holes, cracks, corrosion on pumps and piping, etc.),

- Ensure any sump sensors used for interstitial monitoring are properly positioned,

- Visually check for leaks to the containment area from piping, submersible turbine pump (STP), water leaking in from torn penetrations or cracks in the containment area, or water infiltrating in from the top,

- In a scenario where the STP or UDC areas have only partial containment or retaining walls, only the equipment in the sump needs to be checked for damage (significant corrosion on the STP or piping or faulty installation of an automatic line leak detector),

- Visually check for potential releases to the environment such as product in a compromised containment sump. When product is found in containment sumps a leak must be investigated and the component repaired, if necessary. A suspected release must be reported if the product level is just below or at the same level as the penetrations (indicating product leaked out of the penetration) in the sump or if the source of the product is unknown,

- Remove liquid and/or debris, and

- Check the interstice of interstitially monitored double-walled containment sumps and UDCs to ensure tightness.

Handheld Release Detection Equipment
Handheld release detection equipment includes gauging sticks, vapor monitoring devices, and groundwater bailers. Handheld release detection equipment must be tested for proper operability and serviceability by using the manufacturer's instructions or PEI RP 900.

4.2 Walkthrough Inspection Documentation

- Walkthrough inspections may be documented on PEI RP 900 checklists, the DEQ checklist in Appendix C, other state developed forms, or in house forms developed by tank owners/operators or consultants/contractors.

- Any walkthrough inspection form used must, at a minimum, include the items listed in Section 4.1.

- The walkthrough inspection form must include the following:

    - The date the inspection was conducted,

    - a list of each area checked,

    - whether each area checked was acceptable or needed action taken,

    - a description for the actions taken to correct an issue,

    - delivery records if spill prevention equipment is checked less frequently than every 30 days due to infrequent deliveries, and

    - inspector's initials.

- Records of all walkthrough inspections must be kept for at least one year.

4.3 Equipment Repairs

Repairs should be conducted as soon as practicable, but no longer than 30 days following a failed test result or discovery of a faulty system component. If repairs cannot be conducted immediately, documentation should be provided to DEQ demonstrating that steps are being taken for a timely repair. Acceptable documentation may include a signed contract or a work order detailing the work to be done.

If faulty equipment is used and its use causes or exacerbates a release, cleanup costs associated with the release may be deemed ineligible for reimbursement from the Virginia Petroleum Storage Tank Fund (VPSTF). A compromised containment sump usually means that the tank owner/operator is out of compliance with

secondary containment requirements until the containment is properly repaired or replaced. The faulty equipment may also be out of compliance with the regulatory requirements.

The repaired component must also be tested immediately following the repair to ensure the integrity of the repaired component. All repair materials and repaired components must be compatible with the product stored. Tank owners and operators must keep repair records for the life of the system. Repairs will be verified at the time of inspection or at DEQ's request.

Although DEQ encourages tank owners and operators to be proactive in maintaining the UST equipment, walkthrough inspections may identify equipment issues that do not require repairs or may need additional testing to determine if a repair is necessary. Simply put, repairs are limited to operational issues. Below are some items to consider when trying to determine when a repair is necessary:

- If a containment sump or UDC was installed prior to September 15, 2010 and is not used for interstitial monitoring then it does not need to be repaired. However, for installs on and after September 15, 2010 if a containment sump or UDC has a crack or torn penetration boot and product is present in the sump regardless of the tightness test method used, a suspected release should be reported and the leaking component repaired**. Liquid and debris must be removed from all these sumps.**

- Torn penetration boots, cracks in the containment wall, or any other breeches in containment sumps and UDCs used for interstitial monitoring must be repaired.

- Heavily corroded equipment will need to be replaced if the corrosion affects the operation of the equipment (i.e. submersible pump and piping). DEQ recommends replacement of the equipment when corrosion is significant.

- Repairs to spill buckets, containment sumps, or UDCs must be conducted by using materials that are compatible with the substance stored in the tank. If compatibility cannot be determined, then DEQ will request the owner/operator to demonstrate that the repair materials are compatible.

- If damage that needs repair is identified on a spill bucket, containment sump, or UDC and the contractor or tank owner/operator believes that it may not be compromising the containment system, the owner/operator may opt to tightness test the equipment to demonstrate that the equipment is tight and functional in lieu of repairing or replacing the equipment. If the equipment fails the tightness test, then it must be repaired.

Various examples are provided below.

Example 4.3-1 Cracked spill bucket identified during walkthrough inspection

Scenario: A crack is found in the spill bucket.

