KANSAS

Underground Storage Tank MANUAL

FOR OWNERS AND OPERATORS

Pollution Prevention Institute

Kansas Department of Health and Environment

Paid for, in part, by the Kansas Department of Health and Environment

Kansas Department of Health and Environment

District Offices

Northwest District Office

2301 E. 13th Street
Hays, Kansas 67601-2651
Phone: (785) 261-6100
FAX: (785) 625-4005
KDHE.NWDOAdmin@ks.gov

Southwest District Office

302 West McArtor Road
Dodge City, KS 67801-6014
Phone: (620) 682-7940
FAX: (620) 225-3731
KDHE.SWDOAdmin@ks.gov

North Central District Office

3040 Enterprise Dr.
Salina, KS 67401
Phone (785) 827-9639
FAX: (785) 559-4330
KDHE.NCDOadmin@ks.gov

South Central District Office

300 West Douglas, Suite 700
Wichita, KS 67202-2921
Phone: (316) 337-6020
FAX: (316) 337-6055
KDHE.SCDOAdmin@ks.gov

Northeast District Office

800 West 24th Street
Lawrence, Kansas 66046-4417
Phone: (785) 842-4600
FAX: (785) 842-3537
KDHE.NEDO.admin@ks.gov

Southeast District Office

308 W 14th Street
Chanute, KS 66720
Phone: (620) 431-2390
FAX: (620) 431-1211
KDHE.SEDOAdmin@ks.gov

UST releases should be reported to the
Leaking Underground Storage Tank Unit
785-296-6768
or to the appropriate district office for your area.

Spills of 25 gallons or more, or those that cause a sheen on water, should be reported to **785-296-1679**.

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Chapter 1: Introduction

Why are storage tanks regulated?

In short, storage tanks are regulated because of the possible consequences of poor management. Only storage tanks containing materials considered hazardous are regulated. If these substances are not contained properly, they can cause property damage, harm local wildlife, kill off plants, and result in injury, illness, and even death in humans.

Two USTs mid-installation

The main purpose of this document is to help you understand the regulations as they apply to your facility. You will find general requirements, some basic information on underground storage tank systems, and tips to help you understand what applies to you and what you need to do to comply. These regulations are designed to prevent releases of hazardous substances from storage tank systems. The information in this document can help keep you, your employees, your customers, and your neighbors safe; preserve personal property as well as our environment; and save you money. It will help you avoid fines and costly repairs while minimizing loss of valuable product.

How are storage tanks regulated in Kansas?

Storage tanks are divided into **aboveground storage tanks**, or **AST**s, and **underground storage tanks**, or **UST**s. USTs are more tightly regulated than ASTs due to greater difficulty in identifying, containing, and resolving releases and greater risk of damage to the system from sources such as corrosion. If at least 90% of a tank system's volume, including piping, is above ground, then the tank is considered an AST. Any storage tank situated in an underground area such as a basement, cellar, mine working, drift, shaft or tunnel, and above the surface of the floor is also considered an AST. Otherwise, the tank is classified as a UST.

Both USTs and ASTs have requirements from the **Environmental Protection Agency**, or **EPA**, or from the **Kansas Department of Health and Environment**, or **KDHE**, and from the **Kansas Fire Marshall's Office**, or **KSFMO**. This document focuses on KDHE's regulations.

For underground storage tanks, the EPA sets standards for environmental regulations of storage tanks, but they do not determine the final regulations in all states. Some states, including Kansas, have state program approval, or SPA. This means within certain requirements the EPA allows them to determine their regulations and carry out all functions necessary for a program regulating storage tanks such as permitting, inspections, and enforcement. Therefore, KDHE oversees the regulation of storage tanks in Kansas. KSFMO sets safety training requirements for UST operators in addition to the training requirements set by KDHE.

KDHE also regulates ASTs, but there are far fewer requirements than for USTs. Most of the regulations regarding ASTs in Kansas are under the KSFMO.

Storage tanks are regulated based on the substance they hold. Tanks are subject to full regulations, either AST or UST, if they contain any of the following regulated substances:

- Liquid petroleum product fuels such as fuel oil, diesel, gasoline, kerosene, aviation fuels, and bio-fuels (ethanol, gasoline-ethanol blends, biodiesel, and associated blends)
- Flammable or combustible liquids
- Liquid hazardous substances listed in Table 302.4 of the Comprehensive Environmental Response Compensation, and Liability Act, or CERCLA
- Used oil

Tanks floating due to stormwater intrusion during installation before securing anchoring system

Certain tanks are exempt from regulation such as the following:

UST and AST

- Tanks used for family farm or residential fuel supplies with a capacity of 1,100 gallons or less
- Single-family residence heating-oil storage tanks
- Flow-through process tanks
- Wastewater treatment tank systems as part of wastewater treatment facilities regulated under section 402 or 307(b) of the Clean Water Act
- Tanks containing petroleum products that are not liquid at standard temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute). This exemption excludes propane, natural gas, and similar products from regulation by the KDHE under the Kansas Storage Tank Act. It also excludes most types of asphaltic materials that are solids at standard temperatures.
- Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks

UST

- Any UST system holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances
- Any UST system that contains a de minimis concentration of regulated substances
- Any emergency spill or overflow containment UST system that is expeditiously emptied after use
- Septic tanks
- Tanks with a capacity of 110 gallons or less

AST

- Tanks located at crude-oil production, transport, and refining facilities
- Tanks containing agricultural materials regulated by the Kansas Department of Agriculture (e.g., liquid fertilizers and pesticides)
- Small tanks having less than 660 gallons capacity used for business or retail purposes

Registration and operating permits are not required for temporary ASTs, e.g., those mounted on wheels or at the same physical location for less than a year.

Partial exclusions

Not all tanks have to meet all requirements. **Partially excluded** tanks include wastewater treatment systems not fully excluded, UST systems containing radioactive material regulated under the Atomic Energy Act of 1954, any UST system that is part of an emergency generator system at nuclear-power-generation facilities licensed by the Nuclear Regulatory Commission and subject to Nuclear Regulatory Commission requirements regarding design and quality criteria, and ASTs associated with airport hydrant fuel-distribution systems or UST systems with field-constructed tanks. Partially excluded tanks are subject to standards of construction similar to those for non-excluded USTs, and to the same release reporting and financial responsibility requirements.

Partially excluded systems installed on or before July 6, 2020 are required to meet release reporting, response, and investigation; closure; and financial responsibility and notification requirements by July 6, 2020, and release detection, UST upgrade, operator training ,and general operating requirements by October 13, 2021. Systems installed after July 6, 2020 must meet these requirements immediately.

Chapter 2: Aboveground Storage Tanks

All ASTs must be registered with KDHE and have valid permits. To register a tank the owner must submit the form provided by KDHE, which asks for details such as owner's contact information, location of facility, type of regulated substance stored, as well as details about the tank such as status, age, and capacity. The owner must also pay a registration fee of $10 per tank. Registration of tanks below the regulated size is not required and does not cost, but it allows the owners to seek reimbursement from the trust fund for approved corrective action associated with tank spills or leaks. Once the tank is registered, the owner will receive the operating permit. Permits are valid from Aug. 1 to July 31 and must be renewed by Dec. 31 of each year. To renew a permit, the owner must review the information on their permit, make any necessary corrections and submit to KDHE with $10 permitting fee. Late submission will result in an additional fee of $50 per tank.

A horizontal storage tank (left) and a field-constructed tank (right)

Starting in 2020, all permits issued by KDHE can be renewed online, using the Kansas Environmental Information Management System, or KEIMS, at https://www.kdheks.gov/ber/keims.html. Owners, operators, and others authorized by the facility can access the facility's KEIMS account to submit registrations, renewals, and other forms. Payments can be made online using KEIMS, over the phone, or by check through the mail.

New ASTs holding regulated substances must be approved by KDHE before installation, and those used for flammable or combustible liquids must also be approved by KSFMO. Owners must submit drawings and basic information including name, location, capacity, and dimensions of each tank; liquids to be stored; type of supports; and types and sizes of valves, etc. For tanks meant to hold flammable or combustible liquids, submit the provided forms to KSFMO with two sets of drawings. Once KSFMO approves the installation, it will send an approval letter to whomever submitted, and forward the other set of drawings to KDHE. If KDHE approves, it will then send an "Aboveground Storage Tank System Initial Registration Invoice" to the owner that must be returned with signature and fee payment. For non-flammable, non-combustible CERCLA liquids, simply submit drawings and "Kansas Department of Health and Environment, Application for Above Ground Storage Tank System Permit" to KDHE, who will then send the invoice if it approves the application.

ASTs are subject to federal spill prevention control and countermeasure (SPCC) regulations. As such, they may require secondary containment and an SPCC plan. Ultimately, you should contact EPA and KSFMO to determine your requirements.

Contact KDHE for appropriate forms if there is a change of ownership, if a tank is no longer in use or is removed, or if one or more tanks have been removed from service or brought back into service. The lower portion of the statement includes a "Certificate of Accuracy," which requires current owner and facility contact information. The owner should send one copy of the completed statement to KDHE with the registration fee payment and another copy to the local emergency planning committee as instructed on the registration renewal statement.

Chapter 3: Underground Storage Tanks – Permitting

Before installing a new tank or modifying an existing one, the contractor needs to obtain a permit for the work to be done. For installation, this involves submitting an application on a form provided by KDHE including plans, technical drawings, a list of parts, static water-level information, a description of the anchoring system used to prevent the tank floating, and the application fee of $100. Upon approval, the owner will receive an installation permit, which is valid for 120 days and allows for one delivery of product for testing the tank and line tightness.

> Any work performed on a UST system, whether installation, modification, testing or removal, requires a licensed contractor to certify the work to KDHE. Having the work done by someone without the correct license for the type of work will only cost you more money and time.

Once installation is complete, the owner and the contractor installing the tank must notify KDHE and verify compliance with the forms provided by the department. They must also submit documentation of financial responsibility for bodily injury and property damage due to releases from the UST system and the passing of corrosion-protection testing for metallic tanks or lines. KDHE will then issue a temporary operating permit. The owner must provide inventory control records and release detection reports for the first 90 days of operation in order to receive a regular UST operating permit.

New UST being lowered into a basin during installation

Before upgrading, modifying, or repairing a UST system, the owner must apply for a permit on forms provided by the department. Upgrades cannot begin until approved by KDHE in writing, but repairs that need to be made quickly for reasons of health, safety, or environmental concern may be initially requested over the phone. The form must still be submitted within 30 days of completing the repair, and it must include the name and title of the department representative who gave initial approval. The owner must keep documentation of any repairs or modifications for the life of the UST system. Additional documentation is required for repairs needed because of a release (see chapter 8).

Why do I need to register my tank?

Registration of USTs is legally required, but it also ensures the system is eligible for the trust fund. This fund can help cover costs related to corrective action in response to a release. For more information, see Chapter 11.

Be careful who works on your UST system — most work requires a contractor who is licensed in Kansas for the type of work done. Only a licensed contractor can install, remove, or repair UST systems. In general, any tasks that affect equipment in the dispenser cabinet or underground, other than filter changes, visual inspections, and basic cleaning procedures, should be done by a contractor. KDHE keeps an updated list of UST contractors who are licensed in Kansas on its website at www.kdheks.gov/tanks/download/currently_licensed_ust_installers_removers_tightness_testers.pdf.

Most of the work performed by a contractor includes documentation that must be sent to KDHE. If KDHE does not receive the required documentation, or if the certification comes from someone who is not licensed in the work done, the work will have to be redone and recertified by someone with the proper license. Don't risk wasting time and money on unlicensed contractor work.

Hiring a contractor who is licensed in the work you need done is critical — but what type of contractor do you need? A contractor can be licensed in installation, testing, and removal of UST systems, but some work requires the following specialized licensing:

- Cathodic protection
  - Installation
  - Testing
- Internal lining
  - Installation
  - Inspection via video camera
  - Inspection via entry
- Tightness testing
- Functionality check testing
- ASTM G158-98 integrity testing — assessing a tank before applying corrosion protection

What can an A/B operator do without a contractor?

- Clean spill buckets and ensure sumps are free of debris
- Change filters in dispensers
- Monitor for leaks via ATG, interstitial monitoring, etc.
- Check the amount of fuel and the amount of water in a tank using a stick, ATG, or both
- Maintain inventory control logs
- Perform any checks or visual inspections listed in the monthly and annual walk-through checklists required by KDHE

Chapter 4: Underground Parts of an Underground Storage Tank System

Tanks

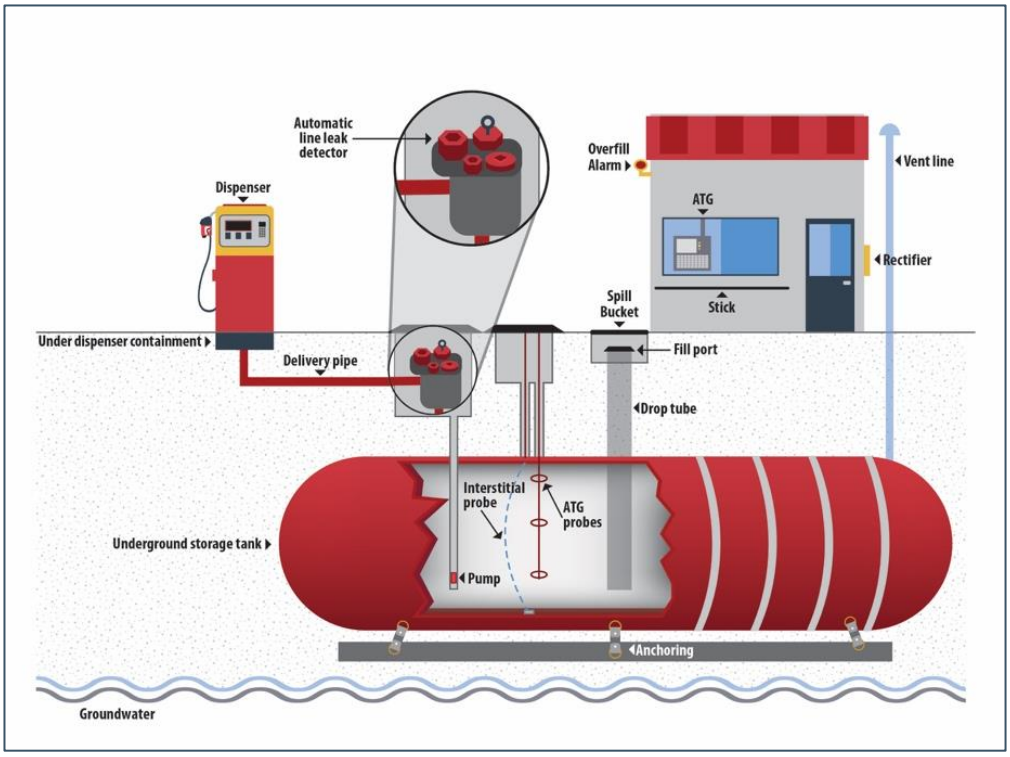


Diagram of an underground storage tank, or UST, system

Newly installed tanks can only be constructed of certain materials, and some of those materials have additional requirements to ensure the tank will not corrode, causing a release. **Fiberglass-reinforced plastic** can be used without additional corrosion protection for the tank itself because neither fiberglass nor plastic will corrode when exposed to moisture. If this type of tank requires repairs, they will need to be performed by an authorized representative of the manufacturer, or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory. **Steel** tanks must either be clad or jacketed with **non-corrodible material**, or be **cathodically protected** with one of the two types of cathodic protection systems - Sacrificial Anode or Impressed Current.

