



Revised May 2019

The following Underground Storage Tank (UST) Closure Assessment Guidelines supersede the original guidelines effective July 21, 1992 (revised last in February 2014). These guidelines are intended to assist the UST facility owners/operators and their consultants in complying with Rule 1.15(D)(10) of the RIDEM's "RULES AND REGULATIONS FOR UNDERGROUND STORAGE FACILITIES USED FOR REGULATED SUBSTANCES AND HAZARDOUS MATERIALS" (DEM, 250-RICR-140-25-1) or **UST Regulations**.

Which USTs are subject to closure assessments?

As specified in Rule 1.15(A) of the **UST regulations**, not all UST facilities must perform assessments. In general, preparing an assessment report is mandatory when tanks storing the following types of materials are closed:

- Gasoline or Diesel
- Heating Oil when the oil is not consumed entirely on-site, e.g. transported off-site.
- Hazardous Materials
- Waste Oils
- Jet Fuels & Aviation Gas
- Lubricating and Cutting Oils



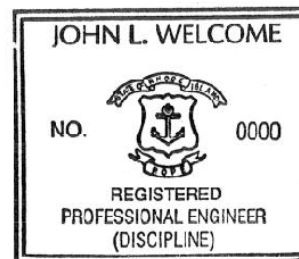
The following facilities are exempt from the mandatory closure assessment requirements:

- USTs storing heating oils consumed on-site.
- Farm/residential motor fuel tanks of less than 1,100 gallons of capacity consumed solely on-site.

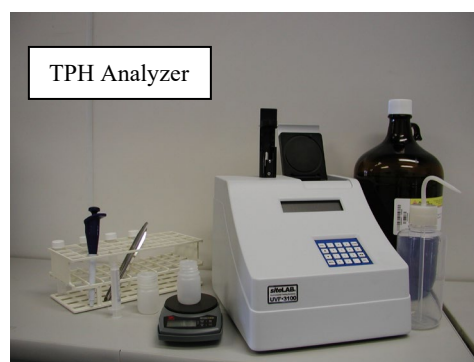
Please note, however, that DEM may require an assessment at any exempted facility if there are conditions which indicate a possible leak or release has occurred. When a release is discovered during a tank closure, Rule 1.14 of the **UST Regulations** ("Leak and Spill Response") is applicable. When a DEM representative is present during the tank closure and a closure assessment is performed, a separate "Release Characterization Report" in accordance with Rule 1.14(G) of the **UST Regulations** is not required.

Who performs the assessment?

The facility owner/operator is required to make arrangements (e.g. retain consultants) to ensure an adequate closure assessment is performed. Assessments must be carried out by persons of appropriate professional qualifications and be employed by a firm independent of the UST facility owner. In general, DEM will consider that registered professional engineers (civil, environmental, and chemical) or certified professional geologists, or registered professional geologists have the appropriate level of training and expertise to supervise the preparation and interpretation of a closure assessment report.



Field activities during a closure assessment may be carried out by other qualified persons provided that the final assessment report is reviewed and attested to by a qualified professional. The environmental professional performing the closure assessment must have all the appropriate equipment such as soil screening instruments, sampling jars, gloves, camera, etc. and demonstrate the ability to use this field equipment in a proper manner. DEM will not approve assessments prepared by persons who fail to demonstrate to DEM they possess the necessary education, training, and experience to be able to conduct the assessment and interpret the results in an accurate and valid manner. Additionally, the environmental professional performing the closure assessment must be on site during all soil excavation, tank cleaning and lifting, contaminated soil excavation, etc. The consultant is not required to be present during initial preparatory work such as pavement removal, pump and island removal, etc. or backfilling of the tank grave.



What has to be done to complete the assessment?

The goal of any closure assessment is to determine if a leak or release from the UST system has occurred. This is done by measuring for potential releases from the UST system in locations at which releases would most likely occur. In addition, a proper assessment makes use of all readily available and pertinent information for the site, including background information on leak detection. The results of the closure assessment must be submitted to DEM in a written report format.

Contents of the Closure Assessment:

- (1) Background description of the site: location, use of facility, etc., and summary of leak detection results where available. Include a detailed diagram of the site showing location of removed tank(s), pump(s), lines, buildings, monitoring wells, locations of soil screening and sampling, and other pertinent site features.
- (2) Description of the closure actions taken, e.g. number, size, construction type and stored material of USTs closed. Include a brief description of closure method including final deposition of the tanks and any wastes generated by tank cleaning operations. Discrepancies between information contained on the original application form and that gained during the actual closure should be explained and clarified. For example, often times the sizes and materials stored in USTs are different than what was originally presumed. Copies of manifests generated for the site should be included in the closure assessment report.
- (3) Description of the condition of each tank removed or closed. Including the extent of corrosion and presence of holes in the tank or piping. Describe the conditions of piping/tank connections. This may require that compacted soils be removed from the tank prior to a visual inspection. A photograph documenting the condition of each removed UST is required.
- (4) Description of the soil conditions in and surrounding the UST system excavation. Including soil types, gradation (where applicable), extent of compaction and any other notable physical characteristics. The soil classification system used to describe the soil must be stated in the closure assessment.
- (5) Description of soil conditions relative to contamination with petroleum products or hazardous materials. The quality of the soils must be assessed by field or analytical sampling methods in several locations throughout the excavation area. Field screening instruments such as the photo-ionization detector (PID) or the flame ionization detector (FID) may be used at sites with USTs used to store gasoline, diesel and #2 fuel oil. A standard operating procedure, documentation of calibration of field equipment shall be made available to the DEM inspector on request and must be included in the closure assessment report. The use of a PID to screen soils for heavier petroleum products is not appropriate.



