

# **UNDERGROUND STORAGE TANKS**

**Arizona Department of Environmental Quality**



## **UNDERGROUND STORAGE TANK PERMANENT CLOSURE GUIDANCE DOCUMENT**

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UST Coordination Unit  
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**Permanent closure** means taking an underground storage tank (UST) system out of service by first removing all accumulated liquid and sludge from the tank and either removing the UST from the ground or filling it with an inert solid material. **Change-in-Service (CIS)** means changing from storage of a regulated substance to the storage of a non-regulated substance. The permanent closure and CIS processes are governed by the Arizona Revised Statutes (A.R.S.), Title 49, Chapter 6, Article 1, Section 49-1008, and the Arizona Administrative Code (A.A.C.), Title 18, Chapter 12, Article 2, Sections R18-12-271 through 274. These citations can be found, respectively, on the Arizona State Legislature website at:

<http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=49>

and on the Arizona Secretary of State website at:

[http://www.azsos.gov/public\\_services/Title\\_18/18-12.htm](http://www.azsos.gov/public_services/Title_18/18-12.htm)

The purpose of this document is to outline the permanent tank closure and CIS procedures so that human health, safety and the environment are adequately protected and to ensure that state and federal closure and CIS regulations are followed. The associated document *UST Permanent Closure Assessment Report Form* establishes a consistent format for the submission of technical data collected during permanent tank closure and CIS activities.

The procedure for permanently closing an UST system or undergoing a CIS is as follows:

1. The UST system must be registered with the Arizona Department of Environmental Quality (ADEQ) before permanent closure or CIS activities can be initiated. Use the Notification for Underground Storage Tanks Form (Notification Form) and guidance that can be found on the ADEQ website at: [www.azdeq.gov/function/forms/appstanks.html](http://www.azdeq.gov/function/forms/appstanks.html).
2. ADEQ must be notified, in writing, of the intent to permanently close an UST or undergo a CIS at least thirty (30) days prior to the date of closure or CIS. The intent to close letter should include:
  - a. The UST owner's name, address and telephone number;
  - b. The facility name and physical street address. Also, include the ADEQ UST facility ID number, if known;
  - c. Description of each tank to be closed or undergo a CIS, including date of installation, total capacity, construction material and designated tank ID number;
  - d. The estimated date of permanent closure or CIS; and
  - e. Identification of the substance currently or last stored in each tank being closed or undergoing a CIS. For tanks undergoing a CIS, please indicate the unregulated substance that will be stored.
  - f. After receiving the intent to close letter, ADEQ will issue a closure number to the UST owner/operator and a copy to the consultant/contractor retained by the owner/operator. This

number will be valid for six months only. If closure or CIS is not accomplished within the six month period, ADEQ requires another intent to close letter be submitted.

**NOTE:** Whenever possible, the intent-to-close letter should include the name and the Arizona Department of Health Services' (ADHS) license number of the laboratory that will be performing the analytical testing. Be advised that the laboratory must be licensed to perform the analytical test methods that are approved in accordance with A.A.C. Title 9, Chapter 14, Article 6. Soil samples which are to be analyzed for the possible presence of volatile regulated substances may be subject to either: 1) Extraction within 72 hours of collection, unless site-specific pre-approval to extend the time to 120 hours has been granted by the Department; or 2) Extraction using methanol immersion; or 3) the use of purge-and-trap modified adapters. If an extension to the extraction holding time is necessary, the request should be made in the intent to close letter.