Requirement: Since the crack in the spill bucket may affect the operation of the spill bucket, a tightness test may be conducted to determine if the crack goes all the way through the bucket. If the bucket tests tight, the testing documentation must be provided to DEQ and retained for the life of the tank system. The spill bucket will not need to be repaired. If the spill bucket fails the tightness test, then the bucket must be repaired or replaced immediately. Owners/operators may opt to skip the tightness test and repair or replace the bucket to save costs. A tightness test must be conducted after the repair or replacement to ensure the newly repaired or new equipment is tight.

Example 4.3-2 Damaged penetration boot in STP sump not used for interstitial monitoring

Scenario: USTs installed in 2003. A tank operator conducts a walkthrough inspection on July 2, 2021. The tank operator identifies a torn penetration boot in a gasoline STP sump. The last known automatic line leak detector (ALLD) test and annual line tightness test (LTT) for release detection was dated March 16, 2020. The ALLD and LTT test date indicates the most recent tests were performed more than one year ago. The piping is double-walled and drains back to an STP sump where a sump sensor is located for interstitial monitoring. The current UST registration information indicates that the facility was using interstitial monitoring.

Requirement: For facilities with piping installed before September 15, 2010 that are equipped to perform interstitial monitoring (i.e., have double wall piping penetrating the sump), violations of both release detection and sump testing requirement should be cited. The owner/operator will have to test the containment sump unless they

- **amend the UST Notification form to indicate they are not performing interstitial monitoring, and**
- **submit leak detection records showing they are in compliance with another method in a timely manner.**

Example 4.3-3 Crack in UDC wall. UDC is used for interstitial monitoring

Scenario: A tank operator conducts a walkthrough inspection on September 3, 2021 for a UST installed in 2000. The tank operator identifies a crack in the wall of the gasoline UDC. The UDC is used for interstitial monitoring.

Requirement: Since the UDC is used for interstitial monitoring it must immediately be repaired or replaced. A tightness test must be conducted after the repair or replacement to ensure the newly repaired or new equipment is tight.

5 Airport Hydrant Fuel Systems and Field Constructed Tanks

Like the federal regulation, Virginia's 1989 and 2010 UST regulations deferred airport hydrant fuel distribution systems (AHFSs) and field constructed tanks (FCTs) from most of the requirements except corrective action. Newly installed AHFSs and FCTs and the associated underground piping became fully regulated on January 1, 2018; however, some requirements will not be effective for existing tanks until January 1, 2021. This guidance discusses the requirements that become effective for AHFSs and FCTs on January 1, 2021. Guidance No. LPR-SRR-2018-3 "New Underground Storage Tank Requirements Effective January 1, 2018" discussed the requirements that became effective on January 1, 2018. Virginia is relying on EPA published guidance regarding AHFSs and FCTs with the exception of the effective dates. The EPA Publication 510-K-17-002, "Requirements for Field-Constructed Tanks and Airport Hydrant Systems" may be found on EPA's Office of Underground Storage Tanks (OUST) website https://www.epa.gov/ust/publications-about-2015-ust-regulation and in the EPA's technical compendium document at https://www.epa.gov/ust/underground-storage-tank-ust-technical-compendium-about-2015-ust-regulations .

5.1 AHFSs

An airport hydrant fuel distribution system is an UST system, which fuels aircraft and operates under high pressure with large diameter piping that typically terminates into one or more hydrants, also known as fill stands. The hydrant system begins where fuel enters one or more tanks from an external source such as a pipeline, barge, rail car, or other motor fuel carrier. Aboveground storage tanks associated with AHFS systems are partially excluded from the UST Regulation and will be regulated under Virginia's AST Facility and Aboveground Storage Tank Regulation 9 VAC 25-91-10.

Airport hydrant systems often have more than one tank and include:

- Aboveground and underground storage tanks storing aircraft fuel;
- Directly connected underground piping; and
- Other connected tanks holding aircraft fuel such as settling tanks or tanks used to relieve pressure in the system.

Airport hydrant systems do not include:

- Tanks not storing aircraft fuel, for example, additive tanks;
- Tanks not directly connected to the airport hydrant system, for example, tanks used to power an emergency generator in a pump house; and
- Piping connected to those tanks.

Airport hydrant systems may include field-constructed tanks. Field-constructed tanks, which are part of an airport hydrant system, are treated as part of the airport hydrant system and not as separate UST systems.