At a minimum, soil samples must be taken from the following specific locations and screened for the presence of contamination:

- Sidewalls: five foot intervals at elevation equal to tank center
- Lines: dispensary and remote fill lines at five foot intervals
- Pump island: at five foot intervals
- Fill pipe: from grade to top of tank and along tank sides at fill end
- Tank bottom: along centerline according to length of tank:
 - Less than 6 feet: one soil sample at tank center
 - 6 feet to 12 feet: one soil sample at each end
 - 12 feet + to 20 feet: one soil sample at each end and one at tank center
 - Greater than 20 feet: one soil sample every five feet along centerline

Additional soil screening is to be done in areas where leaks are apparent.

All of the soil screening results from the sidewalls, tank bottom, lines, pump island and fill pipe are to be recorded and tabulated in the closure assessment report.

When a release is observed during the tank closure, the Department must to be notified. See the "Release Notification" section below of these guidelines.

- (6) Description of the presence of groundwater at the site, including the distance between the tank bottom and the groundwater table. Depth to the water table shall be noted where encountered. Also describe the quality of groundwater based on visual and field screening observation methods and, where appropriate, laboratory analysis of water samples. The presence of any sheen or amount of free product shall be noted. Additional actions pertaining to free product are contained in Rule 12.00 of the UST Regulations. During excavation an attempt to reach the groundwater table shall be made. The reach of the backhoe is considered the acceptable limit of this excavation effort. If groundwater monitoring wells are present, they should be gauged for the depth to groundwater and for the presence of free product.
- (7) All soil and water samples should be collected and handled according to proper chain of custody requirements and accepted sampling protocols. With the report, documentation of chain of custody and adherence to appropriate quality control and quality assurance measures shall be provided. Samples must be analyzed at laboratories approved by the State of Rhode Island, or if located out of state, approved by the appropriate regulatory entity in that jurisdiction.
- (8) For sites located in the wellhead protection areas of community wells and non-transient non-community wells, as designated by DEM, samples of the groundwater at the site are mandatory, unless the requirement is waived by the DEM representative.
- (9) Include identification of the groundwater classification for the site and surrounding area and

characterize the use of groundwater resources in the site vicinity; e.g. private wells are in use nearby. The groundwater classification shall be considered by DEM in decisions regarding the extent of soil removal and/or other remedial efforts to be undertaken at the site.

- (10) If contamination is identified on the site, note any other receptors, e.g. private wells, surface waters, storm drains, basements, which may be affected. Receptors should be evaluated to the extent feasible for indications of a release.
- (11) Findings and Conclusions: The closure assessment report must include a finding as to whether or not a release has or is likely to have occurred and caused contamination of the environment. It is the responsibility of the professional writing the report to clearly make this conclusion.

Information such as depth to groundwater, soil type, soil screening and laboratory analytical results, etc. should be used in making this conclusion. Laboratory analytical results of any soil samples taken during the tank closure may be compared to the Leachability Criteria listed in Table Two of these guidelines. When the results of the closure assessment indicate that groundwater has or likely has been impacted by a release, a Site Investigation in accordance with Rule 1.14(H) of the **UST Regulations** should be recommended.

It is not necessary in this report to characterize the full extent of any significant contamination found during the closure process since such sites will be expected to proceed pursuant to Rule 1.14 of the **UST Regulations** (“Leak and Spill Response”), to conduct a full site assessment/investigation.

The closure assessment shall include recommendations for further action, where necessary. If no further action is required, it must be clearly stated in the report.

A “UST Closure Assessment Report Checklist” (access at: <http://www.dem.ri.gov/programs/benviron/waste/pdf/clsrchk.pdf>) shall be completed and included with the submission of a UST Closure Assessment Report.



Release Notification

If contamination is observed visually or by field screening methods during the tank closure, the DEM UST Management Program is to be notified immediately by telephone. A representative from the UST Management Program will determine if additional action is needed during the tank closure such as contaminated soil excavation, laboratory analysis of soil samples, and other release response actions in accordance with Rule 1.14 of the **UST**

Regulations. When soil samples are required to be taken for laboratory analysis, the EPA methodology listed in Table 1 of these guidelines must be used.