First of two tanks being secured to concrete deadman during installation

Some steel tanks were upgraded with an internal lining, but installing a new internal lining does not meet the requirement for corrosion protection anymore. If a tank has an internal lining, that lining must be inspected every five years. If at any point the lining is found to be damaged beyond adequate repair or is not performing properly, the tank must be permanently closed. Any installation, inspection, modification, or repair of internal lining or cathodic repair must be performed by a contractor who is licensed in Kansas for the type of work done.

Tank installation excavation showing shoring and bracing

Before installing corrosion protection, a tank will have to be evaluated for corrosion damage, unless the tank has been installed for less than 10 years and has been properly monitored for releases. Tanks that cannot meet the new construction requirements and cannot be upgraded or repaired to meet standards must be permanently closed.

Tank being anchored to concrete deadman (right side, bottom of the basin) using straps

Owners must now provide evidence their tanks are compatible with the substances stored, both for newly constructed and existing tanks.

All tanks installed after July 1, 2013, must have **secondary containment**, meaning they must be constructed with a second, external wall designed to contain releases caused by wear on the tank. They must also have **interstitial monitoring**, a system that detects product in the space between the two walls, which can indicate damage that may lead to a release. This can either be a dry system, which monitors for the presence of liquid in the secondary containment, or a wet system, in which the secondary containment is filled with a brine solution, and a sensor monitors for changes in the liquid level.

Though tanks are constructed of heavy materials, they have a large cavity which is rarely full, meaning a lot of empty space. As a result, if the water table is high enough, tanks can float, badly damaging the UST system and the surrounding area. Except in certain cases where it can be shown this is not a potential issue, USTs are required to have an **anchoring system**, typically a **concrete deadman**, to keep them buried.

Piping

As with the tanks, piping must be constructed of non-corrodible material or cathodically protected metal. The most common types of piping are **double-walled fiberglass**, and what is called **flexible non-metallic**, which do not have joints and are designed to be removed and replaced without breaking concrete.

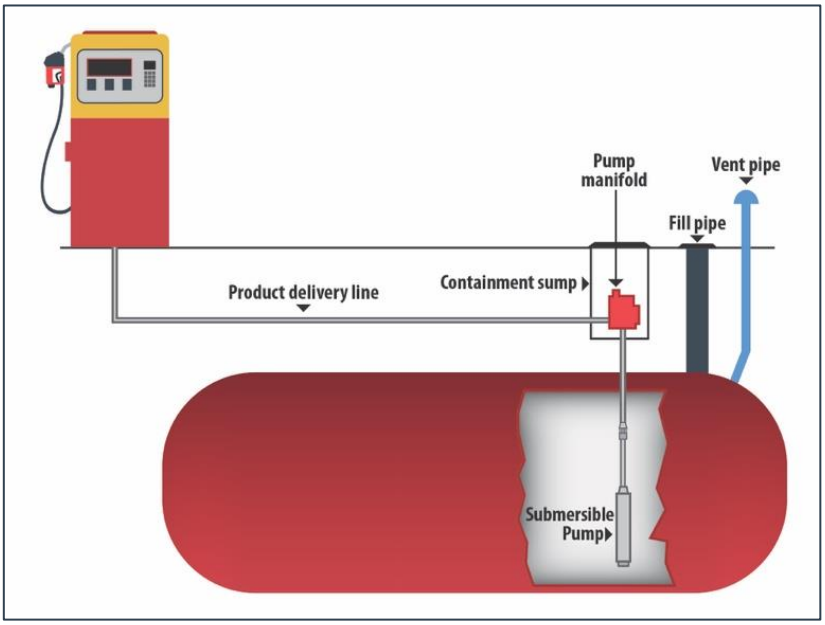


Diagram of a submersible turbine pump, or STP, system

Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced, and non-corrodible pipes and fittings must be replaced or repaired in accordance with

the manufacturer's specifications. Underground piping installed or replaced after April 1, 2016, must have secondary containment such as trench liners or double-walled pipe, and must use interstitial monitoring. If 50% or more of a piping run is replaced, then the whole run is considered needing to be replaced. So if half or more of a run of single-wall piping is replaced, then the entire run must be replaced with double-walled piping.

Example of an STP sump

There are two main types of fueling systems, and their use depends on the type of pump used: **submersible turbine pump**, or **STP**, and **suction-based**. The main difference between them is that STP systems move product by pressurizing the lines, as opposed to moving product by suction.

STP is the most common type used at about 95% of sites. The pump is typically positioned on top of the tank with its own secondary containment if the system is double walled, with the motor extended down into the tank. Pressurized piping for double walled systems must have secondary containment with interstitial monitoring and an **automatic line monitor (ALM)** or **mechanical leak detector (MLD)**. For single walled systems the release detection can be achieved by using an ALM, statistical inventory reconciliation (SIR), or annual line tests. Automatic line monitors (ALM) or Mechanical Leak Detectors (MLD) must be tested annually by simulating a leak.

> Tip: automatic line monitors alert the operator to possible leaks by restricting or shutting off flow, or through an audible or visible alarm. Do you know how your line monitor would alert you to a leak?

There are two types of suction systems: **Conventional (American)** and **Safe (European)**. One of the positive things about suctions systems is that if there is a line leak the system will simply fail to dispense product, indicating a problem with the system. Because of this, suction systems have fewer leak-detection requirements. However, suction is not usable in all situations because it is limited by the difference in height between the tank and the dispenser which limits how long the piping run can be. Conventional suction systems have a check valve at the top of the tank to prevent material from flowing from the dispenser into the tank. While this helps prevent contamination of the material in the tank, it also means some product is left in the piping above the tank. Safe suction systems have a check valve at the dispenser instead, and the piping slopes toward the tank, causing product to drain back into the tank from the lines. For a conventional suction system, the lines must be tightness tested every three years, but this is not required for safe suction systems.

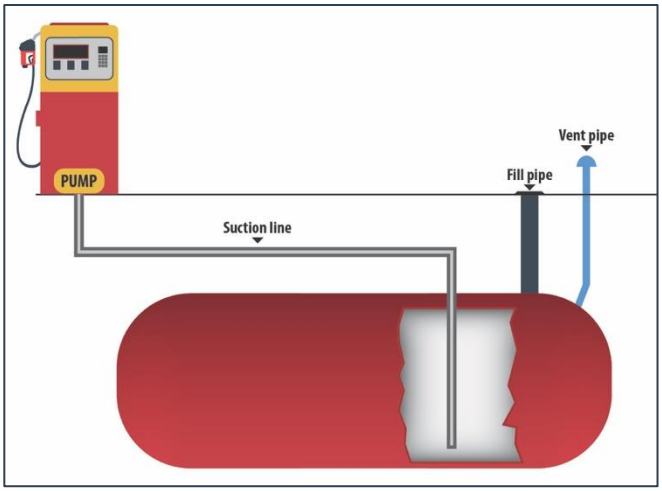


Diagram of a suction-based system

Connections

While traditional piping is held together with joints, UST systems generally use **flex connectors**, small hoses fitted to piping at either end. They are generally made of synthetic materials or braided stainless steel. These flex connectors may need to be protected from corrosion, which can be achieved by wrapping, placing a sleeve, booting, or adding cathodic protection.

Flex connector

Corrosion protection

USTs are constantly in contact with potentially moist soil, which can corrode metals over time, damaging UST systems and eventually causing a release. To avoid this, **corrosion protection** is required for tanks and piping constructed of metal.

Some tanks and piping are constructed with some form of corrosion protection built in by covering metal components with non-corrodible materials or simply avoiding use of corrodible materials. Some were constructed or upgraded with an internal lining. Tanks that were upgraded with an internal lining before 2007 still meet the current corrosion protection requirements, but this upgrade is no longer allowed, and future regulations may require owners to replace internally lined tanks. Internal lining must be inspected every five years, and any internally lined tank found to have damage to the lining beyond adequate repair must be permanently closed.

Example of corroded piping

However, the favored method for corrosion protection for metal tanks is **cathodic protection**. This works by one of two mechanisms. **Galvanic cathodic protection** redirects corrosive potential to another metal that corrodes more easily, called a sacrificial anode. These anodes have a limited operating life, and once they are consumed, they need to be replaced in order to continue protecting the system. **Impressed current** uses an electrical current, which

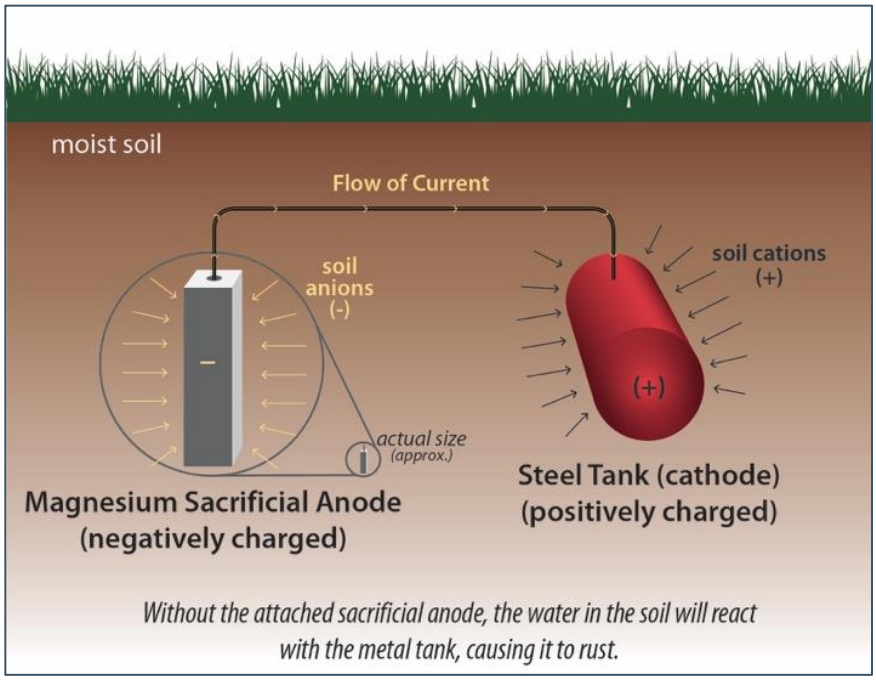


Diagram of galvanic cathodic protection

prevents the reaction that causes corrosion from taking place. This method uses a **rectifier**, which has a display to indicate its output. If the rectifier is reading zero, the cathodic protection system is not working to prevent corrosion. These systems are sensitive to power surges and may require maintenance afterward to ensure they are still functioning properly. Also, if the rectifier reading has not changed in a while, the rectifier may not be operating.

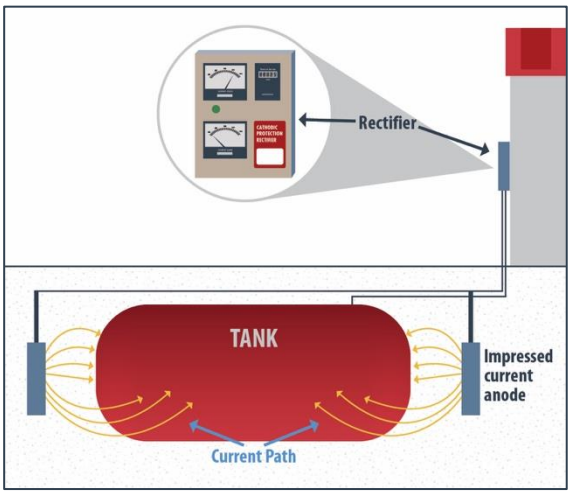


Diagram of impressed current cathodic protection


Example of a rectifier, which is part of an impressed current cathodic protection system

The owner or operator must maintain documentation of operation of any corrosion protection equipment in use. If a cathodic protection system needs repairs, it must be tested for proper operation within six months of the repairs. Cathodic protection systems must be tested within six months of installation and at least every three years afterward.

Containment sumps

Like tanks and piping, certain parts of the UST system have secondary containment. **Containment sumps** are used for parts other than tanks and piping. These sumps also serve as access points for some parts of the system such as connectors and certain release-detection equipment, e.g., interstitial monitoring. Typical containment sumps include **STP sumps, under dispenser containment sumps (UDC), transition sumps, spill buckets**, and in some cases, **intermediate sumps**.


Example of a containment sump, which houses the pump and equipment related to release detection

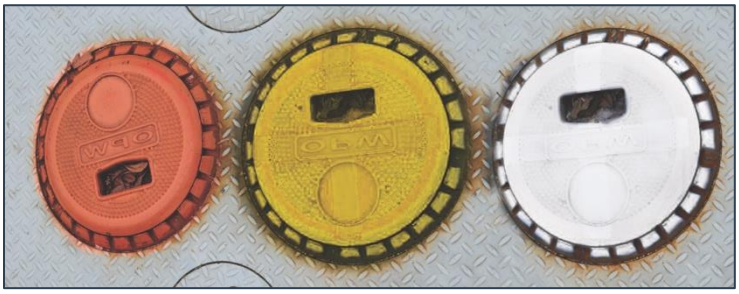
As the names suggest, the STP sump contains the submersible turbine pump, and the UDC sump is located under the dispenser to catch any leaks from dispensing equipment. Transition or intermediate sumps are less common and are typically used at transitions between underground and aboveground piping, or between different kinds of piping. STP sumps and spill buckets are found in the same area since both are directly above the tank, but STP sumps are much larger. A full double walled system is required for any new UST system installed after July 1, 2013.


