

Section 4.7: Leak Detection for Tanks



Except for tanks that contain used oil (sometimes also referred to as “waste oil”) all underground storage tanks in Vermont must maintain and reconcile inventory records. In addition to inventory monitoring, another method of leak detection (also called release detection) must be used.



The only allowable method for leak detection for single-walled tanks larger than 550 gallons is **in-tank monitoring (also called automatic tank gauging, or ATG)**, combined with **inventory control**. For tanks with secondary containment, or double-walled tanks, the only allowable method of leak detection is **interstitial monitoring** combined with **inventory control**.

General Requirements and BMPs for ALL Tank Leak Detection Methods



All release detection equipment shall be calibrated and maintained in a fully operational state.



You are required to record your inventory for **every operating day**, and you are required to reconcile the inventory **monthly**.



If your single-wall tank uses an in-tank monitor (also called an automatic tank gauge, or ATG), you must run a leak test **every week**.



Your release detection system must be installed, calibrated, operated, and maintained according to the manufacturer’s instructions.



If you ever suspect or confirm a release, you must take appropriate action and, if necessary, report the release. Refer to Section 4.9 for information on what to do. **Never ignore leak detection alarms or failed leak detection tests. Treat them as suspected leaks!**



If you have hazardous substance tanks (as defined under the Comprehensive Environmental Response, Compensation, and Liability Act), you must have double-walled tanks and use interstitial monitoring for release detection.



All leak monitoring devices must not be shut off or deactivated at any time except for repair. Any deactivation must be reported to DEC. All automated monitoring devices must employ an audible alarm and a visual indicator, which must be located so as to be heard and seen by the owner/operator or other personnel during normal working hours.



Keep all schedules of required calibration and maintenance provided by the equipment manufacturer.



Periodically have a qualified UST contractor, such as the vendor who installed your release detection system, service all the system components according to the manufacturer’s service instructions.

- Components can wear out and must be checked periodically. Many vendors recommend or require this maintenance activity at least once annually.

- ✓ Make sure your vendor or installer provides you with the information and training necessary to make sure your release detection equipment works effectively. If you don't know how your system works, you will fail inspections and may find yourself with violations and penalties. Worse, you may discover that you have had a leak. It is your responsibility to know how to operate all your release detection devices properly so that you meet regulatory requirements and protect the environment.
- ✓ Make sure employees who run, monitor, or maintain the release detection system are aware of correct operating procedures. Develop and maintain regular training programs for all employees.

To determine requirements and BMPs for release detection of your tank(s), do the following:

1. Identify the type(s) of release detection you use for your tanks. Check the appropriate boxes in the table below.

Different tanks at your facility may use different types of leak detection. Make sure to select the appropriate type of leak detection for each tank at your facility.

2. For each row you checked, go to the appropriate section and read and fill out the appropriate checklist(s). You may need to go to more than one section of the self-certification checklist.

What type(s) of leak detection do you use for your tank(s)?	UST Number:				Go to these sections for information
	1	2	3	4	
In-tank Monitor (a.k.a. Automatic Tank Gauging)					Section 4.7.1
Interstitial Monitoring for Double-Walled Tanks					Section 4.7.2
Inventory Control					Section 4.7.3
Manual Tank Gauging					Section 4.7.4
Alternate Method					Section 4.7.5
Check here if your tank contains a hazardous substance					
Check here if your tank contains a hazardous substance					Section 4.7.2

If your tank leak detection is not listed above, contact DEC to determine what you must do.

If you know the type(s) of leak detection you have, skip the description information below and proceed as instructed in the table above. Otherwise, take the following steps to figure out what is at your facility:

- Read the descriptions of the different tank leak detection types provided below. Look through your old records to see if they match any of the names in the descriptions.
- Contact the contractor who installed your leak detection system.

Leak Detection Descriptions

In-tank Monitor/ATG - An ATG system consists of a probe permanently installed in a tank and wired to a monitor to provide information such as fuel level and temperature. You should have an ATG monitor mounted somewhere at your facility. ATG systems automatically calculate the changes in fuel volume that can indicate a leaking tank and can be set to alarm when there is a suspected problem with your tank.



Sample ATG Monitor



Sample ATG Monitor

Interstitial Monitoring in Double-Walled Tanks - Secondary containment is an additional barrier between the portion of a UST system that contains fuel and the outside environment. Secondary containment is provided by the outer tank wall of a double-walled system.

Hazardous substance tanks must be double-walled with interstitial monitoring or you must obtain a waiver from DEC. The area between the inner and outer barriers is called the interstitial space (or annular space). You must have interstitial monitoring ports on the pavement at your facility. You may have electronic probes in the interstitial space, which are connected to and monitored continuously by electronic monitoring system. If you do not have electronic monitoring, you must conduct manual interstitial space monitoring using a gauge stick.