3. After receipt of the ADEQ closure number, the UST owner/operator must coordinate the permanent tank closure activity with the appropriate fire authority that has jurisdiction for the area in which the UST is located. Contacts should be made according to the following list:

	Authority Responsible for UST Closure	Coverage Areas	Telephone Number
1	State Fire Marshal	Statewide except the following cities:	602-364-1003
2	Phoenix Fire Department	City of Phoenix	602-262-6771
3	Tucson Fire Department	City of Tucson	520-791-4511
4	Arizona Department of Environmental Quality	City of Glendale, Mesa, Scottsdale and Tempe	602-771-4313

4. At the time of closure and/or before a CIS, soil samples must be taken at the locations in which contamination is observed or is most likely to occur, to determine whether there has been a release. ADEQ recommends that soil samples be collected as soon as practicable following the removal of tank and piping, but no later than four hours after removal. If a release is evident, any additional excavation and sampling must be done in accordance with all applicable state, federal, county and local regulations. The specific locations for obtaining samples are as follows:
  - a. If water is not present in the excavation at the time an UST is removed, a minimum of two (2) distinct soil samples should be taken from native soils beneath each tank that has a capacity to hold more than 550 gallons. Most samples tend to be collected in native soil two or three feet below the base of the tank basin. The samples should be taken from beneath each end of each tank. In cases where the fill pipe is located in the center of the tank, samples should be taken from beneath each end of the tank, as noted above, and an additional sample should be taken from beneath the fill pipe. If the capacity of the tank is 550 gallons or less, then one sample should be taken from native soils beneath the center of the tank.
  - b. If water is present above the floor of the excavation at the time an UST is removed, representative samples of native soils should be taken from the walls of the excavation at the soil-water interface at both ends of the tank along with a sample of the water present in the

excavation. If there is a sheen or free product on the water, the sampling requirements of this paragraph do not have to be met, but further investigation must be accomplished in accordance with all applicable state, federal, county and local regulations.

- c. If an UST is being closed in place by filling it with an inert solid material or if an UST is undergoing a CIS, a minimum of two (2) distinct soil samples must be taken from native soils as close as practicable to locations directly beneath each tank that has a capacity to hold more than 550 gallons. The samples must be taken from beneath each end of each tank. This often requires drilling angle borings. In cases where the fill pipe is located in the center of the tank, samples shall be taken from beneath each end of the tank, as noted above, and an additional sample must be taken from beneath the fill pipe. If the capacity of the tank is 550 gallons or less, then one sample must be taken from native soils as close as is practicable to a location directly beneath the center of the tank. If water is encountered during activities required by this paragraph, a sample of the water should be collected. For tanks being closed in place, ADEQ recommends that the samples required by this paragraph be collected and analyzed after notification has been provided to ADEQ but before the tanks are filled with the inert solid material.
- d. If native soil cannot be sampled due to large clast size (i.e. cobbles, boulders) or induration (granite, stiff clay, etc.) or, if the excavation zone is constructed in bedrock, samples must be taken of the excavation backfill material located beneath the UST in same manner as described in 4.a. If the backfill material cannot be sampled, contact ADEQ for further instruction.
- e. Before undergoing a CIS or after the piping has been permanently closed (i.e., flushed, then capped and closed in place or removed from the ground), distinct soil samples must be collected every twenty (20) linear feet beneath the piping in native soils. Distinct soil samples must also be collected from native soils beneath elbows, joints, fittings, dispensers, ancillary equipment and areas of corrosion. The sampling requirements of this paragraph need not be met if and only if the dispensers and all subsequent product piping are being removed from the ground and are located directly above the tank.
- f. Additional Soil Sampling: In areas that appear to have had a release, it is highly recommended that the UST owners/operators consider collecting additional soil samples below the first set of samples. By doing this, it may be possible to fully characterize the release before leaving the facility.
- g. Excavated, Stockpiled Soils: Native soils that are excavated should be stockpiled in a manner to prevent the migration of any contaminants into the air, soil or water. Discrete samples of excavated soils must be collected to determine if the soil is a special waste (A.R.S. § 49-851 et seq.).

**NOTE:** All samples must be collected and analyzed in accordance with the Sampling Guidelines set forth in Attachment A of this document.