Example of under dispenser containment, or UDC

If a double-walled system is in use, the containment areas must be inspected. Per the monthly walkthrough checklist, piping transition sumps must be visually inspected every 30 days and UDC and other containment sumps must be inspected annually, but it is recommended that UDC be inspected every 30 days. If the containment sump is not double-walled and cannot be inspected monthly, it must be tightness tested every three years.

Example of a spill bucket with label inside

Spill buckets serve as a barrier between USTs and the surrounding environment. They prevent water and debris from entering the tank, and they capture product spilled during delivery. The spill bucket houses the **fill port**, which connects to the drop tube. This is where the hose from the delivery truck will be attached to deliver fuel. The fill port should always be capped and the spill bucket covered with a lid unless a delivery is in progress. Spill buckets typically contain a drain or pumping system to move spilled product from the spill bucket into the tank. Drains are placed high in the spill bucket, near the level of the fuel port cap, so they only move product, not accumulated water and debris. If too much water or debris accumulates, it could still wind up in the tank, so keeping spill buckets clean and free of debris, and replacing damaged lids are critical.



Spill bucket lids color-coded according to API 1637. From left to right: Premium E10 gasoline (red), Ultra Low Sulfur Diesel ≤5% biodiesel (yellow), Regular E10 gasoline (white)

Since these are the main access points to the tanks, especially for delivery drivers, they must be clearly labeled with the type of fuel. This can be done using a marker inside the spill bucket or by color-coding the lids. While only one or the other is required, using both methods is highly recommended. It is best to mark spill bucket lids according to the code established in API 1637, but the most important thing is, regardless of what color coding is used, the code is posted and readily available to both operators and delivery drivers. It is also a good idea when color-coding the lids to paint a few inches beyond the edge of the lid. This way if a lid is damaged or lost, the port is still identified.

Example of a damaged spill bucket

Because containment sumps are access points, it is critical they be clean and in good repair, particularly the spill bucket since it is accessed so frequently. Regularly ensure it is free of water, product, and debris, and that all parts are intact. If the sump is double-walled, a monthly inspection as specified in the walk-through checklist is enough, but if not, it must be tightness tested

every three years. For UST systems in use on or before July 6, 2020, the initial test or inspection must take place before Oct. 13, 2021. Any containment sump undergoing repairs must be tightness- tested within 30 days of repair. Records related to repairs must be retained until the system is permanently closed or undergoes a change-in-service, and other inspection and testing records must be retained for three years.

Equipment Color-Symbol System: Part 1

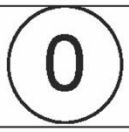
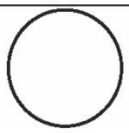
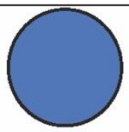
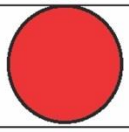
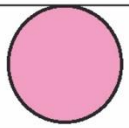
Product Category	Product Subcategory		Designation	Color	Symbol	Description	AMS #
Gasoline	E0/ conventional/ recreational fuel	Regular		White	Black 0	White with Black 0 and a collar or permanent label that states "Regular E0 gasoline"	N/A
		Midgrade		Blue	White 0	Blue with white zero and a collar or permanent label that states "Midgrade E0 gasoline"	AMS-STD 15056
		Premium		Red	White 0	Red with white zero and a collar or permanent label that states "Premium E0 gasoline"	AMS-STD 21105
	E10 ≤ 10% ethanol	Regular		White	None	White and a collar or permanent label that states "Regular E10 gasoline"	N/A
		Midgrade		Blue	None	Blue and a collar or permanent label that states "Midgrade E10 gasoline"	AMS-STD 15056
		Premium		Red	None	Red and a collar or permanent label that states "Premium E10 gasoline"	AMS-STD 21105
	Gasoline with alternative additives	Isobutanol blend 12.5 % - 16% Isobutyl alcohol		Blue	Yellow IB	"IB" yellow lettering on blue background and a collar or permanent label that states "Isobutanol Blend midgrade gasoline"	AMS-STD 15056 AMS-STD 23655
	Racing Fuel	E0		Pink	Black 0	Pink with Black 0 and a collar or permanent label that states "Regular Racing Fuel"	AMS-STD 31638
		up to 10% ethanol		Pink	None	Pink and a collar or permanent label that states "E10 Racing Fuel"	AMS-STD 31638

Figure 1 – Equipment Color Coding Symbol System (Part 1), reproduced courtesy of the American Petroleum Institute, API RP 1637, 4th Edition, April 2020

Equipment Color-Symbol System: Part 2

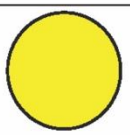
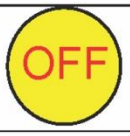
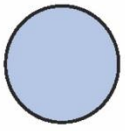
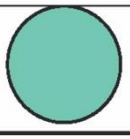
Product Category	Product Subcategory	Designation	Color	Symbol	Description	AMS #
Ethanol Blends	E15		Copper	E15-Black "E15"	E15-Copper with Black E15 and a collar or permanent label that states "E15"	AMS-STD 10075
	>15% ethanol		Copper	Black "EXX"	Copper with a Black EXX where "XX" is the E%, e.g., E20, and a collar or permanent label that states "EXX"	AMS-STD 10075
	E85		Copper	Black "E85"	Copper with Black E85 and a collar or permanent label that states "E85 fuel"	AMS-STD 10075
Diesel	On-Road (ULSD) ≤5% biodiesel		Yellow	None	Yellow and a collar or permanent label that states "On-Road ULSD ≤5% biodiesel"	AMS-STD 23655
	On-Road (ULSD) >5% biodiesel		Yellow	Black "BXX"	Various Grades: Yellow with a Black BXX where "XX" is the biodiesel %, e.g., B15, and a collar or permanent label that states "On-Road (ULSD) XX % biodiesel"	AMS-STD 23655
	Off-Road (dyed red) ≤5% biodiesel		Yellow	Red "OFF"	Yellow with Red OFF and a collar or permanent label that states "Off-Road (dyed red) ≤5% biodiesel"	AMS-STD 23655 AMS-STD 21105
	Off-Road (dyed red) > 5% biodiesel		Yellow	Red "OFF" Various Black "BXX"	Yellow with Red OFF and a Black BXX where "XX" is the biodiesel %, e.g., B15, and a collar or permanent label that states "Off-Road (dyed red) XX% biodiesel"	AMS-STD 23655 AMS-STD 21105
	Biodiesel - B100/B99.9		Light Blue	None	Light Blue and a collar or permanent label that states "Biodiesel - B100/B99.9"	AMS-STD 35450
	Renewable Diesel		Turquoise	None	Turquoise and a collar or permanent label that states "Renewable diesel"	AMS-STD 27769

Figure 2 – Equipment Color Coding Symbol System (Part 2), reproduced courtesy of the American Petroleum Institute, API RP 1637, 4th Edition, April 2020

Equipment Color-Symbol System: Part 3

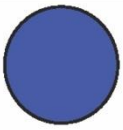
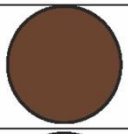
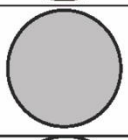
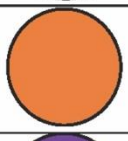
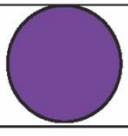
Product Category	Product Subcategory	Designation	Color	Symbol	Description	AMS #
Diesel Exhaust Fluid	Automotive-grade DEF (AUS 32, ARLA32)		Cobalt Blue	None	Cobalt blue and a permanent collar or label that states "Diesel Exhaust Fluid," "AUS 32", "ARLA32	AMS-STD 35056
	Marine-grade DEF (AUS 40)		Cobalt Blue	White "M"	Cobalt blue and a permanent collar or label that states "Marine - Diesel Exhaust Fluid" or "AUS 40"	AMS-STD 35056
Fuel Oil/ Heating Fuel	No. 1		Dark Green	Black "1"	Dark Green with Black 1 and a collar or permanent label that states "No. 1 Fuel Oil"	AMS-STD 14062
	No. 2		Dark Green	Black "2"	Dark Green with Black 2 and a collar or permanent label that states "No. 2 Fuel Oil"	AMS-STD 14062
	Biofuel oil		Dark Green	Various Grades: Black "B" followed by "2 digit %" and a 1 or 2 for fuel grade i.e. B15-1	Dark Green with a Black BXX-X where "XX" is the biofuel % and "X" is the fuel grade 1 or 2 and a collar or permanent label that states "XX% No. X Bio Fuel Oil"	AMS-STD 14062
	Kerosene		Brown	None	Brown and a collar or permanent label that states "Kerosene"	AMS-STD 10049
Other	Used oil		Light gray	None	Light gray and a collar or permanent label that states "used oil"	AMS-STD 16473
	Observation/Monitoring Wells		White	Black triangle	White with a black triangle in center	N/A
	Vapor Recovery		Orange		Orange and a collar or permanent label that states "vapor recovery"	AMS-STD 38903
	Denatured Ethanol		Purple	None	Purple and a collar or permanent label that states "Neat Ethanol"	AMS-STD 17100
NOTE Aerospace Material Specification (AMS) Standard 595A is available at http://ams-std-595-color.com.						

Figure 3 – Equipment Color Coding Symbol System (Part 3), reproduced courtesy of the American Petroleum Institute, API RP 1637, 4th Edition, April 2020

The port inside the spill bucket connects to a **drop tube**, through which product is delivered. The drop tube should extend far enough into the tank that the end is within one foot of the bottom of the tank and should always be clear of debris.

Observation tubes are located in the tank basin near the tank and can alert operators to a release. KDHE requires an observation tube for every 400 square feet of excavated area, rounded up. Ideally, observation tubes should contain water as long as water is present in the tank basin. In the event of a release, free product will be visible on the observation tube.

Compatibility

Not all components of UST systems are **compatible** with all regulated substances. Storing or dispensing substances using equipment not designed for them can damage the UST system, which can lead to a release. Owners or operators must now demonstrate any materials used in their systems in contact with regulated substances are compatible with the substance stored, including the tank or lining, piping, containment sumps, pumping equipment, release-detection equipment, spill equipment, and overfill equipment. This can be certified by the manufacturer or by a nationally recognized, independent testing laboratory. The owner or operator must also notify KDHE at least 30 days before switching to a regulated substance that contains more than 10% ethanol or more than 20% biodiesel. The owner or operator must maintain documentation their system is compatible with the substance stored.

Tanks containing biofuels or blends of biofuels are more susceptible to corrosion for two main reasons. Ethanol mixes with water differently than gasoline does. Very little water will dissolve in gasoline, so almost all water in a tank containing 100% gasoline will drop to the bottom. In this case, water is easy to detect, measure, and remove. Ethanol mixes easily with both gasoline and water. Gasoline containing ethanol will absorb more water without the water dropping to the bottom, and if there is enough water in the tank, the ethanol may begin to separate from the gasoline and form a layer on the bottom that is mostly ethanol with a significant amount of water. This exposes the bottom of the tank to a higher concentration of water than normal. It can also damage vehicles if this bottom layer is dispensed as fuel, so monitoring water levels is even more critical when storing ethanol blends.

Biofuels also encourage bacterial growth in a way that gasoline does not. However, this also applies to ultra-low-sulfur diesel, or ULSD, which is legally required for use in highway vehicles that run on diesel. Bacteria can feed on fumes of certain fuels and accumulate in the UST system, especially in vent pipes. These bacteria produce acids such as acetic acid, the acid found in vinegar, which corrode metal faster than water. Be aware of slow filling or dispensing; blue crystals forming on any part of the system; or odors of rotten eggs, vinegar, or rising bread as all can indicate bacterial growth.

Example of corrosion due to bacterial growth (image courtesy of Ed Haselwood)

Requirements for partial exclusions

Partially excluded tanks are not subject to all the requirements applied to USTs in general. As far as construction and installation, most categories of partially excluded systems are only required to be constructed in such a way as to prevent corrosion leading to releases and to be compatible with the substance stored. Partially excluded tanks are subject to the same requirements as other USTs regarding release reporting and response (see chapter 8) and financial responsibility (see chapter 10).

Field-constructed tanks and airport hydrant fuel distribution systems are largely subject to the same construction and installation requirements as other USTs, and these systems must be in compliance with these requirements by October 13, 2021. Though new installations and replacements of piping in UST systems are usually required to use double-walled piping, owners and operators are allowed to use single-walled piping when installing or replacing piping associated with UST systems with field-constructed tanks greater than 50,000 gallons, or airport hydrant systems.

Repairs and records

Additional testing may be necessary when a tank or portion of piping is repaired. This is not required if the portion of the UST system repaired is monitored monthly for releases. Otherwise, the portion repaired will require tightness testing, or if the portion repaired is a tank, an internal inspection can fulfill this requirement.

Any repair records must be retained until the system is permanently closed or undergoes a change-in-service. All records the owner or operator are required to maintain should ideally be kept on site and immediately available for inspection. Otherwise, records can be kept at an alternative site and provided for inspection to the department upon request.

Chapter 5: Release Detection and Regular Inspections

KDHE requires **release detection** for all tanks and piping except safe-suction piping. Release tests must be performed every 30 days. All release-detection methods must be third-party certified, and release-detection equipment must be tested for proper operation at least once a year.

A rainbow sheen on water generally indicates a spill or release.

What are my release-detection requirements?

Other than exceptions for manual tank gauging and deferred tanks, **inventory control, overfill protection, and monthly release tests** are required for all UST systems. Release-testing requirements can be met through use of an **automatic tank gauge**, or **ATG**, **statistical inventory reconciliation**, or **SIR**, or **interstitial monitoring**. **Manual tank gauging** is also acceptable for some smaller tanks. Vapor Monitoring only meets the requirement for deferred systems, and regular tightness testing no longer meets the requirement.

A UST system has several tools to help identify releases and potential for release when there is no observable or accessible issue, but don't forget to pay attention to your surroundings as well. Look for rainbow sheen on pavement or on water, or dead vegetation in the area, as these could be signs of a release. Remember to check your observation tubes for free product as well.