Inventory Control - This method involves measuring the contents of the tank and recording the amount of fuel pumped each day and reconciling that data with measurements and records of fuel delivery. Typically, a measuring stick or an ATG is used to take the measurements.



Sample Part of a Measuring Stick

4.7.1 In-Tank Monitors (ITM)/Automatic Tank Gauges (ATG)



In-tank monitors (ITM), also commonly known as automatic tank gauges (ATG), automatically calculate the changes in fuel volume that can indicate a leaking tank. ATG is not required for tanks upgraded by lining or cathodic protection for the first 10 years after the upgrade.



Sample ATG

Requirements and BMPs for ATG Systems



LEAK DETECTION TEST

You are required to use your ATG system to test for leaks at least once every **week**.

- Remember to test each tank.
- Make sure you are properly testing the portion of the tank that routinely contains regulated substances.
- Make sure that the amount of fuel in your tank is sufficient to run the ATG leak test. The tank must contain a minimum amount of fuel to perform a valid leak detection test. One source for determining the minimum amount of fuel is the performance certification for your leak detection equipment.

Your equipment must be capable of at least 0.2 gallon per hour (GPH) accuracy.



SYSTEM CHECK

- Your ATG system must be tested on a monthly basis to ensure that it is operating according to the manufacturer's specifications. Read your owner's manual, run the appropriate tests, and see if your ATG system is set up and working properly.
- Most ATG systems have a "test" or "self-diagnosis" mode that may run these checks.



All records pertaining to the equipment manufacturer, warranties, maintenance requirements, repairs, and testing shall be maintained on-site for the life of the system or at an alternative location approved by the Secretary in writing.



All ATG systems should be inspected, calibrated, and tested annually by a qualified contractor to insure proper operation.

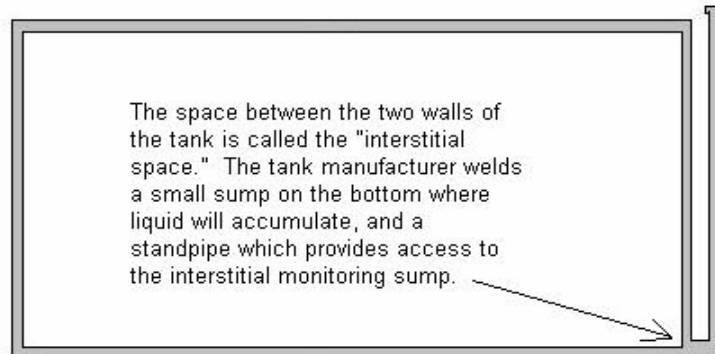


Test your tanks more frequently to catch leaks sooner and reduce cleanup costs and problems.



Periodically have a qualified UST contractor, such as the vendor who installed your ATG, service all the ATG system components according to the manufacturer's service instructions. Many vendors recommend or require this maintenance activity at least once a year.

4.7.2 Interstitial Monitoring



The space between the two walls of the tank is called the "interstitial space." The tank manufacturer welds a small sump on the bottom where liquid will accumulate, and a standpipe which provides access to the interstitial monitoring sump.

Double-walled tanks have an additional barrier between the portion of an UST system that contains regulated substances and the outside environment. Secondary containment is provided by the outer tank wall of a double-walled system. The area between the inner and outer walls is called the interstitial space or annular space and can be monitored to catch problems before regulated substances reach the environment.



Chemical tanks must be double-walled with interstitial monitoring.

4.7.2.1 Manual Interstitial Monitoring

Requirements and BMPs for Manual Interstitial Monitoring



To monitor the interstitial space of a tank manually, lower a measuring stick into the dry space. If the stick comes up dry, there are no leaks. Water on the stick suggests the possibility of an outer wall leak, while product suggests that there may be a breach of the inner wall. To monitor for leaks regarding **double walled piping** (interstitial), a visual inspection of the piping sumps is required.



You must conduct manual interstitial monitoring at least once per week.



You must keep records of all manual interstitial monitoring for the last 52 weeks.



Your calibrated measuring stick must be long enough to reach the bottom of the interstitial space.



The interstice monitoring port for the tank must be readily accessible.



If you conduct manual interstitial monitoring, consider switching to electronic interstitial monitoring. Although electronic monitoring is not required, it will help you detect leaks as soon as they happen and respond to the problem as soon as possible. Many tank owners and operators find it inconvenient to check the interstitial space manually every week, especially during the winter. Also, with weekly manual interstitial monitoring, your system could be leaking for days before you discover the leak in your weekly check.

4.7.2.2 Electronic Interstitial Monitoring

Electronic interstitial monitoring systems must be designed, constructed, and installed to detect a leak from any part of the tank system that routinely contains fuel which includes piping.

