



**DIVISION OF UNDERGROUND STORAGE TANKS
TECHNICAL GUIDANCE DOCUMENT - 011**

**EFFECTIVE DATE - AUGUST 30, 1991
REVISED DATE - AUGUST 1, 1996
REVISED DATE - AUGUST 30, 1998
RESCINDED - JULY 1, 2005**

**RE: PROCEDURES TO DETERMINE THE APPLICABLE SOIL AND GROUND
WATER CLEANUP LEVELS DURING AN UNDERGROUND STORAGE TANK
(UST) SYSTEM CLOSURE**

The purpose of this Technical Guidance Document (TGD) is to determine the applicable soil and/or ground water cleanup levels during an UST system closure or as directed by the Division. During a routine closure, this TGD is applicable after sampling and analysis have been performed following the *UST System Closure Assessment Guidelines*.

The analytical data collected during sampling will dictate which sections of this TGD are to be followed:

1. If soil contamination is between 5 PPM and 100 PPM benzene and/or 100 PPM and 1,000 PPM TPH **and no** ground water was encountered, then Sections I and III of this TGD shall be followed.
2. If soil contamination is between 5 PPM and 100 PPM benzene and/or 100 PPM and 1,000 PPM TPH and ground water was encountered and if ground water contamination is between 0.005 PPM and 0.070 PPM benzene and/or 0.100 PPM and 1.0 PPM TPH, then Sections I, II and III of this TGD shall be followed.
3. If no soil contamination is found, but ground water contamination is between 0.005 PPM and 0.070 PPM benzene and/or 0.100 PPM and 1.0 PPM TPH, then Sections I, II and III of this TGD shall be followed.

If contaminant levels are above the ranges specified above, then the Responsible Party shall proceed with an environmental assessment per the Environmental Assessment Guidelines. If site-specific conditions warrant variations from this guidance document, then Division personnel in the appropriate Environmental Assistance Center shall be informed and permission shall be obtained prior to the implementation of these variations.

If any of the following conditions exist or have existed, then this TGD cannot be applied:

1. The conditions of the site present vapor or explosion hazards. For the purpose of this TGD, the presence of any detectable levels of petroleum vapors in an enclosed space shall constitute a vapor or explosion hazard;
2. Ground water and/or surface water contamination above 0.07 PPM benzene and/or 1.0 PPM TPH;

3. Soil contamination above the most stringent cleanup level at the soil / bedrock interface;
- or
4. The UST system is installed in bedrock.

Additional requirements:

- A. This TGD can only be used during an UST system closure or as directed by the Division.
- B. If at any time during the site work ground water or surface water is found to contain concentrations greater than 0.07 PPM benzene or 1.0 PPM TPH, then an environmental assessment shall be required.
- C. A registered geologist or registered professional geologist under the Tennessee Geologist Act (T.C.A. 62-36-101 et seq.), or registered professional engineer under the Tennessee Architects, Engineers, and Landscape Architects, and Interior Designers Law and Rules (T.C.A. 62-2-101 et seq.) shall be retained to perform all work specified in this TGD.
- D. An UST approved Corrective Action Contractor shall conduct and oversee all work associated with the investigation and remediation of a release from the UST system if a site is fund eligible and reimbursement will be requested from the Tennessee Petroleum Underground Storage Tank Fund.
- E. Laboratory Method 4030 shall **not** be used when using this TGD.

I. PROCEDURE TO DETERMINE APPLICABLE SOIL CLEANUP LEVELS

A. WATER USE SURVEY

The Water Use Survey shall be performed in accordance with the current Environmental Assessment Guidelines to determine if ground water is being used for drinking water. If the citizens of the state are using any impacted aquifer or water source, then the aquifer or water source shall be classified as a “drinking water supply”. If water is not encountered during closure of the UST system and is not a drinking water supply as determined in the water use survey, then it may be classified as a “non-drinking water supply”.

B. PROCEDURE TO DETERMINE SOIL PROPERTIES

The following sub-sections in the current Environmental Assessment Guidelines - *Soil Investigation Procedures* shall be followed when installing the soil borings and collecting shelly tube samples:

- Boring Methods
- Soil Properties Analysis
- Borehole Abandonment
- Decontamination Procedures

Two soil borings shall be placed within 10 feet of the edge of the tank excavation in the anticipated downgradient direction. Two undisturbed soil samples (shelby tubes) shall be collected in the unsaturated zone.