Automatic tank gauge

An ATG continuously checks the level of product in a tank. It can be used for monthly release-detection tests, tracking fuel levels for inventory control, water tests, and overfill control. However, not all ATGs perform all of these functions, and not all ATGs work in all types of fuel. ATGs test for leaks by analyzing fuel levels during periods of inactivity and looking for loss. Some ATGs can automatically gather data during inactive periods, but some require the tank be out of service for at least an hour to perform a release test. If product is lost when no one is dispensing fuel or otherwise interacting with the tank, that likely indicates a leak. Since an ATG analyzes the total fuel, it serves as release detection for the entire system.

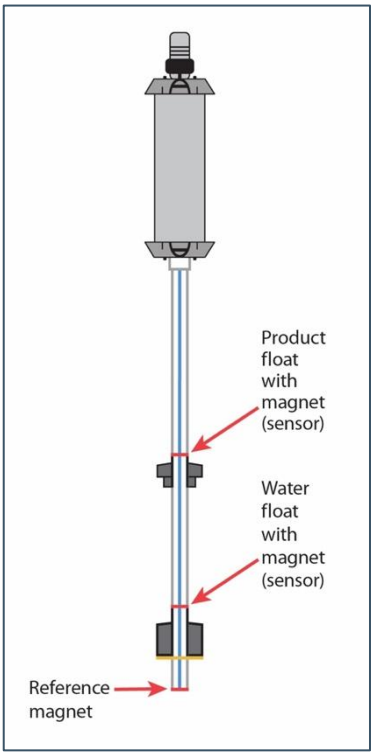


Diagram of an automatic tank gauge or ATG

A probe extends down into the tank with a float designed to sit at the top of the product layer. An electric impulse then indicates the level of fuel in

Example of an automatic tank gauge, or ATG

the tank. Some ATGs feature an additional float to indicate the level of water in the tank. An ATG must be programmed with the correct tank chart for the tank it monitors so it can convert the depth of fuel to volume. This should be programmed when the ATG is installed, but power surges can cause the ATG to lose programming, so you will want to check that it is still using the correct tank chart. An owner or operator may be able to check this and fix if necessary, but if you are not confident in your ability to do so, you may want to contact a contractor.

Scanning printouts from your ATG or taking pictures of them will help you maintain records, as the paper used in ATGs degrades easily.

Generally, performing a release test with an ATG is simple — it's a matter of pushing a few buttons, but for more detail, you will need to check your manufacturer's instructions. ATGs maintain records for a while, but you need to print a release-detection test at least once every 30 days, preferably twice a month or once a week. These printouts are not just proof you did not have a release — they are proof you were actively monitoring your system.

What to do with a failed/inconclusive test

If your ATG returns an inconclusive test, try it a few more times. Sometimes the contact points corrode over, and it takes a few tries to connect. An ATG may also return a failed or inconclusive result if the product level in the tank is low. However, if you consistently get a failed or inconclusive test with any release-detection method, you will need to take action. First, notify KDHE of the possible release. Then you will need a contractor to diagnose and repair the issue. Once the suspected issue is resolved, test again. If you still get a failing result, you will need to conduct a tank-tightness test. If the tank passes, continue trying to find and fix the issue, but if it still fails, you will need to contact KDHE about conducting a site assessment.

You must maintain records of these release tests for three years. Retaining the printouts is a good way to keep the results, but if you're going to use this method, it's best to copy them in some way by scanning or taking pictures of them, and keeping these records in a printed or digital file as a backup. These are printed out on the same thermal paper used for receipts, which does not survive well in heat, light, or moisture.

Annual testing of an ATG system for proper operation must include inspecting any probes or sensors for residual buildup; testing alarm operability and communication with controller; testing the alarm; verifying system configuration; testing the battery backup; and ensuring floats move freely, the shaft is not damaged, and cables are free of kinks and breaks.

Statistical inventory reconciliation

Statistical inventory reconciliation, or SIR, is a release-detection method that relies on your inventory control records. A vendor analyzes your inventory control records and determines whether you are likely to have had a release. Inventory control records are submitted to the vendor monthly, and must be processed and sent to the facility and to KDHE within 15 days of

the end of the month. SIR users who use an ATG for inventory control have the same testing requirements for their ATGs as facilities that use them for release detection.

You can use SIR whether you use an ATG or gauge your tank manually for inventory control, but you must still do your own inventory control and submit inventory control records to KDHE. While SIR is more accurate then inventory control, it is also slower. Unlike other release-detection methods that return results instantaneously, SIR can take weeks. If you use SIR, conducting your own inventory control, complete with calculating overs and shorts, is the best way to find major issues in real time, reducing the amount of product leaked into the environment in the case of an underground release.

Interstitial monitoring

Interstitial monitoring systems detect whether a product is present inside the secondary containment of a tank, run of piping, or other system component. This can be through a sensor that continuously monitors or through a simple manual test such as a dipstick that checks for product pooled in the lowest area, provided the secondary containment is designed for a dipstick. Interstitial monitoring of secondary containment is required on all tanks and piping installed on or after July 1, 2013. Remember, a whole system must have release detection, so interstitial monitoring only satisfies the requirement if the tank, any containment sumps, and all piping runs are monitored this way. If a sensor is used, it must be placed at the lowest point in the secondary containment in order to detect as small of a release as possible and catch it before it becomes a bigger problem.

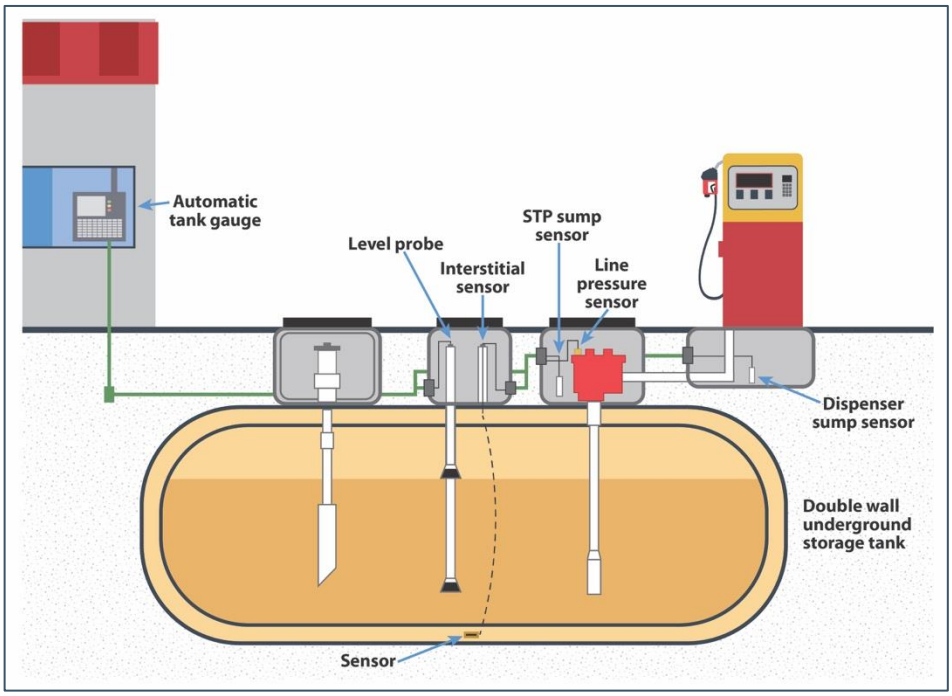


Diagram of an interstitial monitoring system

Facilities using interstitial monitoring must maintain a handwritten log of visual inspections of the console, including dates and any alarms noted, and the initials of the person inspecting. A record of alarm history and monthly status reports from the ATG must also be maintained. Installation records should be kept for at least five years, and any repair records should be kept for at least a year after completing the work. If secondary-containment areas of tanks and piping, or containment sumps, used for interstitial monitoring need repair, the area repaired must be tightness-tested within 30 days following the date of completion of the repair.

Annual testing of interstitial monitoring must include testing the alarm; verifying the system configuration; inspecting sensors for residual buildup; ensuring cables are free of kinks and breaks; testing communication with the controller; and verifying that vacuum pumps and pressure gauges, if present in the system, are functioning properly and communicating with the sensors and controller.

Manual tank gauging

Manual tank gauging may be used as the sole method of release detection for tanks with a capacity of 1,000 gallons or less, so long as a tank-tightness test is conducted no less than every three years. For tanks with a capacity of 2,000 gallons or less, but greater than 1,000, manual tank gauging may be used in place of inventory control.

Operator using a stick to gauge depth of product in tank

Manual tank gauging requires the tank to be undisturbed for a period of time determined based on size of the tank (see table below). A reading must be taken at the beginning and end of the period of inactivity. The final reading is then the average of the two readings taken. Make sure the stick used to gauge the tank is not bowed or warped; the end is intact, not worn away or cut; and it is marked-off legibly in increments of one-eighth of an inch. For further information on sticking a tank, see Inventory Control below. If weekly or monthly averages exceed the standards listed in the table below, this is considered a suspected release and should be reported as such.

REQUIRED RESTING PERIOD FOR MANUAL TANK GAUGING

Nominal tank capacity	Minimum duration of test	Weekly standard (one test)	Monthly standard (four-test average)
550 gallons or less	36 hours	10 gallons	5 gallons
551-1,000 gallons (when tank diameter is 64 inches)	44 hours	9 gallons	4 gallons
551-1,000 gallons (when tank diameter is 48 inches)	58 hours	12 gallons	6 gallons
551-1,000 gallons (also requires periodic tank- tightness testing)	36 hours	13 gallons	7 gallons
1,001-2,000 gallons (also requires periodic tank- tightness testing)	36 hours	26 gallons	13 gallons

Vapor monitoring

As of Oct. 13, 2021, vapor monitoring is only an acceptable method of release detection for airport hydrant systems and field-constructed tanks, in which case inventory control must also be conducted. This method uses sensors in special monitoring wells or a handheld device that is designed to detect product vapors in the event of a release.

Annual testing of vapor monitoring equipment should include verifying the system configuration of the controller; testing alarm operability and battery backup; inspecting sensors for residual buildup; and testing manual electronic devices. Hand-held equipment should also be tested for operability.

Overfill prevention

Another part of a UST system important for release prevention is **overfill prevention**, which works by one of the following:

- shutting off flow into a tank when it is 95% full
- restricting the flow into the tank either when it is 90% full or 30 minutes before overfill
- triggering an alarm when the tank is 90% full or one minute before overfill

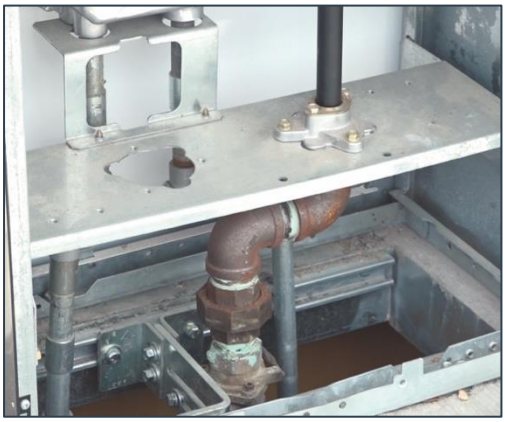
Example of an overfill alarm with attached emergency shutoff

The main methods used for overfill prevention are **automatic shut-off devices** and **overfill alarms**. Overfill alarms are connected to an ATG. Though ball valves had previously been an accepted form of overfill prevention, new installations of ball valves are no longer allowed and can only remain in use if proven to be effective.

Overfill-prevention equipment must be inspected at least once every three years, and must be inspected or tested within 30 days of any repair. For UST systems in use on or before July 6, 2020, initial inspections must take place by Oct. 13, 2021. Records related to repairs must be retained until the system is permanently closed or undergoes a change-in-service, and other inspection and testing records must be retained for three years.

Shear valves

Shear valves are critical for release prevention and safety. They are placed on the product line to the dispenser, and if the dispenser is damaged, such as by fire or collision from a car, the shear valve closes so that product is contained below the dispenser and will not be released as a result of the damage.



Example of a shear valve properly bracketed to concrete island

Inventory control

Inventory control is a process of comparing the measured amount of fuel in your tank to the amount of fuel you should have based on deliveries and the amount dispensed. Regular inventory control is required regardless of the release-detection method used. Readings must be taken and reconciled at least once every operating day. For UST systems that do not dispense regularly, readings should be taken at least once every 30 days. The water level should be checked and recorded at least once a month.

Regardless of what other release-detection methods you use, inventory control is a critical tool for finding releases and other issues. Unlike monthly release tests, inventory control can tell you quickly if you might have a release. It also allows you to see trends over time in a way other release-detection methods do not. This has helped facilities identify issues such as meters in need of calibration, poor practice in delivery, and even theft. Inventory control is the fastest and broadest diagnostic tool you have, and using it properly can save you time, effort, and money.

Sample excerpts are included on page 26 as examples of forms used for inventory control, but you will want to familiarize yourself with the forms used at your facility.

Fuel in a tank can be measured two ways. Many tanks are equipped with ATGs, which can give you the current level of fuel in your tank at the push of a button. Many ATGs are capable of measuring the water level in the tank as well. The other method is gauging manually, or sticking the tank. Even if you have an ATG, it's a good idea to keep a stick for gauging your tank. It allows you to check your ATG readings and continue performing inventory control if the ATG malfunctions, and it's best to check the water level in a tank by more than one method, especially if that tank contains an ethanol blend.

The fuel level in a tank should be checked once a day as well as before and after deliveries. Regardless of which method you use to measure the fuel level in your tank, it's best to measure at around the same time every day. Do not measure the fuel level while fuel is being added to or removed from the tank.

If you are manually gauging the fuel level, you will need a gauge stick made of non-sparking material such as varnished wood. The tip should be intact, and the stick should be marked to 1/8inch divisions and straight, not warped or bowed. For water tests, you will need water-finding paste, and fuel-finding paste is recommended when gauging your tank to give more accurate results.

To stick your tank, start by applying fuel paste if you are using it. Put it on a section of about six inches where you think the fuel level will be. Lower the stick slowly down the drop tube, and be consistent in which side of the drop tube you go down when sticking the tank. Gently touch the tip of the stick to the bottom of the tank, and then quickly remove the stick from the tank. Record the reading to the nearest 1/8-inch on the daily inventory sheet. The daily reading should be recorded under "end-stick inches." For further assistance, videos on properly sticking a tank are available on the KDHE and SBEAP websites.