Requirements and BMPs for Double-Walled Tanks with Interstitial Monitoring



All leak monitoring devices must not be shut off or deactivated at any time except for repair and any deactivation must be reported to DEC. All monitoring devices shall employ an audible alarm and a visual indicator, which shall be located as to be heard and seen by the owner/operator or other personnel during normal working hours.



SYSTEM CHECK

You are required to test your interstitial monitoring system weekly to ensure it is operating effectively.

- Read your owner's manual, run the appropriate tests, and see if your interstitial monitoring system is set up and working properly.
 - Most interstitial monitoring systems have a "test" or "self diagnosis" mode that may run these checks.
- Verify that the self-test button indicates that the monitor is working correctly.
- Verify that the system status report does not indicate any problems.
- Verify that the system is not in "alarm mode," or giving a visible or audible alarm.

If the system check reveals any problems, you must resolve them, as they may affect your ability to detect and respond to a leak, and may indicate that a leak exists.



You must maintain records of weekly monitoring for one year. If your system does not have a print function, then maintain a manual log for your weekly monitoring.



Periodically have a qualified UST contractor, such as the vendor who installed your electronic interstitial monitoring system, service, inspect, calibrate, and test all the system components according to the manufacturer's service instructions.

4.7.3 Inventory Control

Requirements and BMPs for Inventory Control for all Tanks With Dispenser Metering Units

The US EPA has published a booklet that explains how to conduct inventory reconciliation, called “Doing Inventory Control Right For Underground Storage Tanks.” Contact the DEC’s UST Program if you wish to obtain a copy.



For Inventory Control you must do the following:

- Take inventory and dispenser readings and record the numbers at least once each day that fuel is added to or removed from your tank.
- Reconcile fuel deliveries with delivery receipts by taking inventory readings before and after each delivery.
- Reconcile all of your data at least once every 30 days. If the monthly reconciliation indicates a discrepancy of 1 percent or more of the flow-through plus 130 gallons, it must be reported to the Department. If the variance has exceeded 1 percent for two consecutive months, you must report that to DEC as well.



Your equipment (for example: a stick or electronic monitoring device) must be capable of measuring to the nearest one-eighth inch and be able to measure the level of fuel over the full range of the tank’s height.

- Check your measuring stick periodically to make sure that you can read the markings and numbers and that the bottom of the stick is not worn.



You must measure the water in your tank to the nearest one-eighth inch at least once per month.

- You can use a paste that changes color when it comes into contact with water.



You must ensure that your fuel dispensers are calibrated according to local standards or to an accuracy of 6 cubic inches for every 5 gallons of fuel withdrawn.

- Look on your dispenser for a weights and measures sticker or contact your local department of weights and measures.



You must keep records for the last 12 months of inventory control.

4.7.4 Manual Tank Gauging for Single-Walled Tanks with a Capacity of Less Than 550 Gallons

Requirements and BMPs for manual tank gauging for single-walled tanks of 550 gallons or less

The U.S. EPA has published a booklet that explains how to conduct manual tank gauging. Contact the DEC UST Program if you wish to obtain a copy.



Manual tank gauging is typically used as a method of release detection only for tanks that hold used oil, and is only allowable for tanks with a capacity of 550 gallons or less.



For Manual Tank Gauging for single-walled tanks of 550 gallons or less, you must do the following:

- Once each week, the tank must go into a “quiet period” for 36 hours. During this time, nothing is added to, or removed from, the tank. At the beginning and end of the quiet period, perform liquid level measurements. To ensure accuracy, each measurement must be done twice. The difference in volume from the beginning to the end of the quiet period must be 10 gallons or less.
- Once a month, average the four weekly changes in tank volume (taking into consideration positive and negative numbers). This average is required to be 5 gallons or less.
- If any weekly or monthly change exceeds the allowable amount, then a leak is suspected and you must contact DEC immediately.



Your stick must be capable of measuring to the nearest one-eighth inch and be able to measure the liquid level inside the tank over the full range of the tank’s height.

- Check your measuring stick periodically to make sure that you can read the markings and numbers and that the bottom of the stick is not worn.



You must measure the water in your tank to the nearest one-eighth inch at least once per month.

- You can use a paste that changes color when it comes into contact with water.



You must keep manual tank gauging records for the last 12 months.

4.7.5 Alternate Methods



You may comply with the leak detection requirements through an alternate method not listed above, with approval from DEC, if the leak detection method is capable of detecting all leaks and you have records that show that the alternate method consistently detects leaks. Contact the DEC for more information.



Some facilities have used vapor monitoring or groundwater monitoring wells for leak detection. Those methods of release detection monitoring are being phased out in Vermont.