Based on the soil characteristics observed in Boring 1, two (2) soil samples shall be collected from Boring 2 for permeability testing. The first shelby tube shall be collected at the depth, which represents the zone of highest permeability. The second shelby tube shall be collected immediately above the soil/bedrock interface or the water table, whichever occurs first. OVD readings or other field screening techniques shall be used to establish the presence of soil contamination at depth in Boring 2. If the OVD readings and other field screening techniques (visual or olfactory) indicate that contamination does not exist in the soil boring, and if the bedrock interface or ground water is not encountered within forty feet of the bottom of the tank hold, then the boring may be terminated and a second shelby tube shall be collected at the depth where the second highest permeability would be expected. If OVD or field screening techniques indicated contamination is present at depth, then the sample with the highest OVD reading shall be collected and analyzed for the applicable petroleum constituents in accordance with the Environmental Assessment Guidelines.

II. PROCEDURE TO DETERMINE APPLICABLE GROUND WATER CLEANUP LEVELS

A. WATER ENCOUNTERED IN TANK PIT

Water in the tank pit shall be pumped. If water recharges within 24 hours, a ground water sample shall be collected and analyzed in accordance with the current Closure Assessment Guidelines. If 500 gallons of water have been removed or the removal does not effect the water level in the tank pit, then contact Division personnel in the appropriate Environmental Assistance Center for further instructions. All water shall be managed in a manner such that it will not cause pollution and shall be disposed in accordance with all applicable State and Federal Laws.

1. If ground water analytical results are between 0.005 parts per million (PPM) and 0.070 PPM benzene and/or 0.100 PPM and 1.0 PPM TPH, then a water use survey shall be performed as described in the current Environmental Assessment Guidelines (EAG).
2. If the Water Use Survey classifies the aquifer or water source as a drinking water supply and the ground water analytical results are greater than 0.005 PPM benzene and/or 0.10 PPM TPH, then an environmental assessment shall be done per the EAG.
3. If the Water Use Survey does not identify any drinking water supplies, then it shall be determined if the water source meets the primary and secondary drinking water standards of Rule 1200-5-1.b. A ground water monitoring well shall be installed immediately adjacent to the area of suspected contamination in the apparent downgradient direction following the current Environmental Assessment Guidelines. The monitoring well shall be sampled and analyzed for the applicable petroleum constituents and primary and secondary drinking water parameters in accordance with the Environmental Assessment Guidelines.

- a. If the water source fails to meet the primary or secondary standards specified in the current Environmental Assessment Guidelines and is not a drinking water supply as determined in the water use survey, then it may be classified as a “non-drinking water supply”.
- b. If the ground water meets the criteria of the primary and secondary drinking water standards specified in the current Environmental Assessment Guidelines, then the yield of the aquifer or water supply shall be determined as described in the current Environmental Assessment Guidelines. If the aquifer or water source is not able to produce water at the rate of one-half gallon per minute and is not a drinking water supply as determined in the water use survey, then it may be classified as a “non-drinking water supply”. If the aquifer or water source is able to produce water at the rate of one-half gallon per minute and is a drinking water supply as determined in the water use survey, then it shall be classified as a “drinking water supply” and the site shall go into assessment following the Environmental Assessment Guidelines.

B. WATER ENCOUNTERED IN PERMEABILITY BORING

If ground water is encountered in the permeability borings, then a ground water monitoring well shall be installed immediately adjacent to the area of suspected contamination in the apparent downgradient direction following the current Environmental Assessment Guidelines. The monitoring well shall be sampled and analyzed for the applicable petroleum constituents in accordance with the Environmental Assessment Guidelines.

If ground water analytical results are between 0.005 parts per million (PPM) and 0.070 PPM benzene and/or 0.100 PPM and 1.0 PPM TPH, then a water use survey shall be performed as described in the current Environmental Assessment Guidelines. The ground water shall be sampled and analyzed following the current Environmental Assessment Guidelines to determine if the water source meets the primary and secondary drinking water standards of Rule 1200-5-1.

1. If the aquifer or water source fails to meet the primary or secondary standards specified in the current Environmental Assessment Guidelines and is not a drinking water supply as determined in the water use survey, then it may be classified as a “non-drinking water supply”.
2. If the ground water meets the criteria of the primary and secondary drinking water standards specified in the current Environmental Assessment Guidelines, then the yield of the aquifer or water supply shall be determined as described in the current Environmental Assessment Guidelines. If the aquifer or water source is not able to produce water at the rate of one-half gallon per minute and is not a drinking water supply as determined in the water use survey, then it may be classified as a “non-drinking water supply”. If the aquifer or water source is able to produce water at the rate of one-half gallon per minute and is a drinking water supply as determined in the water use survey, then it shall be classified as a “drinking water supply” and the site shall go into assessment following the Environmental Assessment Guidelines.

III. REPORT

After the applicable cleanup levels for soil and ground water have been determined, a report including the following information shall be submitted to the Division.