For your monthly water test, you will use mostly the same procedure, except instead of applying fuel-finding paste around where you expect the fuel level to be, you will apply water-finding paste near the bottom of the stick. Make sure the water-finding paste you use is designed for your fuel blend. You may want to try a few different water-finding pastes, especially if you use an ethanol blend, as some are more accurate than others. Some water-finding pastes designed for ethanol are sensitive enough to moisture they may begin to change colors in humid air. If this happens, take the stick inside for a few minutes. Cooler, dryer air will allow some of the excess moisture to evaporate, turning the paste back to its original color except where it was actually exposed to liquid water.

The fuel level should be measured before and after delivery. This uses the same method to stick, but you will need to wait until five minutes after the delivery is finished to take your "after-delivery" reading. No fuel should be added or removed from the tank during this waiting period or while taking measurements, and no fuel should be dispensed during the delivery. Record the stick readings in "inches of fuel before delivery" and "inches of fuel after delivery."

At the same time you measure the fuel level for the day, you will need to record the amount of fuel dispensed. This can be done either by reading the totalizers in each dispenser fed by the tank or by printing a record from the cash register, if your system is set up to do so. If you use the sales report from the cash register, you will need to ensure no fuel is dispensed between

reading the fuel level in the tank and printing the sales report. Totalizers are located inside the dispenser cabinets. Be sure to read the totalizers for each dispenser that pulls from the tank.

Finally, you will need to record the amount of fuel delivered during the day, if any, based on drop tickets, or receipts from the delivery company. Be sure to keep these drop tickets — you must retain drop tickets for 12 months.

The amount of fuel dispensed is usually available on the point of sale.

Next you will need to convert your fuel measurements to gallons. If you are using an ATG, this is most likely done for you automatically. If not, you will need the tank chart for your tank. For each possible stick reading, this chart will have the volume of fuel in the tank in gallons. Convert your stick readings into gallons and record.

Subtract gallons of fuel before delivery from gallons of fuel after delivery to get gallons delivered (stick). Compare this to gross gallons delivered. These numbers should be close; if not, contact your supplier.

Next, you will need to copy some of the day's numbers over to the 30-day inventory record. The start-stick inventory (gallons) will always be the end-stick inventory (gallons) from the previous day. Record gallons delivered based on your stick readings, not the drop ticket, and record gallons pumped based on the sum of the totalizer readings. To get the book inventory for the day, take the start-stick inventory, add gallons delivered, and subtract gallons pumped. Next, record the end-stick inventory in both inches and gallons. Your daily over or short is the difference between the book inventory and the end-stick inventory. If the book inventory is higher, then the number will be negative (short), and if it is lower, the number will be positive (over). Initial the row for that day.

At the end of each 30-day period, you will need to calculate your changes over that period. First, you will need to calculate your leak-check number. Add together every day's gallons pumped for the 30-day period and drop the last two digits. Add 130 to this number to get your leak check. Add up the overs and shorts for the 30-day period, being careful of the positives and negatives, and compare this number to your leak check. If the net over or net short is higher than the leak-check number, circle yes; if it is lower, circle no. If "yes" is marked two months in a row, you will need to notify KDHE as soon as possible.

DAILY INVENTORY WORKSHEET

FACILITY NAME: LAST CHANCE #2 YOUR NAME: JON DOE DATE: 9/22/20

TANK IDENTIFICATION	1	2	3	4	
Type of Fuel	REG UNL	PREM UNL	DIESEL	MID UNL	
Tank Size in gallons	6,000	6,000	6,000	10,000	
END STICK INCHES	41 1/4	58 7/8	69	86 1/2	
AMOUNT PUMPED	↓	↓	↓	↓	↓
Totalizer Reading	24,383	30,798	92,485	44,013	
Totalizer Reading (5 more rows like this)	55,138	11,017			
TODAY'S SUM OF TOTALIZERS	79,521	41,815	162,663	82,987	
Previous Day's Sum of Totalizers	78,271	40,260	161,663	82,584	
AMOUNT PUMPED TODAY	1,250	1,555	1,000	403	
DELIVERY RECORD	↓	↓	↓	↓	↓
Inches of Fuel Before Delivery	13 7/8			49 7/8	
Gallons of Fuel Before Delivery (from tank chart)	537			5,246	
Inches of Fuel After Delivery	41 1/4			86 1/2	
Gallons of Fuel After Delivery (from tank chart)	2,672			9,423	
GALLONS DELIVERED (STICK) [Gallons "After" - Gallons "Before"]	2,135			4,177	
GROSS GALLONS DELIVERED (RECEIPT)	2,100			4,200	

MONTHLY INVENTORY RECORD

TANK IDENTIFICATION & TYPE OF FUEL: 4 MIDGRADE UNL MONTH/YEAR: 9/20

FACILITY NAME: LAST CHANCE #2 DATE OF WATER CHECK: 9/1 LEVEL OF WATER (INCHES): 0

DATE	START STICK INVENTORY (GALLONS)		GALLONS DELIVERED		GALLONS PUMPED		BOOK INVENTORY (GALLONS)	END STICK INVENTORY (INCHES)	(GALLONS)	DAILY OVER (+) OR SHORT (!) ["End" - "Book"]	INITIALS
1	3117	(+)	----	(-)	238	(=)	2879	31 1/8	2790	-89	JD
2	2790	(+)	6134	(-)	117	(=)	8807	80	8844	+37	JD
3	8844	(+)	----	(-)	127	(=)	8717	78 1/8	8732	+15	JD
4	8732	(+)	----	(-)	182	(=)	8550	77 1/2	8591	+41	JD
...31	7811	(+)	----	(-)	116	(=)	7695	68	7690	-5	JD
			TOTAL GALLONS PUMPED >		6594				TOTAL GALLONS OVER OR SHORT >	-74	

DROP THE LAST 2 DIGITS from the TOTAL GALLONS PUMPED number and enter the first numbers on the line below. Total Gallons Pumped amounts less than 100 gallons round to zero (0).

↑ COMPARE THESE NUMBERS ↓

***LEAK CHECK 65 + 130 = 195 gallons

Is "TOTAL GALLONS OVER OR SHORT" LARGER than "LEAK CHECK" result? YES (NO) (circle one)

If answer is YES for 2 MONTHS IN A ROW, notify KDHE as soon as possible. Call the district office or UST Program Staff in Topeka at 785 296-8061 KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR

Shortened example of completed daily and monthly inventory control worksheets

Walk-through checklist

KDHE now requires facilities to complete monthly and annual checks as part of regular walkthrough inspections. Though a facility may have a contractor perform these routine checks, one is not required for these, and they can be completed by an A/B operator or a C operator being overseen by an A/B operator. Owners and operators shall maintain records of operation and maintenance walk-through inspections for one year. Records shall include a list of each area checked, whether each area checked was acceptable or needed action taken, a description of actions taken to correct an issue, and delivery records if spill-prevention equipment is checked less frequently than every 30 days due to infrequent deliveries.

Monthly checks should be conducted no more than 30 days apart. Not all tasks on the checklist will apply because not all facilities have all the equipment mentioned, but those that apply to your facility are required. The walk-through checklist includes tasks already listed, such as monthly release detection checks, and some additional tasks:

Monthly checks

- Spill-prevention equipment — visually check for damage; remove liquid or debris; check for and remove obstructions in the fill pipe; check the fill cap to make sure it is securely on the fill pipe; and, 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 release-detection equipment is operating with no alarms or other unusual operating conditions present; and ensure records of release-detection testing are reviewed and current.
- If the system has impressed current cathodic protection - checked rectifier for normal operation and record Amps/ Volts/Hours if present, once every 30 days

Annual checks

- Containment sumps — visually check for damage, leaks to the containment area, or releases to the environment; remove liquid (in contained sumps) or debris; and, for double-walled sumps with interstitial monitoring, check for a leak in the interstitial area.
- Hand-held release-detection equipment — check devices such as tank gauge sticks or groundwater bailers for operability and serviceability.

Partial exclusions

Field-constructed tanks with a capacity of 50,000 gallons or less and other partially excluded tanks must meet the release-detection requirements described above. Field-constructed tanks with a capacity of greater than 50,000 gallons may use one of the above methods or certain modified versions. An ATG may be used that can detect a leak at one gallon per hour or less, combined with tank-tightness testing every three years, or an ATG detecting two gallons per hour or less can be used with tank-tightness testing every two years. The owner or operator can also use vapor monitoring for a tracer compound in the tank system, as long as vapor monitoring can detect a leak rate of 0.1 gallons per hour and is performed at least every two years. Alternatively, inventory control, performed in such a way as to detect a leak of 0.5% or less of flow-through (in accordance with Department of Defense Directive 4140.25; ATA Airport Fuel Facility Operations and Maintenance Guidance Manual) can be used when combined with either a tank-tightness test every two years that can detect a 0.5-gallon-per-hour leak rate or vapor monitoring conducted every 30 days.

Release detection for piping can be included in some of the options already mentioned. Vapor monitoring every two years or monthly with inventory control meets the requirement for release detection in piping with no need for modification. Inventory control with line-tightness testing at least every two years is also an option. Semiannual or annual line-tightness testing alone can meet the requirement as long as the system meets the following standards:

MAXIMUM LEAK-DETECTION RATE PER TEST-SECTION VOLUME

Test-section volume (gallons)	Semiannual test — leak-detection rate not to exceed (gallons per hour)	Annual test — leak-detection rate not to exceed (gallons per hour)
<50,000	1.0	0.5
≥50,000 to <75,000	1.5	0.75
≥75,000 to <100,000	2.0	1.0
≥100,000	3.0	1.5

Piping segments with a volume of 100,000 gallons or greater that cannot meet the maximum 3.0-gallon-per-hour leak rate for the semiannual test may be tested at a leak rate up to 6.0 gallons per hour according to the following schedule:

PHASE-IN TESTING FOR PIPING SEGMENTS ≥ 100,000 GALLONS IN VOLUME

First test	Not later than Oct. 13, 2021, and shall use up to 6.0-gallons-per-hour leak rate.
Second test	Between Oct. 13, 2021, and Oct. 13, 2024, and shall use up to 6.0-gallons-per-hour leak rate.
Third test	Between Oct. 13, 2024, and Oct. 13, 2025, and shall use 3.0- gallons-per-hour leak rate.
Subsequent tests	After Oct.13, 2025, begin using semi-annual or annual line testing according to the Maximum Leak-Detection Rate Per Test-Section Volume table found in 40 C.F.R. 280.252.

Walk-through inspections are required for any regulated UST system, with two additional items for airport hydrant systems. The hydrant pits must be checked visually for any damage or leaks, any liquid or debris should be removed, and hydrant piping vaults should be checked for piping leaks. These checks should be made monthly unless they require confined-space entry, in which case they should be made annually.

Record-keeping

The owner or operator must maintain records relating to multiple aspects of release detection. Any performance claims and their justification must be maintained for five years from the date of installation. These could include documentation from the manufacturer, or testing by the manufacturer or the contractor. If vapor monitoring is used, this includes records of the site assessment ensuring the requirements to use vapor monitoring are met. Records of site assessments developed after July 6, 2020 shall be signed by a professional engineer or professional geologist, or equivalent licensed professional with experience in environmental engineering, hydrogeology, or other relevant technical discipline that KDHE determines to be acceptable.

Results of annual operation tests must be maintained for three years and should

- list each component tested
- indicate whether each component tested was found to be in proper working order according to manufacturer's instructions or a code of practice developed by a nationally recognized association or independent testing laboratory, or needs to have action taken
- describe any action taken to correct an issue.

Results of tank-tightness testing, line-tightness testing, or vapor monitoring using a tracer compound must be retained until the next test of that kind is conducted. Written documentation of all calibration, maintenance, and repair of release-detection equipment permanently located on site shall be maintained for at least one year after the servicing work is completed. Any schedules of required calibration and maintenance provided by the release-detection equipment manufacturer shall be retained for five years from the date of installation. Results of any other sampling, testing, or monitoring must be maintained for at least one year.

Chapter 6: Aboveground parts of an Underground Storage Tank System

Dispenser

The **dispenser cabinet** houses several important components of a UST system, such as meters, filters, time delays, and calibration. The shear valve is usually placed at the bottom, just in the under-dispenser containment. Though there are few formal compliance requirements regarding dispensers, you should visually inspect your dispenser cabinets regularly to check for leaks in the under-dispenser containment.

Inside of a dispenser cabinet

Vent lines

UST systems are closed as much as possible, but they need to take in air as they are emptied, and release air during delivery to maintain pressure. Failure to maintain a relatively constant pressure can result in severe damage to the UST system or delivery trucks. USTs have **vent lines** attached, with pressure/vacuum valves at the other end to allow the tank to take in or release air as needed while remaining closed when the tank is not active.

Vent lines don't generally need much maintenance, but you should still visually inspect them regularly to check for damage. Holes in the piping allow vapor to vent freely rather than being contained by the valve at the end. Bacteria feed on vapors of certain types of fuel — most commonly ultra-low-sulfur diesel (ULSD) and ethanol. Obstructions in the vent lines can cause delivery or dispensing to be unusually slow.

Example of vent line positioned above awning

Vapor recovery

Delivering product to and dispensing it from tanks can allow vapors to escape into the air. **Vapor recovery** can greatly reduce the release of vapors into the air by capturing them and moving them back into either the delivery truck or the UST. **Stage I vapor recovery** is required for all gas stations, but **stage II** is only required in certain cities.

Stage I vapor recovery occurs while a UST is being filled. In most cases, one hose connects from the bottom of the tank to the port in the spill bucket to deliver product, while another hose connects a different port at the top of the tank to the top of the tanker.

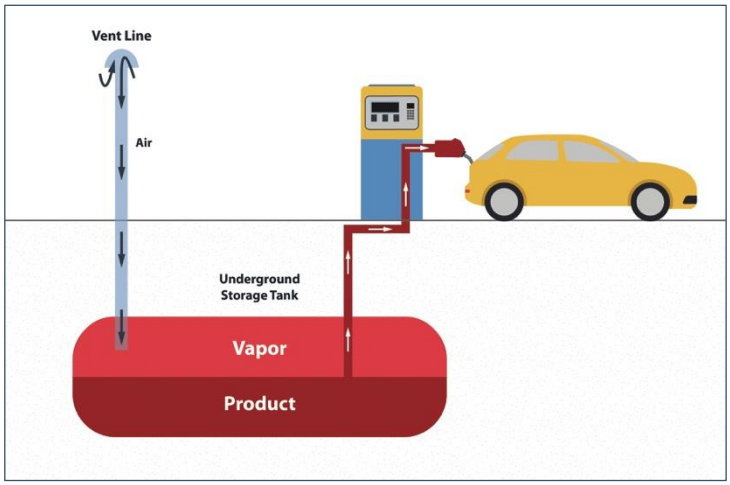


Diagram of the flow of vapor in a UST system

Otherwise, a coaxial vapor recovery system, which connects at one point and has hoses to both the bottom and the top of the tanker, may be used. The vapors from the tank are collected, compressed back into liquid, and added back to the tanker.