5. Within thirty (30) days after permanent closure or a CIS, the following documents must be submitted to ADEQ:

- a. The completed *UST Permanent Closure Assessment Report Form*;
- b. Copies of the analytical test results, which must include an original chain-of-custody and laboratory Quality Assurance/Quality Control (QA/QC) information;
- c. Copies of any photographs taken during the closure or CIS activity, if available, along with a photo log identifying the date, time and subject of each picture;
- d. A site map, prepared to scale with a north arrow, that accurately depicts the locations of all pertinent site features, (i.e. tanks, piping, ancillary equipment, sampling locations, excavation(s)).

NOTE: In an effort to expedite the review process, ADEQ recommends that areas of contamination, location of stockpiled petroleum-contaminated soil, buildings, and cross streets be included on the site map indicated above.

- e. A copy of the fire authority's Closure Report (completed at the time of permanent closure); and
  - f. A revised *Notification Form* reflecting the updated status of all UST systems associated with that UST facility.
6. If at any time during the closure or CIS activity contamination is discovered or believed to exist, ADEQ must be notified within twenty-four (24) hours of discovery. The release or suspected release should be reported by calling ADEQ at (602) 771-4303 or at 1-800-234-5677, ext. 771-4303.
  7. If during the permanent closure of regulated USTs, an unregistered, previously unknown to exist tank is discovered, it is not required that ADEQ be notified at the time of discovery. Instead, the owner, operator, contractor and/or consultant should proceed with the closure of the newly discovered tank and document the closure of the tank in the UST Permanent Closure Assessment Report Form as if it was a registered tank. The requirement to register this tank with ADEQ will be satisfied when this tank is included on the Notification for Underground Storage Tanks System form that is submitted after the completion of the closure activities.
  8. All information regarding the closure or CIS of an UST system is to be submitted to:

Arizona Department of Environmental Quality  
UST & DS Section, UST Coordination Unit  
1110 West Washington Street  
Phoenix, Arizona 85007

**ATTACHMENT A**  
**SAMPLING GUIDELINES**

1. Soil Analysis: The following guidelines apply to all soil samples collected at the time of permanent closure:
  - a. All sampling equipment must be decontaminated using the procedures set forth by the American Society for Testing and Materials (ASTM) Standard D 5088-90. In addition, all soil samples must be obtained with minimal loss of volatile regulated substances and in accordance with ASTM Standard D 4547-91 and ASTM Standard D 4700-91. The Department may approve, prior to obtaining samples, other procedures for sampling which have been determined by the Department to result in analytical data representative of the concentrations and compositions of volatile regulated substances actually present in the soil.
  - b. Following permanent closure of an UST, soil samples must be collected using clean sleeves that are composed of an inert material such as Teflon, stainless steel or brass. The samples should be taken by either pushing or driving a clean split-spoon type sampler lined with sleeves into undisturbed soils or by pushing or driving the clean sleeves into the backhoe or trackhoe bucket immediately after the soil is lifted from the bottom of the excavation. The upper few inches in the bucket should be scraped aside so that fresh material near the center of the bucket may be sampled. If the material in the bucket contains too many cobbles to push the sleeve in, that soil interval is inappropriate for soil sampling for VOCs.
  - c. Discrete samples of the stockpiled excavated soil must be collected using clean sleeves composed of an inert material such as Teflon, stainless steel or brass.
  - d. Completely filled sleeves should immediately be sealed by: 1) completely covering the ends with a Teflon patch; 2) covering the Teflon patch with a foil patch; 3) covering the patches with tight fitting plastic caps; and 4) sealing the caps by wrapping custody seals or a non-contaminating tape around the sleeve, overlapping the lower edge of the cap.
  - e. The sample must be labeled immediately, placed in a sealable plastic bag, and put in a cooler on ice as set forth in ASTM Standard D 4547 and ASTM Standard D 4700-91. "Blue ice" should not be used unless required for shipping purposes.
  - f. Field measurements and the lithologic description should be conducted with the remainder of the recovered sample. ASTM Standard D 2488 or a comparable standard must be used when classifying soil lithology.
  - g. Samples collected for BTEX or VOC analysis must be extracted within 72 hours of collection, unless site-specific pre-approval has been given to extend the time limit to 120 hours. Any request for an extension to the extraction time should be received by ADEQ at least two weeks prior to the initiation of closure activities. In order to meet this requirement, the sampler should coordinate with the laboratory prior to sample submittal.
  - h. Provide copies of the laboratory results, including QA/QC information and an original, legible chain-of-custody as an attachment to this report form. Refer to ASTM Standard D 4840-99 for chain-of-custody procedures.
  - i. Compositing soil samples are not acceptable.
  - j. The regulated substance stored in the UST dictates what laboratory analyses are recommended. Table 1 shows the recommended analytical tests, based on the regulated substance stored. This table is designed to illustrate what test methods are recommended to satisfy the UST closure requirements and is not intended to address release investigation activities.