- A.
 - 1. Facility ID # _-_-_-_-_-
 - 2. Facility Name:
 - 3. Date release confirmed:
 - 4. Date release reported:
- B. Site Location
 - 1. Provide a vicinity map showing the site location and adjacent properties.
 - 2. Provide a site map, drawn to scale, including the following:
 - a. The location of the tank(s), lines, and dispenser island(s). If these have been removed, indicate the former location by using a dashed line.
 - b. The location of all underground utilities (i.e. gas, water, sewer, etc.).
 - c. The location of the soil borings and/or monitoring well.
- C. Submit all water, ground water and soil laboratory results. The original or a carbon copy of the laboratory analysis sheet shall be submitted to the Division. Photocopies are not acceptable. All laboratory analysis sheets shall include the information specified in the *UST System Closure Assessment Guidelines*.
- D. Results of the Water Use Survey
 - i. Provide a color topographic map showing the location of all drinking water supplies (wells and springs) within a one-half (0.5) mile radius of the UST site. The topographic map shall depict the one-tenth (0.1) and one-half (0.5) mile radii from the UST site. If drinking water supplies are adjacent to the UST site, provide a vicinity map showing the locations.
 - ii. Provide the laboratory analytical sheets from all sampling events of drinking water supplies.
 - iii. Provide the completed Water Use Survey form(s) for all properties within one-tenth (0.1) mile.
 - iv. Provide the completed Water Use Survey form(s) for all water supplies (wells and springs) identified within a one-half (0.5) mile radius of the UST site.
 - v. Provide the Water Well Survey computer printout from the Division of Water Supply for any wells identified within a one-half (0.5) mile radius from the UST site.

E. Results of Soil Properties Testing (if applicable)

1. Describe the method used to drill and sample the soil borings.
2. Submit boring logs for the soil borings in accordance with TGD-006.
3. Include the depths at which the undisturbed soil samples (shelby tubes) were collected.
4. Identify the laboratory methods used to determine the soil properties.
5. Include the laboratory soil property results as specified in the current Environmental Assessment Guidelines. The original or a carbon copy of the laboratory analysis sheet shall be submitted to the Division. Photocopies are not acceptable. All laboratory analysis sheets shall include the information specified in the *Environmental Assessment Guidelines*.

F. List the applicable ground water cleanup level based on the following table (Appendix 4, UST Regulations):

| | <u>BENZENE LEVEL</u> | TOTAL PETROLEUM HYDROCARBON |
|--------------------|----------------------|--------------------------------|
| DRINKING WATER | 0.005 PPM | 0.100 PPM |
| NON-DRINKING WATER | 0.070 PPM | 1.0 PPM |

G. List the applicable soil cleanup level based on the following tables (Appendix 5, UST Regulations):

| <u>Soil Cleanup Level</u> | <u>Benzene Level PPM</u> | | |
|---------------------------|-----------------------------------|--|-----------------------------------|
| | <u>>10⁻⁴ cm/sec</u> | <u>10⁻⁴ to 10⁻⁶ cm/sec</u> | <u><10⁻⁶ cm/sec</u> |
| Drinking Water | 5 | 25 | 50 |
| Non-Drinking Water | 25 | 50 | 100 |

OR

| <u>Soil Cleanup Level</u> | <u>TPH Level PPM</u> | | |
|---------------------------|------------------------------------|--|-----------------------------------|
| | <u>> 10⁻⁴ cm/sec</u> | <u>10⁻⁴ to 10⁻⁶ cm/sec</u> | <u><10⁻⁶ cm/sec</u> |
| Drinking Water | 100 | 250 | 500 |
| Non-Drinking | 250 | 500 | 1000 |

H. A completed Signature Page shall be included in the report.

Signature Page

A signature page, as shown below shall be attached to the report. The page shall be signed by the RP (or authorized representative within the organization) and a registered professional geologist under the Tennessee Geologist Act (T.C.A. 62-36-101 et seq.), or registered professional engineer under the Tennessee Architects, Engineers, and Landscape Architects, and Interior Designers Law and Rule (T.C.A. 62-2-101 et seq.).

We, the undersigned, certify under the penalty of law, including but not limited to penalties for perjury, that the information contained in this form and on any attachments is true, accurate and complete to the best of our knowledge, information and belief. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violations.

Signature Page

UST System RP or RP's authorized
representative (Print name)

Signature

Date

Title (Print)

PE or PG (Print name)

Signature

Date

TN Registration #

Note: Each of the above signatures shall be notarized separately with the following statement.

STATE OF _____ COUNTY OF _____

Sworn to and subscribed before me by _____ on this date _____.
My commission expires _____.

Notary Public (Print Name)

Signature

Date

Stamp/Seal