Product delivery using Stage I vapor recovery

Stage II uses a similar mechanism, but it collects vapors from the nozzle when fuel is being dispensed. A specially designed nozzle captures vapors, which are then fed back into the UST. Many sites were set up to install this under the assumption it would soon be a requirement. Since this never happened, some of these were never fully connected, and the piping installed to accommodate them is a source of water intrusion.

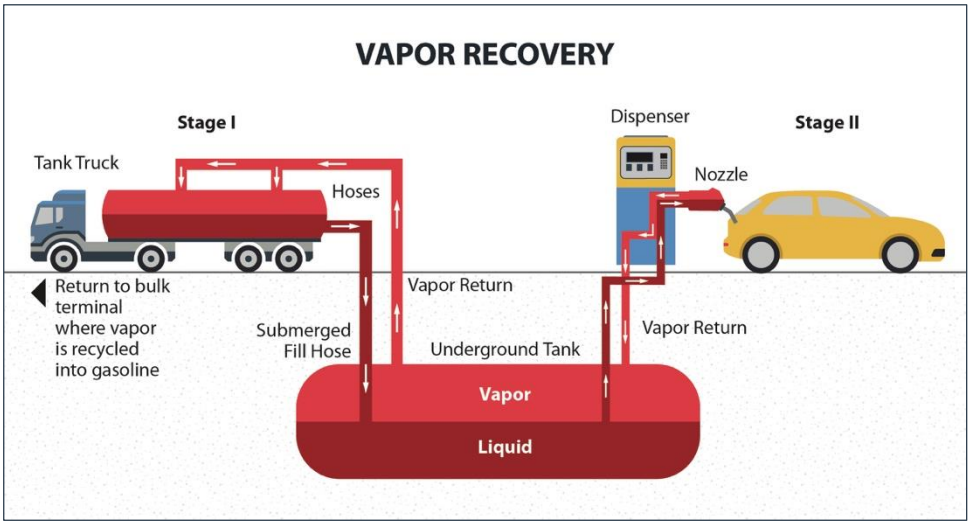


Diagram of stage I and stage II vapor recovery

Chapter 7: Operator Training

Technology has made UST system components more durable and made release detection easier and more accurate, but the management of any UST system is still only as good as the understanding of the operators. All UST systems must designate at least one Class A or Class B operator, and Class C operators as necessary, except for unmanned facilities, which have slightly different requirements. Operators must be trained within 30 days of assuming duties and must be retrained every four years, and Class C operators must be trained before they can be made responsible for responding to emergencies. KSFMO requires annual retraining on emergency procedures.

A Class A/B operator can be designated for up to seven facilities, which must be visited at least once a week. Designated Class A/B operators must be able to get to any of their facilities within four hours in the event of an emergency. These operators are responsible for training the Class C operators and providing them with written procedures for the following:

- Preventing overfill during delivery
- Operating emergency shut-off systems
- Responding to all alarms
- Reporting leaks, spills, or releases
- Performing any other emergency procedures for the facility
- Contacting necessary personnel in case of a leak, spill, release, or alarm

Class A operators are responsible for obtaining UST permits from KDHE and working with contractors during installations, repairs, and upgrades. They are typically owners or managers in large companies or governmental organizations, and are usually responsible for managing resources and work assignments to maintain compliance with regulations.

Class B operators are responsible for ensuring their facility's compliance on a day-to-day basis. They generally manage basic maintenance, operations, and record keeping. Specifically, they are responsible for overseeing release-detection reporting and inventory control.

Class C operators are responsible for the initial response to emergencies due to a spill or release from a UST system. These are generally the people overseeing the dispensing of regulated substances. At a minimum, Class C operators must understand response procedures for emergencies such as spills, overfill, or fire. Ideally, they should have a basic working knowledge of the different elements of a UST system including its function, location, and signs of malfunction. Anyone who may be responsible for responding to emergencies or overseeing the dispensing of product must be trained as a Class C operator.

Training for all three classes must be documented. Class A/B operators can attend in-person training or take an online course. Both options provide the operator with a certificate of training, which should at least document the name of the trainee, date of the training, class of the operator, and trainer or examiner's name, company, address, and phone number. Class C operators are trained by Class A/B operators. Records of classroom or field training, including training of a Class C operator by a Class A/B operator, should be signed by the trainer, and records of computer-based training should include the name of the training program and its web address, if internet based. Retraining records for Class A/B operators should document areas included in retraining.

Since they cannot practically be attended by a trained operator whenever in use, unmanned operations such as card-access facilities must instead post signs with critical information in case of problems. Unmanned facilities must clearly post emergency shut-off procedures; name, address, and phone number of the Class A/B operator; and name and phone number of local emergency responders, including 911 personnel.

Chapter 8: Release Reporting and Response

Releases from USTs can be difficult to contain. Aboveground releases can quickly lead to dead vegetation and contaminated surface waters, and petroleum products are particularly difficult to remove from soils and pavement. Underground releases are even harder to contain and correct, often requiring removal of contaminated soil, which can be time-consuming and costly. Fast responses to releases and suspected releases are critical.

Removal of a tank with evidence of external corrosion

What should I report?

Determining the extent of an underground release is a challenge, so KDHE requires all underground releases be reported. You also need to report if you have evidence of a release, even if you have not confirmed it. It will not cause a problem if it turns out you do not have a release, but waiting to confirm a release can mean more loss and more extensive cleanup.

Product on the ground, indicating a spill or release

Several things can indicate a possible release and need to be reported to KDHE as evidence of such. Finding free product on or near the site without a confirmed source (a spill), whether in the soil, in a basement, in sewer or utility lines, or on nearby surface water, indicates a release that needs to be addressed. Operators should also watch for unusual operating conditions such as erratic behavior of product-dispensing equipment, sudden loss of product, unexplained water in the tank, or liquid in the secondary containment. In these cases, the facility does not need to report to KDHE if the issue is found and is confirmed not to be releasing product, is immediately repaired or replaced, if an alarm was due to another cause such as a power surge or filling the tank during release-detection testing, or if any liquid found in the secondary containment that should not be there is fully contained and removed immediately.

Example of a spill kit typically used to clean spills related to USTs

Surface spills or overfills of 25 gallons or more, or those that cause a sheen on surface waters must be reported to KDHE. Accidentally dumping a gallon or two of product on pavement does not require a call to KDHE. For spills under 25 gallons that do not cause a sheen on surface waters, you can simply clean the spill yourself. In this case, the spill must be cleaned immediately, and if it cannot be cleaned within 24 hours, then KDHE must be notified.

When in doubt, report — if anyone is going to call KDHE, it's better if it's you.

WHAT DO I DO IF I HAVE A RELEASE?

IMMEDIATELY

• Prevent further release • Identify and mitigate hazards • Attempt to isolate the portion that is leaking

WITHIN 24 HOURS

• Report suspected or confirmed release to KDHE

From this point, KDHE will decide the timeline and what is required based on the nature of the release. This is a typical timeline, but not all responses will follow it.

WITHIN 7 DAYS

Perform tightness test, confirm whether a release occurred

Tightness test fails and a release is confirmed

Replace any faulty equipment

Immediately once release is confirmed:
• Initial Abatement
• Determine whether free products is present

WITHIN 20 DAYS

Submit report to KDHE with initial findings and abatement measures

WITHIN 45 DAYS

Submit report to KDHE detailing the nature and estimated quantity of the release and corrective actions taken, including removal of free product if found

Tightness test passes and there is evidence of environmental contamination

You will need a site check

Site check confirms release

Site check indicates no release has occured

No further action is required

Tightness test passes and there is no evidence of environmental contamination

No further action is required, though it would be best to investigate why you had evidence of a release

KDHE may require further investigation or corrective action, in which case the owner and operator will develop a corrective action plan and have it approved by KDHE.

UST releases should be reported to the Leaking Underground Storage Tank Unit at 785-296-6768 or to the appropriate district office for your area.

Spills of 25 gallons or more, or those that cause a sheen on water, should be reported to 785-296-1679. When in doubt, report-- it's better to call KDHE than to have someone call them about you.

How to respond

The first priority is to keep people safe. Call 911 if there is a fire or if anyone has been injured.

Call KDHE — have as much of the following information as possible:

- Name, address, phone number of person in charge of the site, and of the owner or operator
- Date, time, location
- Duration of the spill or release
- Source and cause of the spill or release
- Description of the event, including product
- Type of product released
- Estimated volume of the spill or release
- Any actions taken to mitigate damage from the spill or release

If you are not the A/B operator, call the A/B operator responsible for your site. Contact information should be easily available.

Suspected releases

All suspected or confirmed releases must be reported to KDHE within 24 hours. The owner or operators must also take immediate action to prevent any further release of a regulated substance into the environment, and must identify and mitigate fire, explosion, and vapor hazards. You will need to isolate the portion of the system you think is leaking. Some of these procedures may require a contractor, but on-site personnel should take steps such as bagging a faulty dispenser to indicate it is out of order, stopping fuel flow to equipment that is releasing product, or refusing delivery if a tank or product piping may be leaking.

For a suspected release, you will then need to perform a tightness test on the portion of the system suspected to be leaking. A Kansas-licensed contractor must perform any tightness testing and submit the required paperwork to KDHE. All suspected releases must be investigated, and the owner or operator must confirm whether a release occurred and notify KDHE within seven days.

If testing does not indicate a release occurred, and no environmental contamination was observed, then no further investigation is required, though you should try to find out why you had evidence of a release — for example, if the release detection failed, you will want to ensure your release-detection system is functioning properly. If testing does not indicate a release occurred, but a release was suspected because of environmental contamination such as dead vegetation, free product on groundwater, or vapors found off site, then you will need to proceed to a site check. If results of the site check indicate no release has occurred, then no further action is required. If the test fails, you will need to have any faulty equipment repaired or replaced. If the failing equipment does not meet new standards (for example, piping without secondary containment), you may need to upgrade the system. If you cannot bring it into compliance by repairing, replacing, or upgrading equipment, the UST will have to be closed.

Confirmed releases — initial abatement

Once a release is confirmed, owners and operators must begin initial abatement measures to reduce and reverse environmental harm as much as possible. First, they must remove as much

of the regulated substance as they need to in order to prevent further release to the environment. For operators, this will usually consist of soaking up released product using spill pads and sorbents, and possibly using a boom to contain free product on water. They will need to visually inspect any aboveground releases or exposed belowground releases, and prevent the released substance from moving further into the soil or groundwater. The owner or operator will need to continue monitoring any hazards resulting from vapors or contaminated soil such as explosion hazards, inhalation, and further environmental damage, and must solve these issues as is possible, e.g., by removing contaminated soils. If you do need to treat or dispose of soils, be sure to check any state or local requirements.

Example of initial abatement: use of booms and spill pads to contain a spill

The owner and operator will need to continue assessing presence of product on the site by sampling and measuring as necessary. They will also need to investigate to determine whether or not free product may be present, and if so, begin free-product removal as soon as possible. A report must be sent to KDHE detailing these steps and initial findings within 20 days of confirming the release. Owners and operators should also start assembling data on the nature and estimated quantity of release. A report of these additional findings and corrective actions should be submitted to KDHE within 45 days.

If there is evidence of possible groundwater contamination or free product that needs to be removed, the owners and operators will need to investigate further. KDHE can also request this investigation in writing. This information must be submitted to KDHE as soon as practicable or on a schedule determined by KDHE in writing.

Any free product, including contaminated soils, must be removed and disposed. Within 45 days of confirming the release, a report must be submitted to KDHE describing any free product observed and the measures taken to remove and dispose of it.

If additional action is needed to treat or remove contaminated soil or groundwater, or to avoid further contamination, the owners and operators must develop a **corrective action plan** and have it approved by KDHE. Corrective action, including cleanup, includes action taken beyond initial abatement such as more involved remedial action. Owners and operators can determine on their own this is necessary for their site based on their investigation, or KDHE can notify them in writing when it is required.

For each release that requires a corrective action plan, KDHE will distribute a public notice, designed to reach those most directly affected by the release, and the planned corrective action. Before approving a corrective action plan, KDHE may hold a public meeting for comments on the proposed plan if there is enough public interest, or if KDHE decides it is necessary for some other reason. Members of the public may obtain site-release information and decisions

concerning the corrective action plan by requesting them from KDHE. The public will also be notified if an approved corrective action plan does not achieve the intended results.

KDHE may modify the plan before approval. The owners and operators must then monitor, evaluate, and report results of implementing the plan in accordance with a schedule and in a format established by the department in writing.

In order for the cleanup process to be faster and more effective, owners and operators may begin cleanup before receiving approval, as long as they notify KDHE of their intention to do so; comply with any conditions imposed by the department in writing, which may include stopping or modifying initial cleanup activities; and incorporate these self-initiated cleanup measures in the corrective action plan that is submitted to the department for approval. Otherwise, owners and operators must wait for KDHE’s approval before they can begin cleanup procedures.

Chapter 9: Renewals, Change in Service, Change of Ownership, and Closures

Renewals

All USTs must be registered with KDHE and have valid permits. Permits are valid from Aug. 1 to July 31 of every year, and renewal notices are sent around March 15. Owners must review their renewal notices, make any necessary changes, and return them to KDHE with payment of a $25 per tank fee by April 30. Failure to renew by April 30 will result in a late fee of $50 per tank, and an additional $100 per tank will be charged for renewals submitted on or after Aug. 1. KDHE will not issue permits for non-compliant tanks. If you do not receive a permit by the end of June, and you do not receive a letter explaining why, contact KDHE.

Why do I need a permit for my tank?

Vendors cannot legally deliver product to a tank that does not have a permit posted, so failure to renew a permit could cause serious disruption to your business. Permitting also qualifies your tanks for the Kansas State Petroleum Trust Fund.