EPA's Technical Compendium and the EPA handout "Requirements for Field-Constructed Tanks and Airport Hydrant Systems" discuss how to determine if a tank is considered an AHFS tank. EPA's technical compendium document may be found on EPA's Office of Underground Storage Tanks (OUST) website at https://www.epa.gov/ust/underground-storage-tank-ust-technical-compendium-about-2015-ust-regulations and the EPA handout "Requirements for Field-Constructed Tanks and Airport Hydrant Systems" may be found here: https://www.epa.gov/ust/publications-about-2015-ust-regulation.

5.2 FCTs

A field-constructed underground storage tank is a tank constructed in the field. For example, a tank constructed of concrete that is poured in the field, or a steel or fiberglass tank primarily fabricated in the field is considered field constructed.

Field-constructed tanks are not built like conventional UST systems used at gas stations. FCTs are typically bulk underground storage tanks that are built on-site and are not pre-fabricated. FCTs range from conventional sizes to very large capacities containing millions of gallons.

Aboveground FCTs are regulated under Virginia's Facility and Aboveground Storage Tank Regulation 9 VAC 25-91-10.

5.3 FCTs and AHFSs Installed On or Before January 1, 2018

Prior to the 2018 amendments, the only UST regulatory requirement applicable to owners and operators of FCTs and AHFSs was the requirement to perform corrective action in the event of a release from the system. The revised Regulation now makes most UST requirements applicable to these systems.

Owners and operators must meet the following requirements by January 1, 2021:

- One-time notification to DEQ of existence of the system and demonstration of financial responsibility;
- Spill, overfill, and corrosion protection;
- Release detection;
- Operator training; and
- General operating requirements, including compatibility, repairs, and periodic testing and walk through inspections.

Owners and operators of FCTs or AHFSs permanently closed or emptied before January 1, 2018 are not subject to the registration or closure requirements unless a release from the UST may pose a current or potential threat to human health and the environment. FCTs or AHFSs containing product on or after January 1, 2018 are subject to registration and closure requirements unless the tank was last used prior to December 22, 1988.

5.4 FCTs and AHFSs Installed On or After January 1, 2018

The following requirements must be met at installation:

- Notification;
- Financial responsibility;
- Spill, overfill, and corrosion protection;
- Release detection;

- General operating requirements, including compatibility and repairs; and
- Release response, reporting, corrective action, and closure.

These requirements must be met by January 1, 2021:

- Operator training;
- Walkthrough inspections; and
- Release detection equipment testing.

5.5 FCTs, AHFSs, or Underground Piping Associated With FCTs Less Than 50,000 Gallons and Installed or Replaced On or After January 1, 2018

Owners and operators must meet the following in addition to the requirements listed above for FCTs and AHFSs installed or replaced on and after January 1, 2018:

- Secondary containment with interstitial monitoring; and
- Under-dispenser containment for new dispenser systems.

5.6 FCTs and AHFSs Installed On or After January 1, 2021

All requirements must be met at installation.

The following differences to the UST requirements only apply to FCTs and AHFSs:

- Alternative release detection options may be used.
- After January 1, 2018, single-walled piping may be installed when replacing piping for FCTs greater than 50,000 gallons and piping associated with AHFSs.
- Periodic walkthroughs include hydrant pits and vaults.
- Hydrant pits- visually check for any damage; remove any liquid or debris; and check for any leaks.
- Hydrant piping vaults – check for any hydrant piping leaks.

Most of the UST requirements are applicable to FCTs and AHFSs. Detailed information regarding the UST requirements specific to FCTS and AHFSs, release reporting, and recordkeeping are discussed in the EPA Publication 510-K-17-002, "Requirements for Field-Constructed Tanks and Airport Hydrant Systems" that may be found on DEQ's website here: https://www.deq.virginia.gov/Programs/LandProtectionRevitalization/PetroleumProgram/StorageTanks/UndergroundStorageTanks/USTComplianceAssistance.aspx.

APPENDICES

Appendix A Low Liquid Level UST Containment Sump Testing Procedures

This document provides procedures for low liquid level hydrostatic testing as one method of meeting the requirements in Virginia's Underground Storage Tanks regulations (the Regulation) for periodically testing the integrity of certain containment sumps. The Regulation at 9VAC25-580-82.A.1 requires that owners and operators using interstitial monitoring of UST system piping as their primary release detection method prevent releases to the environment by ensuring the integrity of each containment sump used for interstitial monitoring of piping.

