



Underground Storage Tank Sump Maintenance

An Online Continuing Education Course for Engineers

Course Number: O-1005

Credit: 1 Hour / 1 PDH / 1 CPD

Underground Storage Tank Sump Maintenance

Introduction

Despite advances that have greatly reduced the threat of petroleum releases from UST systems into the environment, some UST systems continue to experience releases. Inadequate operation and maintenance are one reason these systems continue to experience releases.

Sumps, including the sumps beneath dispensers, sumps around the submersible pump (turbine) head ¹, transition/intermediate sumps, and spill buckets are common sources of releases. Releases of even small volumes of product can seep into the ground and contaminate soil and groundwater. Inspecting and maintaining your sumps is generally simple and can prevent or minimize such releases.

While this course addresses a number of issues related to sump maintenance, it may not cover some details specific to your installation. Keep in mind the information provided in this course is not intended to replace or contradict your specific manufacturer's instructions for maintaining your sumps and the equipment in your sumps.

The average cleanup cost for a leaking UST is about \$100,000. The cost can be more than \$1,000,000 if groundwater is affected.

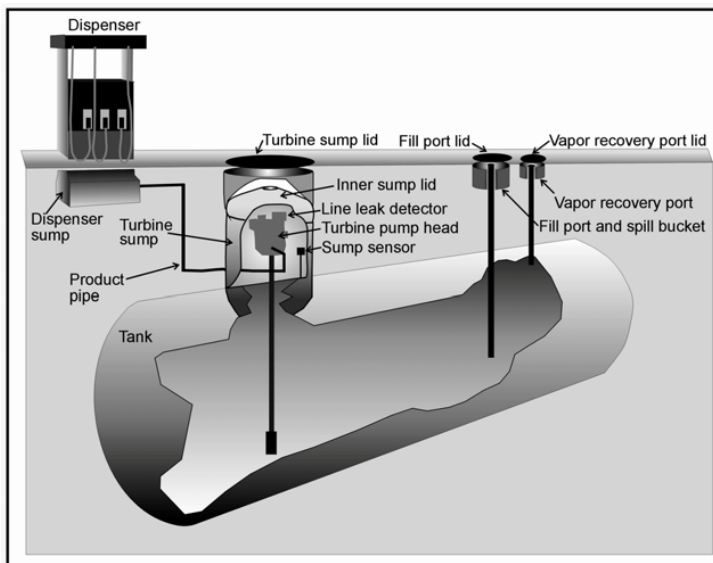


Diagram of an UST system

¹ Submersible turbine pumps are often known by their acronym STP.

Safety Considerations

If you perform sump inspection and maintenance activities, you should be experienced and aware of hazards and safety issues. Chances are you will be working in a high-traffic area, such as a gas station. You should properly mark off your work area and take appropriate steps to protect yourself. You should have the following items:

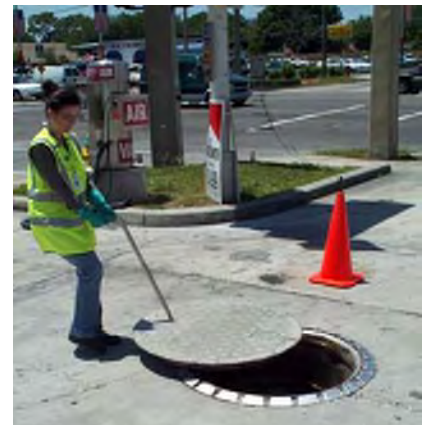
- Safety barriers, such as traffic cones or yellow plastic tape to mark off your work area
- Orange safety vest
- Hard hat (for construction sites)
- Steel-toed boots
- First-aid kit
- Chemical resistant gloves

You should consider these additional safety precautions:

- Sump lids may be large and very heavy and may require more than one person to lift. Use caution when lifting large steel lids.
- Be aware of the possibility of explosive or harmful vapors when inspecting and maintaining sumps. Avoid breathing in petroleum vapors.
- Please note that OSHA designates some sumps as confined spaces. See OSHA's standard on confined spaces in Title 29 of the *Code of Federal Regulations*, Part 1910.146.