Renewals, permits, and other forms can now be submitted online. Facilities have accounts in KEIMS, KDHE's database for permitting and other environmental requirements and reports. Property and tank owners and operators can sign up as users, as well as contractors, consultants, businesses, facility operators, entities receiving grant funding or technical assistance, and others, allowing multiple people to submit forms and reports according to their roles. Owners and operators can also pay fees using the KEIMS portal as well as via check or by credit card over the phone. For more information or to access KEIMS, go to kdheks.gov/ber/keims.html.

Change of ownership

When a UST changes hands, the **change of ownership** must be reflected in the permit. You would not want to be liable for a tank someone else is operating, nor would you want to find yourself unable to renew the permit because it was not in your name. The original owner must submit a transfer-of-permit form to KDHE at least seven days before transfer of ownership or operational responsibility, signed and notarized, with applicable fees. This must include a copy of a legal document showing ownership transfer such as a warranty deed, real estate contract, bill of sale, or certificate of merger. Note that these documents become public record, but you can obscure the sale price before submitting if you wish. The new owner will also have to submit the following:

- Certificate of third-party liability insurance
- Release-detection methods to be used
- Results of any required tightness or corrosion testing of the tank or lines or function test
- A/B operator training certification
    - New operators should be certified as soon as possible as it is required within 30 days.

KDHE will not process the transfer until all of these documents are received. Failure to submit all documents within 30 days may result in a fine or other penalty.

Temporary closure

If an owner chooses to stop operating a permitted UST but does not want to permanently remove it from service, there is the option to **remove it from service temporarily**. This is usually done to give the owner or operator time to bring the tank into compliance, e.g., through repairs or upgrades. The owner of a tank in temporary closure is still required to maintain financial responsibility, operate corrosion protection and release detection, and pay annual registration fees. In order to change the status of a tank to temporarily out of service, the owner must take these steps:

- Notify KDHE in writing of the status change
- Notify insurance of the change and that the tank will not be storing hazardous materials during this time
- Secure access to the tank via locks on dispensers, spill buckets, etc.

If a tank is temporarily closed for three months or more, the owner or operator must also leave vent lines open and functioning, and cap and secure all other lines, pumps, manways, and ancillary equipment.

A tank in temporary closure must be in compliance with standards, except those pertaining to spill and overfill prevention, within 12 months. If it is not in compliance by this time, the owner or operator can request an extension of 12 months, but if the tank is not in compliance by the end of this period, the tank must be permanently closed and removed. A site assessment is required before an owner or operator can apply for a 12-month extension. Before returning a temporarily-out-of-service tank to service, KDHE may require testing of lines, tanks, release detection, or cathodic protection.

UST being removed from service

Permanent closure and change-in-service

If a tank can no longer meet the requirements for storage of regulated substances, it must either be closed or undergo a **change-in-service**, meaning it can be used to store non-regulated substances. KDHE must be notified at least 30 days before a tank is permanently closed or before a change-in-service, unless the action is related to corrective action. Any liquids and accumulated sludges must be removed.

When **permanently removing a tank from service**, the owner must either remove the tank or **abandon it in place**, meaning it is filled with inert material and left in place. Both methods require a site assessment. For a tank removal, KDHE field staff may be able to conduct a site assessment at no cost to the owner, given adequate notice. If the site assessment finds contaminated soils, contaminated groundwater, or free product as a liquid or vapor, corrective action is required. Abandonment in place requires a Phase II site assessment, for which the owner will need to hire an environmental professional. Closure by removal or by filling with inert material requires a licensed contractor, who must submit the completed permanent-tank-abandonment form to KDHE within 15 days of permanently closing the tank.

Closure records, such as those relating to site assessments and contractor work, must be maintained for at least three years by the owners and operators who removed the UST from service, the current owners and operators, or by KDHE, after submittal via mail if the records cannot be kept at the site. KDHE prefers owners retain these records for at least five years, and it is good practice for owners to keep them permanently to protect from liability in future developments.

KDHE can request, in writing, the owner and operator of a UST system with field-constructed tanks or an airport hydrant system permanently closed before July 6, 2020 assess the excavation zone and follow the closure procedure outlined above, if they determine a release from the UST poses a current or potential threat to human health and the environment.

Chapter 10: Financial Responsibility

UST owners are required to demonstrate **financial responsibility**, meaning they are capable of covering costs related to corrective action needed in response to a release, compensating third parties for bodily injury and property damage caused by sudden or accidental release, and compensating third parties for bodily injury and property damage caused by non-sudden accidental releases. Some costs associated with corrective action may be covered by the Kansas Petroleum Storage Tank Release Trust Fund, but not all, and third-party claims are not covered by the trust fund. State and federal government entities whose debts and liabilities are the debts and liabilities of a state are exempt from this requirement.

Insurance coverage for **third party liability**, in compliance with the Kansas Storage Tank Act, can be arranged through your current insurance agent. Your agent should contact the servicing carrier through its representative. Note these assurances exclude legal defense costs and do not limit the liability of the owner or operator. If the owner and operator are not the same person, only one of them needs to demonstrate financial responsibility, but both are liable for noncompliance.

The amount of coverage required for corrective action and third-party claims depends on the amount of fuel pumped from the UST system each month. Owners or operators who pump an average of more than 10,000 gallons a month based on annual throughput from the previous calendar year must carry at least $1,000,000 of coverage per occurrence, and those who pump an average of less than 10,000 gallons a month must carry at least $500,000 of coverage per occurrence. For owners or operators of multiple tanks, the number of tanks for which they are financially responsible is also a factor. Those responsible for one to 100 tanks must carry aggregate coverage of at least $1,000,000, and those responsible for 101 or more tanks must carry coverage of at least $2,000,000. Though UST often refers to an entire system that may contain multiple tanks, financial responsibility is determined based on the number of individual containment units, not connected systems.

An owner or operator may use different mechanisms to cover different portions of financial responsibility, but the mechanism or combination of mechanisms for each of the types of costs covered (corrective action, third party claims for sudden release, and third-party claims for non-sudden release) must meet the minimum requirement for the tank or group of tanks. For example, if an owner of more than 100 tanks uses one mechanism to cover corrective action for all of them, and a different mechanism to cover third party claims for all of them, each of those mechanisms still has to cover $2,000,000.

However, if a single owner or operator of multiple tanks has different mechanisms for different tanks, the aggregate financial responsibility is determined by the number of tanks covered by the mechanism. For example, if an owner has one tank with an average monthly throughput of less than 10,000 gallons covered entirely by one mechanism, and six tanks covered by another mechanism, the financial responsibility that must be covered by the first mechanism is $500,000, and by the second mechanism is $1,000,000, leaving that owner with a total financial responsibility of $1,500,000.

Mechanisms for demonstrating financial responsibility

Besides the third-party liability insurance discussed previously, owners of USTs can use any of the alternative mechanisms listed in K.A.R. 28-44-27 to cover third party claims for personal injury and bodily injury:

- Financial test of self insurance — based on the net worth of the owner, operator, and/or guarantor
- Guarantee — based on the net worth of a guarantor
- Insurance and risk retention group coverage — a separate insurance policy or an endorsement to an existing insurance policy
- Surety bond
- Letter of credit
- Trust fund (no relation to Petroleum Storage Tank Release Trust Fund)
- Standby trust fund

Local government UST owners and operators may use any of the mechanisms described above or any of the following:

- Local government bond rating test
- Local government financial test
- Local government guarantee
- Local government fund

Chapter 11: Kansas Petroleum Storage Tank Release Trust Fund

The Storage Tank Act establishes two separate trust funds to assist owners and operators of storage tanks with the cost of remedial actions. Both funds are designed to provide financial assistance to owners and operators of facilities where contamination from petroleum storage tanks has occurred. The trust funds are financed from a $.01 fee placed on each gallon of petroleum (except aviation fuel) product manufactured in or imported into the state. Outlined below is a brief summary of the program.

Who qualifies for reimbursement from the state trust fund

- Owners or operators of underground and aboveground storage tanks; and private businesses, and local and state governments who own/operate petroleum storage tanks are eligible.
- To be eligible, contamination at the site must have been discovered on or after Dec. 22, 1988.
- Owners or operators of farm or residential tanks of 1,100 gallons or less, and tanks used to store heating oil at a single-family residence may qualify for reimbursement

Who does not qualify for reimbursement

- The federal government
- Owners or operators who meet the federal criteria for self-insurance, and whose leaking tank is located on a facility that is engaged in the refining or production of petroleum
- Owners or operators who knowingly allow a release of petroleum to occur, or who do not cooperate in conducting the appropriate corrective action
- Owners or operators of storage tanks at pipeline facilities where releases have occurred

How to obtain reimbursement from the state trust funds:

- Submit an application for assistance from the appropriate fund.
- KDHE trust fund staff will prepare and provide the owner with a pre-approved corrective action plan at a time determined by the priority ranking system. The work-scope will be prepared to assist the owner or operator in obtaining the required competitive bids.
- Three bids for all work associated with the remedial action must be obtained and approved in writing by KDHE trust fund staff prior to the work being conducted.
- KDHE offers a bid-assistance program for those who prefer to have KDHE obtain bids for them.
- The applicant must sign a consent agreement with KDHE related to implementation of the corrective action under the applicable fund.

Compliance requirements:
All regulated storage tanks must be registered with KDHE and must be in compliance with inventory control, release-detection, and release-reporting requirements. Failure of a UST facility to comply with any of these requirements at the time they are approved for trust fund assistance may result in fines, though these issues can also result in a fine or other penalty at any other time as well through enforcement. Note that a facility can face fines associated with the trust fund and enforcement actions for the same issue—incurring a fine through the trust fund does not mean that the facility cannot face enforcement actions. Storage tank owners or operators who are not in compliance upon approval for trust fund assistance will be fined based upon the following:

- Failure to register storage tanks: $50.00 per tank
- Failure to maintain inventory control: $300.00 per tank (first violation)
- Failure to perform release detection: $2,000.00 per tank, $250.00 per line system
- Failure to immediately (within 24 hours) report a release: $2,500.00 per release
- Failure to cooperate with KDHE directives: $2,500.00 per site
- Operating STs without a permit: $2,000.00 per site
- Failure to provide financial responsibility (third party liability coverage) for underground storage tanks: $500 per UST

Petroleum storage tank release trust fund site ranking system:
Due to the overwhelming number of applications for assistance from the funds, KDHE has developed a ranking system that evaluates the risk associated with each site. This ranking system takes into account several factors related to each site to determine which sites pose the greatest risk to the public. Using the ranking system, KDHE assigns a score to each site. This score will establish the order in which sites are investigated and remediated. By using this method, KDHE can focus limited resources on resolving the greatest risks to the public.

Costs covered by state trust funds include the following:
(Cost must be pre-approved in writing by KDHE trust fund staff prior to the start of work.)

- Preparation of corrective action plans that address the extent of contamination
- Investigation and assessment of the contamination or petroleum release
- Disposal and treatment of contaminated soil, groundwater, and/or surface water
- Removal of contaminants from soil, groundwater, and/or surface water
- Monitoring of the soil, groundwater, and/or surface water, and maintenance of the monitoring equipment
- Restoration or replacement of public water supplies

Costs not covered by state trust funds include the following:

- Repair, removal, replacement, or disposal of tanks, product in tanks, lines, or dispensers
- Costs for the loss of business or costs for third party bodily injury or property damage
- Work or costs not approved in writing by KDHE trust fund staff prior to the work being conducted

Deductibles
The deductible for each release is $3,000 plus $500 for each tank (above and below ground) located at the site of the release.

Financial limitations of trust funds

- For each petroleum release: $2,000,000, minus the deductible.
- For owners or operators who own less than 100 tanks: a total annual amount of $1,000,000 for all sites owned or operated, minus any deductibles.
- For owners or operators who own more than 100 tanks: a total annual amount of $2,000,000 for all sites owned or operated, minus any deductibles.
- Reimbursement will not be provided for costs covered by insurance policies, warranties, or other financial assistance.

Summary of Inspection and Record-Keeping Requirements

REGULAR TESTING AND INSPECTIONS			
	Requirement	**Timing**	**Records**
Cathodic protection	Test	Every three years	Five years
Internal lining	Inspection	Every 5 years	Five years
Pressurized piping (if monthly release detection is not in use for piping)	Tightness testing	Annually	Until next test
Conventional suction piping (if monthly release detection is not in use for piping)	Line tightness testing	Every three years	Until next test
Containment sumps	If not double-walled and inspected as part of monthly walk-through — tightness testing	Every three years	Until next test
Automatic line-leak detector	Test by simulating a leak	Annually	One year
Release detection	Test for proper operation	Annually	Three years
	Monitor for releases	Monthly (submit SIR to KDHE monthly, other forms annually)	Three years
ATG	Maintain record of alarms, monthly status reports	Continuous	One year
Interstitial monitoring	Maintain log of inspections, alarms, etc.	Continuous	One year
Vapor monitoring using a tracer compound*	Test for release	Every two years	Until next test
Inventory control	Record and reconcile	Record every operating day, reconcile every 30 days, submit annually	One year (three is recommended)
	Water test	Monthly	
Overfill prevention equipment	Inspection	Every three years	Three years
Walk-through inspection	All applicable tasks	Monthly or annual, according to checklist	One year
Pump meters	Calibrate	Annual	One year

**Only an acceptable form of release detection for field-constructed tanks with a capacity of greater than 50,000 gallons.*

REPAIRS			
	Requirement	**Timing**	**Records**
Cathodic protection	Test	Within six months	Retain last records of last three inspections
Containment sumps	Tightness test	Within 30 days	Three years
Overfill prevention equipment	Inspection or test	Within 30 days	Until permanent closure or change in service
Tank	Tightness test or internal inspections	Within 30 days (not required if monthly release detection is in use or tank is internally inspected)	Until next test
Piping	Tightness test	Within 30 days (not required if monthly release detection is in use)	Until next test
Release-detection equipment	Maintain records (for all calibration, maintenance, and repairs)	N/A	One year
Any other upgrade and repair records must be kept for the life of the UST system.			