Each containment sump used for interstitial monitoring of piping must be tested using a vacuum, pressure, or liquid testing method at least once every three years to ensure the equipment is liquid tight according to one of these criteria in the Regulation[1]:

- Requirements developed by the manufacturer – owners and operators may use this option only if the manufacturer developed requirements;

- Code of practice developed by a nationally recognized association or independent testing laboratory – DEQ will accept the integrity test method listed in the Petroleum Equipment Institute (PEI) Publication RP1200*, Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities*, available on PEI's website https://www.pei.org/recommended-practices; or

- Requirements determined by DEQ to be no less protective of human health and the environment than the two requirements listed above.

DEQ determined that the requirements, including meeting the conditions and following the procedures, in this document are no less protective of human health and the environment as the first two requirements listed above.

These procedures cover:

- Required conditions
- Pre-testing checklist
- Testing steps, and
- After completing the tests.

In addition, **Appendix B** contains a sample form that you may use to document compliance with these procedures.

Required Conditions

The sumps must meet these conditions to use this test method and comply with the regulatory requirements:

[1] Testing is not required if the containment sump is double walled and the integrity of both walls is periodically monitored at the same frequency of walkthrough inspections.

- A liquid sensor is mounted and remains at the lowest point in the sump. If the liquid sensor is not located at the lowest point in the sump at the time of the test or during a DEQ inspection, then this alternative test procedure may not be used.

- An owner/operator is required to test the functionality of the liquid level sensor in conjunction with the low level sump test and verify that the sensor works correctly and shuts down the appropriate pump or dispenser. In addition, an annual test of any liquid sensor used as part of a release detection system must be conducted. The test of the liquid level sensor performed at the time of low level sump testing may be used to comply with the annual sensor test requirements, if all other conditions of the Regulation are completed as required.

- And either:
  - The pump automatically shuts off when liquid activates the sensor, or
  - The dispenser automatically shuts off when liquid activates the sensor, and the facility is always staffed when the pumps are operational.

To use these procedures, ensure all sensors are properly installed and programmed so that they shut off either the pump or dispenser per the instructions above when the sensor detects liquid. You may only use these instructions if your sensors are programmed to both alarm and shut off when in contact with any liquid.

Under no circumstances should the low liquid level hydrostatic sump testing protocol be used for initial testing of newly installed containment sumps or for testing of containment sumps after they have been repaired.

Pre-testing Checklist

Check the three items listed below before using the following step-by-step instructions to perform the low liquid level hydrostatic testing of a containment sump. If after checking the three items you find no issues, then follow the step-by-step instructions to hydrostatically test the containment sump using a low liquid level. If you find issues, you should not test your sump using the step-by-step instructions until you address the issues and your sump passes this pretesting checklist.

Check 1 – Determine if there is liquid present in the sump at levels high enough to trigger a properly positioned sensor, even if the alarm is not activated. An active alarm may need to be treated as a suspected release. Remove any debris or liquid in the containment sump prior to testing.

Check 2 – Identify if sensors' positions are elevated or otherwise manipulated to prevent activation.

- At this point, DEQ recommends that you visually inspect the sensor and electrical connections for signs of damage or corrosion that may indicate that functioning is impaired. Signs of corrosion suggest the sensor may soon deteriorate and become inoperable. If you believe the sensor is damaged, check with the manufacturer and follow their instructions for repair.

Check 3 – Determine if the sump has cracks, holes, or compromised boots located in the portion of the sump where water will be added during the low liquid sump test. The test requires you add at least 4 inches of water above the height required for sensor activation, so this area must be free of cracks, holes, or compromised boots. **If any of these are present in this area, this low level test method cannot be used.**

- At this point, DEQ requires you to visually inspect the entire sump. Cracks, holes, or compromised boots anywhere in the sump, including above the sensor activation level, may indicate a degrading sump. Torn penetration boots, cracks in the containment wall, or any other breeches in containment sumps and UDCs used for interstitial monitoring must be repaired. Consider replacing any worn components. After repairs are complete, the sump must be tested using manufacturer's instructions, an industry developed testing method (PEI RP 1200) or another DEQ approved method. **This low level test method may not be used for testing after a repair due to the regulatory definition of a containment sump.**

Testing Steps

Part A contains steps to test sump sensors for functionality and the ability to shut down product flow. Part B contains steps to test the integrity of the sump itself.

Part A – Functional testing of the sump sensor

Step 1 – Prepare for the sensor functionality test by determining and documenting how the test should be performed.

- Determine the manufacturer of your sensor and details of how the manufacturer specifies a functionality test be performed. A functionality test is performed by adding sufficient liquid to the sump to ensure the sensor activates, unless the manufacturer specifies a different method.