## Analytical Methods (Recommended Methods for Soil Sample Analysis)

- I. For USTs containing petroleum-based substances, ADEQ recommends screening all soil samples for total petroleum hydrocarbons (TPH) using Method 8015AZ modified for the range of hydrocarbons that is appropriate to the substances stored in the UST (e.g. gasoline range, diesel range and oil range). Samples that have reportable concentrations of TPH should further be analyzed for BTEX, VOCs, PAHs, and/or metals as specified in the table below.
- II. All samples obtained during the UST investigation may not require additional analysis. Before analyzing for specific chemicals of concern (COC) by a method listed below, prioritize the collected samples in descending order of TPH concentrations. Begin by analyzing the sample with the highest TPH first for the COCs and continue analyzing samples in descending order until the COC concentrations in a sample are below the smaller of the reporting or the regulatory limit. As testing progresses, if a sample has all COCs below the applicable limits, it is not necessary to analyze the remaining soil samples for that UST. A sample suspected of being commingled may require more than one of the tests in Table I.
- III. ADEQ may require further investigation at those locations where COCs exceed the reporting/regulatory limits.

**Table I**

Product Stored in the UST	Type of Analysis and Test Methods				
	Petroleum Hydrocarbons <sup>a</sup>	BTEX	VOCs	PAHs	Metals <sup>b</sup>
<b>Test Method</b> →	<b>8015AZ</b>	<b>8021B/8260</b>	<b>8260</b>	<b>8310</b>	
<b>Products</b>					
Gasoline/Oxygenated Gasoline/Ethanol blended Gasoline	X	X			
Diesel/Biodiesel	X			X	
Jet Fuel	X	X			
Used Oil	X		X	X	X
New oil/Heating Oil	X			X	
Kerosene	X			X	
Solvents <sup>c</sup>			X		
Hazardous Substance <sup>d</sup>	See Below				
Unknown	X		X	X	X
BTEX = Benzene, toluene, ethylbenzene, xylenes ♦ VOCs = Volatile organic compounds ♦ PAHs = polyaromatic hydrocarbons					
<sup>a</sup> You may use the 8015AZ test method as a screening tool. If a soil sample contains concentrations of hydrocarbons greater than the laboratory reporting limit, contact ADEQ at (602) 771- 4303 and report a suspected release.					
<sup>b</sup> Metals to be analyzed are: arsenic, cadmium, chromium (total), lead and mercury. Use EPA methods 6000 and 7000 series for the analyses. Make a due diligent effort to obtain the background levels of the metals analyzed for comparison.					
<sup>c</sup> Contact ADEQ UST call line at (602) 771-4303 or an analytical laboratory for guidance on appropriate test methods for particular semi-volatile solvents of concern.					
<sup>d</sup> Analyze for compounds specific to the hazardous substance released.					

**Water Analysis:** All water samples must be analyzed in accordance with the Arizona Administrative Code Title 9, Chapter 14, Article 6.