NOTE: When using a PID or FID, the following criteria is to be used as the threshold for release reporting and to separate contaminated soil for offsite disposal from soil which may be reused onsite as tank grave backfill:

GA/GAA Groundwater:	20 ppm
GB Groundwater:	40 ppm

These numbers are not meant to show a site is clean, or in compliance with other regulations. They are a screening indicator to show that the material does not necessarily have to be managed at an offsite licensed facility.

When is the closure assessment report due?

Closure assessment reports are due to DEM no later than 30 days following the closure. Additional time may be requested in writing if special circumstances warrant an extension.

What happens after the assessment is submitted?

DEM will review closure assessments to insure that they meet these guidelines and the revised state UST regulations. Again, the goal of the assessment is to identify whether contaminants which are associated with the UST systems are present at the site. Following its review, DEM will either accept or reject the submitted assessment. Deficiencies in the rejected assessments will be noted and required to be corrected by the owner/operator.

Final certificates of closure will not be issued until the closure assessment is approved. If a release has occurred, the issuance of the closure certificate may be subject to additional requirements such as site investigation, site monitoring, or site remediation.

Leo Hellested, P.E.
Chief, Office of Waste Management

NOTE: These guidelines are subject to change. DEM will maintain a mailing list of firms doing business in this area which would like to be notified when subsequent policies and/or guidelines are issued. To place your firm on the mailing list, call the UST Management Program at (401) 222-2797. For more information contact:

**Department of Environmental Management
Office of Waste Management
Underground Storage Tank Management Program
235 Promenade Street
Providence, RI 02908**

TEL (401) 222-2797

FAX (401) 222-3813

TDD 771

TABLE ONE

SOIL SAMPLE ANALYSIS

The following EPA Methods are to be used when soil samples are required to be taken and laboratory analyzed during tank closure:

<u>TANK CONTENT</u>	<u>EPA METHOD</u>
Gasoline	8260B (& MTBE) VOCs
Mineral Spirits	TPH-8015(M)
JP-4	8260B VOCs
Kerosene	TPH-8015(M) or TPH-8100(M)
Jet A	TPH-8015(M) or TPH-8100(M)
JP-5	TPH-8015(M) or TPH-8100(M)
Diesel	TPH-8100(M)
#2 Fuel Oil	TPH-8100(M)
#4 Fuel Oil	TPH-8100(M)
#5 Fuel Oil	TPH-8100(M)
#6 Fuel Oil	TPH-8100(M)
Lubricating Oil	TPH-8100(M)
Waste Oil*	TPH-8100(M)

Refer to Environmental Protection Agency Document SW-846 "Test Methods for Evaluating Solid Waste" for the latest revisions which must be used.

* A soil sample is required to be taken and laboratory analyzed during the closure of a waste oil tank. The required method to be used is 8100 Modified for total petroleum hydrocarbons. When a release is observed from a waste oil tank, the soil must also be analyzed for volatile organic compounds using EPA Method 8260B.

Other analyses may be required for tanks containing products other than those listed above.

TPH 8015(M) - or equivalent volatile "purge and trap", GC method

TPH 8100(M) - or equivalent extractable GC method

TABLE TWO

SOIL LEACHABILITY CRITERIA

Contaminant	GA Leachability (mg/kg)	GB Leachability (mg/kg)
Volatile Organics		
Benzene	0.2	4.3
Carbon tetrachloride	0.4	5
Chlorobenzene	3.2	100
1,2-Dichloroethane	0.1	2.3
1,1-Dichloroethene	0.7	0.7
cis-1,2-Dichloroethene	1.7	60
Trans-1,2-Dichloroethene	3.3	92
1,2-Dichloropropane	0.1	70
Ethylbenzene	27	62
Ethylene dibromide (EDB)	5.00E-04	*
Methyl-tertiary-butyl-ether (MTBE)	0.9	100
Styrene	2.9	64
Tetrachloroethene	0.1	4.2
Toluene	32	54
1,1,1-Trichloroethane	11	160
1,1,2-Trichloroethane	0.1	*
Trichloroethene	0.2	20
Vinyl chloride	0.3	*
Xylenes	540	*
Semivolatiles		
Benzo(a)pyrene	240	*
Dichlorobenzene (all isomers)	41	*
Diethylhexyl phthalate	120	*
Napthalene	0.8	*
Pentachlorophenol	7.1	*
1,2,4-Trichlorobenzene	140	*

* Soil leachability criteria not established for this contaminant. The above soil leachability criteria are from the RIDEM's "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases" (DEM, 250-RICR-140-30-1).

TOTAL PETROLEUM HYDROCARBON LEACHABILITY CRITERIA

GA GROUNDWATER CLASSIFICATION : 500 ppm
GB GROUNDWATER CLASSIFICATION : 2500 ppm

Appendix I