- Different sensor manufacturers may specify different procedures or volumes of water to properly test their products; you must perform the sensor activation test according to the sensor manufacturer's instructions for testing non-discriminating or discriminating sensors. Some manufacturers may specify testing in a container other than in the sump. If your manufacturer specifies testing in the sump, proceed to complete the test by moving to step 2. If the manufacturer specifies testing in a separate container, complete the test and replace the sensor in the sump and proceed to step 2.

- Ensure you keep written documentation from the manufacturer detailing the required procedure and minimum amount of liquid required to activate the sensor, in case DEQ requests it.

Step 2 – Secure a measuring stick vertically against the wall nearest the lowest level of the sump and ensure it is located in a visually accessible place so you can read the markings on the measuring stick. Use a clamp, tape, or other adhesive method to immobilize the stick for the entire course of the test, even while the measuring stick is underwater. Leave several inches of markings visible, ideally between 2 to 8 inches from the bottom of the sump.[2]

Step 3 – According to the manufacturer's instructions, immerse the sensor in liquid at least to a height that ensures the sensor alarm can activate.

Step 4 – Determine if the sensor is in alarm.

[2] It may be impractical to access the bottom of some sumps to install a measuring stick against the wall. For this reason or other reasons, some owners or operators may choose to use a float and console type of probe to perform liquid integrity testing. Owners/operators planning to use a float and console type method should position it in the sump in lieu of securing a measuring stick against the wall.

- You may only use this low level procedure if the sensor alarm activates at the level set per manufacturer's instructions. If a sensor failed, you may use this procedure only if the failed sensor is repaired or replaced and an alarm activates.

Step 5 – If the sensor alarms successfully, verify that either:

- The pump has automatically shut off when liquid activated the sensor, or
- The dispenser has automatically shut off when liquid activated the sensor, and the facility is always staffed when the pumps are operational.

Step 6 – If the sensor: (a) passed the visual inspection, (b) passed the functional inspection for the alarm, and (c) each pump or dispenser is disabled, then go to Part B for integrity testing.

Part B –Testing the integrity of a containment sump

Step 1 – If necessary, add more water into the sump until the liquid level is at least 4 inches above the height required to activate the sensor.

- If you are testing other sumps, remove the sensor from this sump now before adding water. Removing the sensor from the liquid allows for testing other sensors in the UST system for functionality and positive shutdown without interrupting the one-hour liquid tightness test of this sump.

Step 2 – Wait 15 minutes.

- Waiting allows the water level sufficient time to settle in case there is sump deflection from the weight of the added water.

Step 3 – Measure and record the liquid height in the sump. Document the level and the current time on the test report form.

Step 4 – Do not disturb the water in the sump for at least one hour.

Step 5 – After one hour has elapsed since measuring the height of the liquid, check the liquid level again. Record the liquid measurement and the current time on the test report form.

Step 6 – Compare the two liquid measurement numbers. If the level has dropped by more than 1/8 inch, then the sump failed the low liquid level hydrostatic integrity test. Record the result on the test report form.

After Completing the Tests

Step 1 – Remove the measuring stick from the sump.

Step 2 – Remove water from the sump.[3]

Step 3 – Reposition the sensor and replace the sump cover and manhole cover.

[3] When done with sump testing, properly dispose of the sump test water according to appropriate wastewater disposal authority requirements per the instructions in section 3.4 of the Guidance

Appendix B Sample Form For Documenting Compliance With Low Liquid Level UST Containment Sump Testing Procedures