Person wearing safety gear while inspecting a sump



Person removing a sump lid within a marked inspection area

What Is A Sump?

A sump is a subsurface area (pit) designed to provide access to equipment located below ground and, when contained, to prevent liquids from releasing into the environment.

Sumps may or may not be contained. Contained sumps have sides and a bottom, are designed to be liquid tight, and may have a special cover designed to keep out water. Uncontained sumps generally do not have a bottom and are not designed to prevent liquid from entering or exiting the sump. These sumps may use wooden or metal sheeting to restrict the slumping of soil or crushed rock onto the equipment and to prevent the surface pavement from buckling or caving.



Uncontained turbine sump

What Kinds of Sumps Are Associated With My UST System And Where Are They Located?

The types of sumps likely to be associated with your UST system are:

Turbine Sumps – Turbine sumps are designed to provide access to the turbine area above the tank. The turbine area may house the submersible turbine pump head, piping, line leak detectors, interstitial monitoring devices, wiring, and other equipment. You generally will find turbine sumps directly above your USTs. Turbine sump lids generally range from 3 to 4 feet in diameter and can be round, oval, square, or rectangular in shape.



Contained turbine sump

Dispenser Sumps – Dispenser sumps are designed to provide access to piping, flex connectors, shear valves, and other equipment located beneath the dispenser. Dispenser sumps are found directly under your dispensers.



Contained dispenser sump

Transition/Intermediate Sumps – Transition/intermediate sumps are less common than other sumps, but can be found along the piping runs that connect the tanks to the dispensers, and are designed to provide access to the piping. Transition sumps are used to transition from above-ground piping to below-ground piping or, in some cases, to transition between different types of piping. Intermediate sumps are located at key points in the piping system (e.g., low spots, branches, tees). Transition/intermediate sump lids generally range from 3 to 4 feet in diameter and can be round, oval, square, or rectangular in shape.



Transition/intermediate sump

Spill Buckets – Spill buckets are contained sumps installed at the fill and/or vapor recovery connection points to contain drips and spills of fuel that can occur during delivery. Spill buckets are located where the delivery driver connects the product and/or vapor recovery hoses to your tank. Spill buckets can be found directly above your UST, at a location that is away from your UST (remote), or both. They typically range in size from 5 to 25 gallons, and lids range from 1 to 2 feet in diameter. Spill buckets may also be installed within a larger sump, similar in construction to a turbine sump, for secondary containment. In this case, you will only need to open your smaller lids to access your spill buckets.



Spill bucket



Fill and vapor recovery lids installed within a larger sump lid

Spill Bucket Lid

Turbine Sump Lid



View of sump lids

Did You Know?

Most UST systems must have spill buckets at each fill pipe where fuel is delivered into the UST. Some facilities also have a second spill bucket around the Stage I vapor recovery line.

How Do You Access Your Sumps and Spill Buckets?

You may need tools such as a large screwdriver, pry bar, wrench, or hammer to open your sump lids. Composite lids may require a specialized tool that you probably have on site. Have someone help you in lifting large lids, as they may be very heavy. Use caution when opening the lids and be aware of the following:

- Square, rectangular, or oval sump lids can fall through the opening and damage the piping, submersible pump, or tank.
- Round lids, while not typically capable of falling into the sump, may swing down and damage the turbine head or line level indicator.
- If applicable, follow the manufacturer's recommendations for opening sump lids.
- You may need to use a spill bucket to access the dispenser.

Generally, sumps will have either direct access to the contained area.

To view the remainder of the course material and to take the quiz for PDH credit, you must purchase the course.
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Circular steel sump lid pulled back to show the inner lid covering the turbine sump



Square steel sump lid pulled up to show the inside of an uncontained turbine sump



Circular spill bucket lid pulled back to show the fill port with a spill bucket



Dispenser cover pulled off to show the dispenser piping and equipment