INSTALLATION			
	Requirement	**Timing**	**Records**
Cathodic protection	Test	Within six months	Retain records of last three inspections
Release-detection equipment	Maintain records	N/A	Five years

TRAINING			
	Requirement	**Timing**	**Records**
UST operator training (all classes)	Retrain	Every four years	As long as the individual is operating the UST
Emergency procedure training	Retrain	Annually	As long as the individual is operating the UST

OTHER RECORDS TO RETAIN	
Records	**Timing**
Metal tanks or piping without corrosion protection – documentation of a corrosion expert's findings for the site	Life of the UST system
Rectifier readings	One year
Release detection –- performance claims and justification	Five years from the date of installation
Vapor monitoring – records of site assessment verifying conditions for vapor monitoring	Five years from the date of installation of vapor monitoring
Drop tickets	12 months

FEES FOR UST OWNERS AND OPERATORS		
UST Installation Application Fee	$100 per tank	Includes the registration fee and the first year's operating permit fee. Due within seven (7) days of bringing a UST or UST system into use or assuming ownership of a regulated UST or UST system
UST Registration Late Fee	$50 per tank	Incurred if the owner fails to register within the specified timeframe
UST Annual Operating Permit Fee	$25 per tank	Required with necessary documents to renew UST Annual Operating permit. Due April 30 of each year
UST Operating Permit Late Fees	$50 per tank	Incurred if the UST Operating Permit is not renewed by April 30
	$100 per tank	Additional fee incurred if the UST Operating Permit is not renewed by August 1
FEES FOR AST OWNERS AND OPERATORS		
AST Annual Registration Fee	$10 per tank	Required with forms provided by the department for initial registration and for annual renewal. Due December 31 of each year
AST Annual Registration Late Fee	$50 per tank	Incurred if AST Annual Registration is not renewed by December 31
FEES FOR UST CONTRACTORS		
UST Contractor License	$200	Initial license valid for two years from the initial licensing date
	$100	Renewals valid for one year
UST Installer and Remover License	$100	Initial license valid for two years from the initial licensing date
	$50	Renewals valid for one year
UST Tester License	$100	Initial license valid for two years from the initial licensing date
	$50	Renewals valid for one year

Glossary

Abandon-in-place
to permanently close a UST by filling it with inert material and leaving it buried at the site.

Abatement
preliminary action taken to prevent further spread of a release and remove contaminated materials.

Aboveground release
any release to the surface of the land or to surface water. This includes, but is not limited to, releases from the aboveground portion of a UST system and aboveground releases associated with overfills and transfer operations, as the regulated substance moves to or from a UST system.

Anchoring system
equipment designed to prevent a UST from floating when the water table is high at the site by holding it in place.

Ancillary equipment
any devices including, but not limited to, piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from a UST.

Aboveground storage tank (AST)
any storage tank in which greater than 90% of the tank volume, including volume of the piping, is not below the surface of the ground; or any storage tank situated in an underground area, such as a basement, cellar, mine working, drift, shaft or tunnel, if the storage tank is situated upon or above the surface of the floor.

Automatic tank gauge (ATG)
device that monitors the level of fuel in the tank and outputs information to a console, and may also test water levels, check for releases, or alert the operator to a potential overfill.

Automatic line-leak detector
mechanical or electronic device that alerts operators to leaks, either by triggering an audible or visible alarm or by restricting the flow of product.

Automatic shutoff devices
form of overfill prevention that shuts off flow into the tank when the tank is 95% full.

Ball valves
mechanical device that prevents overfill by physically blocking the vent pipe, preventing more product from entering the tank. Ball valves are no longer an accepted form of overfill prevention.

Belowground release
any release to the subsurface of the land and to groundwater. This includes, but is not limited to, releases from the belowground portions of an underground storage tank system, and belowground releases associated with overfills and transfer operations, as the regulated substance moves to or from an underground storage tank.

Cathodic protection
technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. See also galvanic anode, impressed current, and sacrificial anode.

CERCLA
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Change-in-service
process by which an owner or operator can stop storing regulated substances in a tank and begin storing a non-regulated substance.

Class A operator
individual who has primary responsibility to operate and maintain the UST system in accordance with applicable requirements established by the department. The Class A operator typically manages resources and personnel, such as establishing work assignments, to achieve and maintain compliance with regulatory requirements.

Class B operator
individual who has day-to-day responsibility for implementing applicable regulatory requirements established by the department. The Class B operator typically implements in-field aspects of operation, maintenance, and associated record keeping for the UST system.

Class C operator
individual responsible for initially addressing emergencies presented by a spill or release from an UST system. The Class C operator typically controls or monitors dispensing or sale of regulated substances.

Compatibility
ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the UST.

Concrete deadman
anchoring system that consists of large pieces of concrete that weigh down a UST to hold it in place.

Containment sump
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.

Contractor/licensed contractor
person who has the necessary skills to perform one or more tasks related to USTs which require a license in Kansas, and has obtained a license in Kansas to do so.

Corrective action plan
plan developed in response to a release or other evidence of environmental contamination detailing remediation activities the facility intends to implement.

Corrosion
oxidation reaction between metal and other materials, typically water or acid, if present, that weakens the metal and can wear holes.

Corrosion expert
person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks, and who is accredited or certified as being qualified by the National Association of Corrosion Engineers, or a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

Corrosion protection
means of protecting metal components from water or other substances with which they might react. Accepted methods include coating with a non-corrodible material or installing a cathodic protection system.

De minimis
concentration or amount which is legally considered to be negligible.

Dispenser
equipment located aboveground that dispenses regulated substances from the UST system.

Drop ticket
bill of lading, invoice, or similar document that reflects fuel delivery by a petroleum transport company to a specific facility, and includes the deliverer’s name, delivery date, and quantity delivered.

Drop tube
tube extending from the fill port into the tank through which deliveries are made.

EPA
Environmental Protection Agency.

Excavation zone
volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the UST system is placed at the time of installation.

Facility
all contiguous land, structures, and other appurtenances and improvements on the land used in connection with one or more storage tanks.

Fill port
inlet in the spill bucket through which operators and delivery personnel can access the tank.

Financial responsibility
insurance, guarantee, surety bond, letter of credit, qualification as a self-insurer, or any other method satisfactory to the secretary to provide for taking corrective action, including cleanup and restoration of any damage to the land, air, or waters of the state; and compensating third parties for cleanup, bodily injury, or property damage resulting from a sudden or non-sudden release of a regulated substance arising from the construction, relining, ownership, or operation of an underground storage tank; and in the amount specified in the federal act.

Flow-through process tank
tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used for the storage of materials prior to their introduction into the production process, or for the storage of finished products, or by-products from the production process.

Free product
regulated substance present as a nonaqueous phase liquid (e.g., liquid not dissolved in water).

Flex connectors
small lengths of hosing used in place of joints in underground piping.

Galvanic system
form of cathodic protection that prevents corrosion by redirecting corrosive potential to a more easily corrodible material — see also sacrificial anode.

Guarantor
any person, other than an owner or operator, who provides evidence of financial responsibility for an owner or operator.

Impressed current
form of cathodic protection that prevents corrosion by delivering a continuous electrical current so the reaction does not proceed.

Intermediate sump
containment sump for piping positioned where the piping transitions from underground to aboveground.

Internal lining
lining applied to tanks that do not meet the standard for new construction to protect the tank from corrosion and help prevent releases.

Interstitial monitoring
form of release detection that monitors the space between the tank or piping, and the secondary containment for the presence of product or other evidence of a leak.

Kansas Petroleum Storage Tank Release Trust Fund
fund established by the legislature to assist owners and operators with costs related to environmental remediation of a UST site where contamination from petroleum storage tanks has occurred.

Kansas Department of Health and Environment (KDHE)
agency responsible for overseeing, managing, and enforcing state environmental regulations in Kansas.

Kansas Environmental Information Management System (KEIMS)
online data management system for facilities regulated by KDHE.

Kansas Fire Marshall's Office (KSFMO)
agency responsible for overseeing, managing, and enforcing state regulations related to fire and explosion hazards.

Manual tank gauging
technique for determining the amount of product in a tank, or the water level, using a manual gauge, commonly referred to as a stick.

Monitoring wells
wells placed throughout the excavation zone of a UST system to allow for use of vapor monitoring.

Observation tube
small wells, usually containing water, intended as an additional means to check for evidence of a release, i.e., free product present on the water in the tube.

Operator
any person in control of or having responsibility for the daily operation of a storage tank; but such term shall not include a person whose only responsibility regarding such storage tank is filling such tank with a regulated substance, and who does not dispense or have control of the dispensing of regulated substances from the storage tank.

Overfill
to supply a UST with more fuel than it can contain.

Overfill alarms
form of overfill prevention that triggers an alarm to alert the operator that the tank is nearly full.

Overfill prevention
equipment that prevents overfill of a UST by shutting off flow when the tank is 95% full, restricting flow when the tank is 90% full or 30 minutes before overfill, or sounding an alarm when the tank is 90% full or one minute before overfill.

Owner
any person who (A) is or was the owner of any underground storage tank that was in use on Nov. 8, 1984, or brought into use subsequent to that date; (B) in the case of an underground storage tank in use prior to Nov. 8, 1984, owned such tank immediately prior to the discontinuation of its use; (C) is or was the owner of any aboveground storage tank that was in use on July 1, 1992, or brought into use subsequent to that date; or (D) in the case of an aboveground storage tank in use prior to July 1, 1992, owned such tank immediately prior to the discontinuation of its use. Owner does not include (A) a person who holds an interest in a petroleum storage tank solely for financial security, unless through foreclosure or other related actions the holder of a security interest has taken possession of the storage tank; and (B) any city or county that obtains a storage tank or regulated substance as a result of tax foreclosure proceedings.

Permanent closure
process by which a UST is permanently removed from service, either by abandonment-in-place or by removal from the site.

Rectifier
device used as part of an impressed-current, cathodic protection system that converts electrical current into the form needed and displays the current activity of the system.

Regulated substance
petroleum or any element, compound, mixture, solution, or substance defined in section 101(14) of the comprehensive Environmental Response, Compensation and Liability Act of 1980 of the United States as in effect on Jan. 1, 1989, but not if regulated as a hazardous waste under the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6921 through 6939b, as in effect on Jan. 1, 1989.

Release
any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from a storage tank into groundwater, surface water, or soils.

Release detection
determining whether a release of a regulated substance has occurred from the UST system into the environment, or a leak has occurred into the interstitial space between the UST system and its secondary barrier or secondary containment around it.

Removal
process of removing or disposing of a storage tank, no longer in service, or the process of abandoning such tank in place.

Repair
to restore a tank, pipe, spill-prevention equipment, overfill-prevention equipment, corrosion-protection equipment, release-detection equipment, or other UST system component that has caused a release or a suspected release of product from the UST system, or has failed to function properly. The term includes modification or correction of a storage tank through such means as relining; replacement of piping, valves, fill pipes, vents, and liquid-level monitoring systems; and maintenance and inspection of the efficacy of cathodic protection devices. The term does not include the process of conducting a tightness test to establish the integrity of a tank.

Sacrificial anode
piece of metal more easily corrodible than the metal used to construct a tank, which is used in a galvanic cathodic protection system to prevent the tank from corroding. The sacrificial anode is oxidized over time until it is no longer effective and must be replaced.

Safe suction
suction-based piping system with a check valve positioned just below the dispenser rather than just above the tank, so that product is only present in the piping during dispensing and does not remain there any other time.

Secondary containment
release-prevention and release-detection system for a tank or piping that has an inner and outer barrier with an interstitial space that is monitored for leaks. This term includes containment sumps when used for interstitial monitoring of piping.

Septic tank
water-tight covered receptacle designed to receive or process, through liquid separation or biological digestion, sewage discharged from a building's sewer. The effluent from such receptacle is distributed for disposal through the soil, and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.

Shear valve
device that automatically closes the pipe between the tank and the dispenser when an incident such as a collision or fire causes major damage to the dispenser.

Statistical inventory reconciliation (SIR)
form of release detection that uses inventory records to determine whether there is a possibility of a leak.

Site assessment
determination of the presence or absence of petroleum contamination in areas where a release from a UST or UST system could have occurred or is suspected. This term shall include UST and UST system inspection, in addition to the collection and analysis of samples from the areas surrounding and beneath the UST and UST system.

Spill prevention control and countermeasure (SPCC)
EPA requirements regarding preparation for spills of hazardous substances, which apply to some ASTs.

Spill bucket
containment sump housing the fill port.

Spill prevention
any equipment that prevents spills of regulated substances or contains them to prevent them from spreading.

Submersible turbine pump (STP)
system that moves product from the tank to the dispenser by pressurizing the product using a pump situated on top of the tank that extends into the tank.

Tank
stationary device designed to contain an accumulation of substances, and is constructed of non-earthen materials such as concrete, steel, or plastic that provide structural support.

Tank basin
area where UST and related underground equipment are buried.

Temporary closure
process by which an owner or operator temporarily removes a tank from service for up to 12 months, with the possibility of a 12-month extension.

Temporary operating permit
short-term permit issued after installation of a tank, provided other requirements are met. Regular permits are issued once the owner or operator provides KDHE with inventory control records for the first 30 days of operation and release detection records for the first 90 days of operation.

Tightness test
testing performed on a tank or on piping to check for leaks.

Tracer compound
substance used in vapor monitoring that is easily detected and will escape into the environment during a release at least as easily as the substance stored.

Transition sump
see intermediate sump.

Under-dispenser containment (UDC)
containment underneath a dispenser system designed to prevent leaks from the dispenser and piping within or above the UDC from reaching soil or groundwater.

Ultra-low-sulfur diesel (ULSD)
diesel fuel with a sulfur content below 15ppm.

Underground release
any belowground release.

Underground storage tank (UST)
any storage tank in which 10% or more of the tank volume, including volume of the piping, is below the surface of the ground – does not include any storage tank situated in an underground area such as a basement, cellar, mine working, drift, shaft, or tunnel, if the storage tank is situated upon or above the surface of the floor.

Upgrade
addition or retrofit of some systems such as cathodic protection, lining, or spill and overfill controls, to improve the ability of an underground storage tank system to prevent the release of product.

Vapor monitoring
release-detection method that relies on monitoring the area around the tank for vapors of product or a tracer compound.

Vapor recovery (stage I)
system that reduces loss of vapor to the environment during delivery by capturing vapors and depositing them in the delivery tanker.

Vapor recovery (stage II)
system that reduces loss of vapor to the environment during dispensing by capturing vapors exiting the vehicle tank and depositing them back in the UST.

Vent line
section of pipe that allows USTs to release air or vapor during delivery and take in air during dispensing without venting the system freely.

Walk-through inspection
set of required monthly and annual tasks that can be performed by an operator rather than a contractor.