DEQ Facility ID Number: _____Facility Name: _____

Company: _____

Street Address: _____ City: _____ State: _____ Zip: _____

County: _____

Testing Company Name and Number, If Applicable: _____

Street Address: _____ City: _____State: _____ Zip

County: _____

Tester Name, Printed: _____Signature: _____

Date of Test_____/_____/_____

Instructions: Unless instructed otherwise, place your initials in the boxes on the right side of this form to indicate compliance with the checklist or steps for each sump.			**Sump 1**	**Sump 2**	**Sump 3**	**Sump 4**
Pre-testing Checklist	1	Determine if there is liquid present in the sump at levels high enough to trigger a properly positioned sensor, even if the alarm is not activated. Remove any debris or liquid in the containment sump prior to testing.				
	2	Identify if sensors' positions are elevated or otherwise manipulated to prevent activation.				
	3	Confirm the sump has no cracks, holes, or compromised boots located in the portion of the sump where water will be added during the low liquid sump test. The test requires you add at least 4 inches of water above the height required for sensor activation, so this area must be free of cracks, holes, or compromised boots. If any of these are present in this area, this test method cannot be used.				
Part A – Functional Testing Steps	1	Prepare for the sensor functionality test by determining and documenting how the test should be performed.				
	2	Secure a measuring stick vertically against the wall nearest the lowest level of the sump and ensure it is in a visually accessible place so you can read the markings on the measuring stick. Use a clamp, tape, or other adhesive method to immobilize the stick for the entire course of the test, even while the measuring stick is underwater. Leave several inches of markings visible, ideally between 2 to 8 inches from the bottom of the sump. Some owners/operators may choose to use a float and console type of probe instead of a measuring stick.				
	3	Immerse the sensor in liquid at least to a height that ensures the sensor is activated and alarm activates.				
	4	Determine if the sensor is in alarm.				
	5	If the sensor alarms successfully, verify that either: The pump has automatically shut off when liquid activated the sensor; or the dispenser has automatically shut off when liquid activated the sensor, and the facility is always staffed when the pumps are operational.				
	6	If the sensor passed the visual inspection, the functional inspection for alarm, and each pump or dispenser is disabled, continue to Part B for liquid tightness and integrity testing. Write pass or fail in the box on the right.	(Ex. Pass)			

Instructions: Unless instructed otherwise, place your initials in the boxes on the right side of this form to indicate compliance with the checklist or steps for each sump.			**Sump 1**	**Sump 2**	**Sump 3**	**Sump 4**
Part B – Integrity Testing Steps	1	If necessary, add more water into the sump until the liquid level is at least 4 inches above the height required to activate the sensor.				
	2	Wait 15 minutes.				
	3	Measure and record the liquid height in the sump. Document the level and the current time on the test report form. Record the level and time in the box on the right.				
	4	Do not disturb the water in the sump for at least one hour.				
	5	After one hour has elapsed since measuring the height of the liquid, check the liquid level again. Record the liquid measurement and the current time on the test report form. Record the level and time in the box on the right.				
	6	Compare the two liquid measurement numbers. If the level has dropped by more than 1/8 inch, then the sump failed the low liquid level hydrostatic integrity test. Write pass or fail in the box on the right.				
After Test Steps	1	Remove the measuring stick or probe from the sump.				
	2	Remove as much water from the sump as possible. Ensure you properly dispose of the sump test water according to all legal requirements.				
	3	Reposition the sensor, if needed, and replace the sump cover and manhole cover.				
Data	1	Starting Water Level				
	2	Test Start Time				
	3	Ending Water Level				
	4	Test End Time				
	5	Test Period (Minimum test time: 1 hour)				
	6	Water Level Change				
		Indicate Pass Or Fail For Each Sump				

Appendix C Sample Walkthrough Inspection Checklist

Date Of Inspection												
Required Every 30 Days (exception: if your UST system receives deliveries at intervals greater than 30 days, you may check your spill prevention equipment prior to each delivery.												
Visually check spill prevention equipment for damage. Remove liquid or debris.												
Check for and remove obstructions in fill pipe.												
Check fill cap to ensure it is securely on fill pipe.												
For double-walled spill prevention equipment with interstitial monitoring, check for a leak in the interstitial area.												
Check release detection equipment to ensure it is operating with no alarms or unusual operating conditions present.												
Review and keep current release detection records.												
Required Annually												
Visually check containment sumps for damage and leaks to the containment area or releases to the environment.												
Remove liquid in contained sumps or debris.												
For double-walled containment sumps with interstitial monitoring, check for leaks in the interstitial area.												
Check hand-held release detection equipment, such as groundwater bailers and tank gauge sticks, for operability and serviceability.												
Recommended Activities												
Fill and monitoring ports: Inspect all fill or monitoring ports and other access points to make sure that the covers and caps are tightly sealed and locked.												
Spill and overfill response supplies: Inventory and inspect the emergency spill response supplies. If the supplies are low, restock the supplies. Inspect supplies for deterioration and improper functioning.												
Containment sump areas: Look for significant corrosion on the UST equipment.												
Dispenser hoses, nozzles, and breakaways: Inspect for loose fittings, deterioration, obvious signs of leaks, and improper functioning.												

Your initials in each box below the date of the inspection indicate the device or system was inspected and satisfactory on that date.

In the following table, explain actions taken to fix issues.

Date	Action Taken

Keep this record for at least one year after last inspection date on the form